COLLEGE OF DEVELOPMENT STUDIES

CENTER FOR FOOD SECURITY STUDIES

HOUSEHOLD MULTIDIMENSIONAL POVERTY ANALYSIS IN NON-CAPITAL TOWNS OF GULOMEKADA *WOREDA*, TIGRAY REGION, NORTHERN ETHIOPIA

BY

TIBLETS FETSUM

JUNE 2018

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MSC THESIS SUBMITTED TO COLLEGE OF DEVELOPMENT STUDIES CENTER FOR FOOD SECURITY STUDIES

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ADDIS ABABA

DECLARATION

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

Declared By: Tiblets Fetsum Girmay

Signature: _____

Date: _____

Place: Addis Ababa University College of Development Studies, Center for Food Security Studies, Addis Ababa

This is to certify that the above declaration made by the candidate is correct to the best of my knowledge as an advisor.

Dr. Messay Mulugeta _____ _____
(Advisor) Signature Date

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

This is to certify that the thesis prepared by Tiblets Fetsum Girmay entitled '*Household Multidimensional Poverty Analysis in Non-capital Towns of Gulomekada Woreda, Tigray Region, Northern Ethiopia'* and submitted in partial fulfillment of the requirements for the Degree of Master of Science in Food Security and Development complies with the regulations of Addis Ababa University and meets the accepted standards with respect to originality and quality.

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Abbreviations and Acronyms

AF:	Alkire-Foster
CSA:	Central Statistical Agency
FAO:	Food and Agriculture Organization of the United Nations
GTP	Growth and Transformation Plan
GWAO	Gulomekada Wo*reda* Agricultural Office
HDI:	Human Development Index
HICES:	Household Income Consumption Expenditure Survey
HPI:	Human Poverty Index
KII:	Key informant Interview
MDP:	Multidimensional Poverty
MoFED:	Ministry of Finance and Economic Development
MoWR	Ministry of Water and Resource
MPI:	Multidimensional Poverty Index
MUDC:	Ministry of Urban Development and Construction
MYSC	Ministry of Youth, Sports and Culture of Ethiopia
NCT:	Non-Capital Town
NGO:	Non-Governmental Organization
NMA:	National Meteorological Agency
NPC:	National Plan Commission
OPHI:	Oxford Poverty and Human Development Initiative
PASDEP:	Plan for Accelerated and Sustained Development to End Poverty
PPP:	Purchasing Power Parity
SDG:	Sustainable Development Goal
SDPRP:	Sustainable Development and Poverty Reduction Program
UNDP:	United Nations Development Programme
WMS:	Welfare Monetary Survey

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Abstract

The study was carried out in non-capital towns of Gulomekada woreda which is found in Tigray National Regional State with the main objective of investigating extent and determinants of multidimensional poverty in Zalambesa and Sebeya towns. To attain the aforementioned objective, cross-sectional survey design was employed. The, primary data was collected from 210 randomly selected sample households by proportionally allocating to both towns using survey questionnaire. In addition, key informant interview and observation were employed to generate qualitative data from the selected primary sources. Descriptive analysis was used to analyze the extent of multidimensional poverty and binary logistic regression was employed to look into determinants of household multidimensional poverty. Alkire-Foster (AF method) was used to analyze the multidimensional poverty by using three dimensions and eleven indicators. Accordingly, incidence, intensity, multidimensional poverty index (MPI), raw headcount ratio, censored headcount ratio and contribution of each poverty indicators to the poor people were computed. The result revealed that the extent of overall multidimensional poor was 31.4% of the sample households' with the intensity and MPI of 46.4% and 15% respectively. From the selected indicators, year of schooling (32.5%), and illness/ disability and morbidity/ (23.9%) were the highest contributors to the overall poverty incidence in the towns. The result of Binary logistic regression model revealed that family size, addiction, health problem, expenditure on health and person per room (crowdedness) were statistically significant determinants for the household multidimensional poverty. Based on the major findings, enhancing economic performances of the community and strengthening access to education are recommended. In addition to this, disease prevention endeavor is one of the vibrant recommendations to alleviate the poverty status of the community.

Keywords: *Non-capital town, multidimensional poverty, Gulomekada, Tigray, Ethiopia*

CHAPTER I: INTRODUCTION

1.1. Background of the study

Poverty is usually defined as deprivations in well-being resulting in an inability to meet the basic needs of the individual or family including food, shelter, clothing, water and sanitation, education, and healthcare (World Bank, 2000 and Tsegaye, 2014). Similarly, Sen (1999) defined poverty as deprivations in basic capabilities of the individual or family. Poverty is a lack of well-being covering both monetary and non-monetary aspects. As indicated in Sen (1992), poverty is not the mere lack of income to meet basic needs but deprivations in basic human capabilities such as achievement in education, health, malnutrition and self-respect in society.

In recent years, there has been a growing consensus regarding the insufficiency of income poverty measures (Sen, 1992). In the uni-dimensional income space, who is poor is identified by determining an income poverty line which is the level of income necessary to purchase a basic basket of goods and services that dichotomizes the population into the poor and the non-poor (Alkire and Santos, 2014). The poverty line captures the monetary aspect of poverty but cannot accurately reflect the non-monetary aspects. Particularly, the food poverty line is usually based on the market price of 2100 calories per person per day (Wang, *et al*., 2009).

Increasing poor people's basic capabilities through education and health care will increase their productivity and income (Sen, 1999). Therefore, it is argued that multidimensional poverty measurement based on basic capability can more accurately reflect the real circumstances of poverty and the measurement of poverty (Alkire and Foster, 2007/2011). Multidimensional poverty is made up of several factors that constitute poor people's experience of deprivation such as poor health, lack of education, inadequate living standard, lack of income (as one of several factors considered) and disempowerment. In multidimensional poverty measurement, different poverty indicators can be chosen appropriate to the society and situation (Swaminathan, *et. al.*, 2013).

Regardless of the way of poverty measurements whether income (one-dimensional) or multidimensional, poverty continues to become one of the most worrying economic and social problems in the twenty first century (Shugri, 2016). Similarly, FAO (2012) has stated poverty as

worldwide social evil still now in the 21st century. In addition to this, Shugri (2016) indicated that worldwide, up to half a billion people are chronically poor, most of them in South Asia and sub-Saharan Africa. Around one-third of all those who are extremely poor are poor over many years and may pass their poverty even to their children. In Africa, this kind of problem is much deeper and widespread than other regions. Half of the population of Africa lives in extreme poverty and one-third in hunger (Shugri, 2016).

Ethiopia was often being reported as one of the poorest countries in the world almost by all dimensions of poverty. In 2000, Ethiopia had one of the highest poverty rates in the world, with 56% of the population living below US$1.25 PPP a day (World Bank, 2015). Similarly in the same year (in 2000) but using national poverty line 44% of its population were below the poverty line (1,075 Birr/year) (MoFED 2013). However, more recent data shows that the proportion of people living below the national monetary poverty line in Ethiopia has declined from 29.6% in 2010/11 to 23.4% in 2014/15 (NPC, 2016).

According to Sudhakar and Nega (2015), Gulomekeda *woreda*, is severely deforested and suffers from acute and chronic poverty almost every year. The researchers have made a study on determinants of poverty in the rural area of the *woreda*, and have determined poverty line (food and non-food poverty line) of the rural part of the *woreda* and found to be 2094 birr per year per adult equivalent by using cost of basic needs approach. By using this poverty line as bench mark, the study showed that 51 % of the households are poor. However this research is conducted on the rural area of the *woreda* not in the towns of the *woreda*. In addition to this, the study was made on uni-dimensional poverty measurement not on multidimensional poverty.

Even if the multidimensional poverty of the *woreda* is not studied, at national and regional level, the multidimensional poverty study was made based on demographic and health survey (DHS) and the result data showed that 87.3 % of Ethiopians were multidimensionaly poor while in urban area MDP stood 46.3%. The MDP in Tigray region was found to be 85.4% in the same period of study (OPHI, 2013).

Analysis of poverty by using multidimensional poverty indicators at the non-capital towns (NCTs) of the *woreda* is selected to be important theme for this research. It is with the intention

that the NCTs -level approach helps to have interventions having more important effects on the livelihoods of the people. In line with this, to the extent that the researcher made an effort to review, there is no specific study made at the NCTs of the *woreda* either using uni-dimensional poverty measurement or multidimensional poverty measurement. Hence, this study was proposed to fill the gap related to the less-studied and less-emphasized NCTs of Gulomekeda *Woreda.*

1.2. Problem statement and the rationale

Poverty in Ethiopia is one of the pressing problems catching the attention of the government, development practitioners, non-governmental organizations (NGOs) and researchers. Poverty reduction strategy papers such as SDPRP (2002/03 – 2004/05), PASDEP (2004/05 – 2009/10), GTP 1 (2010/11 – 2014/15), GTP 2 (2016 – 2020) and poverty intervention programmes of the government and development practitioners are some of the witnesses of the attentions given to poverty issues in Ethiopia (Getaneh, 2017). However, it seems continuing to be one of the priority issues in Ethiopia in the years to come owing to the exiting fast rate of population growth (CSA, 2017), rapid urbanization (MUDC, 2012), broad-based population pyramid, enormous unemployment (NPC, 2016) and environmental degradation (Adugnaw,2014).

The data obtained from NPC states that the level and distribution of poverty in Ethiopia is declining from time to time and a considerable economic growth has been observed (NPC, 2016). According to the HICE survey and WMS carried out by CSA, in 1999/00 about 44% of the total populations (45% in rural areas and 37% in urban areas) were found to be below poverty line, while the 2004/05 surveys showed that 39% of the total population were under the poverty line out of which 35% in urban areas (CSA, 2012). The report on poverty analysis study in 2010/11 prepared by MoFED using the HICES has also showed that 29.6% population lives below poverty line. More recently, in 2014/15, the percentage of poor people below poverty line has reduced to 23.4% (NPC, 2016). GTP II has also targeted to further reduce the proportion of poor people to 16.7% by 2019/20.

Even though, the above studies showed that the proportion of poor people is relatively smaller than it was earlier and declining from time to time, studies made by World Bank, 2015 and OPHI, 2013, using MDP measurement showed that the proportion of deprived population is high.

In multidimensional poverty measurement perspective, there has been progress in reducing the proportion of households experiencing multiple deprivations in health, education and living standards. However, deprivation in some dimensions is still quite high in Ethiopia (World Bank, 2015). The relatively low rates of educational enrollment, access to sanitation and attended births. 89.48% children which is 49.15% in urban and 94.63% in rural were delivered at home, four in five rural households and two out of three urban households still experience at least one out of three deprivations (World Bank, 2015 and CSA, 2012).

Seff and Jolliffe, (2016) studied MDP in rural and small-town areas of Ethiopia based on Ethiopia socioeconomic survey (ESS) data and the result showed that there is mild declination of MDP from 90% in 2012 to 86 % in 2014. The MDP in Tigray Region was 81.32%. Similarly, multidimensional poverty study based on demographic and health survey (DHS) data showed that 87.3% of Ethiopians were multidimensional poor while in urban area it stood to be 46.3%. The MDP in Tigray was found to be 85.4% in the same period of study (OPHI, 2013). This indicates that problem of poverty when measured using MDP is more serious than what the uni-dimensional measurement shows.

It is in view of these empirical facts that this research intends to investigate the multidimensional poverty status of the households in selected NCTs. This is because multidimensional poverty analysis shows various aspects of the basic capabilities of individuals/households than the uni-dimensional measurement of poverty that only considers income (Sen, 1997). Even if, some multidimensional poverty-related studies have been made in Ethiopia, no specific study was made in Gulomekada *woreda* as a result of which this research has been thought-out.

According to Sudhakar and Nega (2015), Gulomekeda *woreda*, is severely deforested and suffers from acute and chronic poverty almost every year. The *woreda* faces constraints including shortage of land, land degradation and soil infertility, poor terms of trade and lack of investment, erratic and unpredictable rainfall patterns, poor access to market, few off farm employment opportunities, low agricultural productivity and chronic illness (REST, 2011 as cited in Sudhakar and Nega, 2015).

This research was carried out at NCTs of Gulomekeda *Woreda* because NCTs are assumed to be less emphasized and less privileged in provision of basic services such as schools, health institutions and infrastructure. According to Tegegne (2011), administrative status helps towns to get access to services and infrastructures, i.e. capital towns of different administrative levels of the government enjoys better access to infrastructure and services than non-capital towns.

NCTs are one of the urban spatial poverty traps that can be an agenda for scientific researches of this kind. Multidimensional poverty in the NCTs of the *woreda* is not studied to the extent of the reviews made by the researcher. Therefore, this study is designed to investigate the extent and determinants of multidimensional poverty of the two non-capital towns namely Sebeya and Zalambesa.

1.3. Objective of the study

1.3.1. General objective

The overriding objective of this study was to look into the extent and determinants of multidimensional poverty in non-capital towns NCTs of Gulomekada *Woreda*, Tigray Region, Northern Ethiopia.

1.3.2. Specific objectives

More specifically, the study targeted to:

- analyze the magnitude of household multidimensional poverty in Sebeya and Zalambesa towns
- investigate the deprivation percentage contribution of each multidimensional poverty indicators of the poor people.
- investigate the determinants of household multidimensional poverty in the towns

1.4. Significance of the study

This research paper is meant mainly for the fulfilment of MSc degree in Food Security and Development. Therefore, its main target is to play a role in academic/methodological aspects. In this regard, the research investigated the extent of MDP and its determinant factors of households in non-capital towns which can be useful as input for other researchers who are

interested in the area as there haven't been similar studies conducted in the towns. Hence, the output of this research will fill the knowledge gap on multidimensional poverty of households in the study area. This research will also help for policy improvement and local intervention practices. The identification of the level of multiple deprivations of the poor households and the determinants of poverty will help development practitioners and the governmental body to intervene in these towns by designing appropriate poverty reduction programmes. In addition to this, researchers and development actors in both the governmental and non-governmental organizations working in the area as well as elsewhere in the country with more or less similar socioeconomic, cultural and physical environment can use it as a reference.

1.5. Scope and limitation of the study

This study is spatially limited and undertaken in non-capital towns of Gulomekada *Woreda,* Tigray region in northern part of Ethiopia. The study has focused on households' MDP analysis of the NCTs. The data collection for the study has been conducted on the selected households of Zalambesa and Sebeya towns. Even though, similar studies made in Ethiopia and in another part of the world use different number of indicators (E.g. Global MPI commonly uses ten indicators regardless of the flexibility of the counting approach it uses), in this study, the multidimensional poverty indicators used were eleven by adding one additional indicator and contextualizing to the study area context.

The study has used mainly cross-sectional survey supported by key informants and observation. The degree of precision for sampling size taken in this study was 7% taking into consideration the remoteness of the area from Addis Ababa and the budget and time limitation. Accordingly, 210 samples were taken. Except for these reasons, 5% degrees of precision would have made the study better by taking larger sample households. But this does not mean that the findings of this research are far from precision, reliability and validity as all the remaining methodological precautions have been taken care of to enhance the quality of the research to the level best.

There was also limitation of similar literature because there was no similar study in the area and studies made based on MPI are a few in Ethiopia. As a result, it became difficult for this study to compare the result with other similar studies except a study made by Getaneh (2017) at three small towns of East Gojam Zone and OPHI study in Ethiopia in general. Hence it can be said

that there was similar study limitation especially at the study area and its surrounding. In addition to this, this study has focused on multidimensional poverty analysis and on their determinant factors due to time and cost constraint. It would have been also better for comparison purpose, had the consumption poverty studied in parallel.

1.6. Organization of the study

This thesis is organized in five major chapters. The first chapter included background, statement of the problem, objectives of the study, significant of the study and scope and limitations of the study. The second part deals with literature review that includes conceptual and theoretical frameworks of urban poverty and empirical studies made in the country and elsewhere in the world. The third chapter presented description of the study areas and methodologies used for the study. The findings of the study are presented in the result and discussions part in Chapter Four. Finally, Chapter Five presents conclusion and recommendations that are drawn from the study.

CHAPTER II: REVIEW OF RELATED LITERATURE

In this chapter, an attempt has been made to explain certain definitions and concepts used in this study. In addition, this part is intended to critically review the theoretical and empirical literature relevant to the present study's objectives.

2.1. Poverty and multidimensional poverty

2.1.1. Definition and concept of poverty

There are many conceptual perspectives of poverty making the concept complex because of its multifaceted nature and multidimensionality. As indicated by Onyango (2009), there are no universal consensuses among scholars towards poverty. Poverty has various interpretations within economic, social, political, institutional, environmental and cultural contexts. Hence, because of its variation in different views, disciplines and interpretation, various approaches have been employed to understand the concept of poverty (Esubalew, 2006). Townsend (2006), defined poverty in that people are said to be in poverty when they are deprived of income and other resources needed to obtain the conditions of life such as the diets, material goods, standards and services that enable them to play the roles to meet the obligations and participate in the relationships and customs of their society.

Poverty means lack of income and productive resources to ensure sustainable livelihoods by avoiding hunger and malnutrition, ill health, limited or lack of access to education and other basic services, increased morbidity and mortality from illness, homelessness and inadequate housing, unsafe environments and social discrimination and exclusion. It is also characterized by lack of participation in decision-making and in civil, social and cultural life (Pantazis *et al*., 2006). Besides, urban poverty is worsened by absence of capable urban administration that could provide adequate social services and infrastructure to urban dwellers (Asmamaw, 2004).

Furthermore, poverty embraces mostly the following dimensions namely lack of opportunities (material deprivation), lack of capabilities (low achievement in education, health and malnutrition), vulnerability (low level of security) and voicelessness (powerlessness). The first dimension (lack of opportunities) and the second (lack of capabilities) are more or less well-

measured while the third dimension (vulnerability) may not be appropriately measured. But, the fourth dimension (voicelessness) will never be measured at all (Tsegaye, 2014).

The World Bank (2000) developed a participatory approach and defined poverty as lack of material well-being (lack of food, water, health, clothe and shelter), lack of productive assets such as land and housing, unemployment, powerlessness, voiceless, hopelessness, marginalization, relying upon charity, lack of access to infrastructure such as roads, electricity, education, health and water and market places (not only mere absence but also quality of infrastructure), insecurity (crime and theft) and inadequate sanitation.

Poverty never results from the lack of one thing but from many interlocking factors that cluster in poor people's experience. Poverty is therefore, multi-dimensional phenomenon that encompasses not only low monetary income and consumption but also low human development such as education, health and nutrition (Sen, 1992). In relatively more detail description, poverty means the inability to meet basic needs, including food, shelter, clothing, water and sanitation, education and healthcare.

According to Sen (1999), poverty refers to deprivations in basic capabilities of the individual or family that the deprivation of basic capabilities is multidimensional and includes premature death, obvious malnutrition, persistent disease and widespread illiteracy, etc. One should understand deprivations in basic capabilities with reference to people's actual living and empowerment. Such capabilities enhance poor people's basic capabilities through education and health care and will increase their productivity and income.

Nutritionists developed the minimum monthly income needed to cover the minimum nutritional needs of a household in England in 1901(Townsend, 2006) as cited in Getaneh, 2017. According to Townsend (2006) families were defined to be in poverty when their incomes were not sufficient to obtain the minimum necessaries for the maintenance of merely physical efficiency. This works until the 1960s and the strategy to reduce income poverty during the period was economic growth. Later the method was strongly criticised since the method relegates human needs only to physical needs ignoring other needs more specifically social needs (Fukuda-Parr, 2006). The method did not also consider differences in age, sex, size, activities, metabolic rates and tests

among people in the computation of the standard. Moreover, food availability and prices affect the income needed to secure the nutritional needs and poverty lines are often drawn up at the level of the household, disregarding how the intra-household distribution affects individual nutrition levels.

Consequently, there was a shift in the 1970s from subsistence to basic needs approach to define poverty. In this approach poverty was seen as not only nutritional insufficiency but also lack of access to education, shelter, health and other services and the focus was on integrated rural development to surmount poverty (Townsend, 2006).

The dimensions of poverty added in the 1980s which increased the complexity of the meaning of poverty were the incorporation of the non-monetary aspects such as powerlessness and isolation, vulnerability and insecurity, capabilities and gender. The other dimension added in the meaning of poverty in the 1990s was lack of participation and social exclusion. Income is not the only indicator of poverty and income or consumption based measure of poverty is not a human-centered measure that can't capture the deprivations dimensions such as education and health. Therefore, Human Development Index (HDI) and Human Poverty Index (HPI) were put forth in 1997 by the United Nations Development Programme (UNDP) to objectively measure different dimensions of poverty directly rather than using the proxy indicator income or consumption (Getaneh, 2017).

2.1.2. Concept of multidimensional poverty

Multidimensional poverty is made up of several factors that constitute poor people's experience of deprivation such as poor health, lack of education, inadequate living standard, lack of income (as one of several factors considered), disempowerment, poor quality of work and threat from violence.

Conceptually, multidimensional poverty approach is opposed to uni-dimensional approaches, which views welfare according to revenue or expenditure. The argument on multidimensional approach is that all nonmonetary attributes of welfare have no markets and when these do exist they are imperfect (Bourguignon and Chakravarty, 2003). In other words, one can have enough revenue but fail to achieve a certain quality of life if certain public services are not available.

Even when markets exist for certain non-monetary attributes of welfare, there is no guarantee that they will be supplied with goods. For example, in a household that is classified as non-poor in monetary terms but whose household head spends money on alcohol at the expense of his children's food, education and clothing may not achieve the capabilities (Ningaye *et al*, 2011).

The capabilities approach (Sen, 1983, 1997,) criticizes poverty measurements based solely on resources, because resource availability says nothing about what people do or could do with those resources. Capabilities therefore indicate people's possibilities or degrees of freedom to satisfy certain functions, such as being well fed, obtaining employment and education, or living free of any sense of shame. In this rationale, poverty is viewed as an inability to achieve certain basic functions. A second argument justifying the development of multidimensional indicators is that measurements of poverty based solely on monetary incomes do not permit a complete evaluation of living standards. Identifying the poor on the basis of their current incomes approximates the capacity of households to consume through the market but it does not directly capture access to public goods (such as education, health, basic infrastructure) that are not acquired with income and this undermines the correlation between income and welfare.

2.1.3. Concept and definition of non-capital towns

At this point, it is better to define what cities and towns are. The definition of 'urban' varies from country to country and with periodic reclassification. It can also vary within one country over time, making direct comparisons difficult. For example: Botswana: define urban agglomeration of 5,000 or more inhabitants where 75 % of the economic activity is non-agricultural, Equatorial Guinea define district centers and localities with 300 dwellings and/or 1,500 inhabitants or more. Zambia like Botswana defines urban centers with inhabitants of 5, 000 or more, majority of whom depend on non-agricultural activities (Carter, 1995).

In Ethiopian contexts, urban centers with a population ranging from 2,000 to 20,000 are called small towns; and those with a population ranging from 20,001 to 50,000 are medium towns, while large towns are those with a population of 50,001 to 100,000. Urban center with a population of 100,001 to 1,000,000 are known as cities in Ethiopia; while those with over a million residents are referred to as metropolitans (MUDC, 2012). In this research the term n*on-*

capital town has been operationally defined as a town that is not serving as a *woreda*, zonal, regional or federal administration center regardless of population size.

Small towns which are found very close to rural areas play their central place functions by disseminating manufactured goods including agricultural inputs imported from large towns, providing services and collecting agricultural products for export and create a link between rural areas and large towns through these central place functions. In many smaller urban settlements, rural and urban activities are closely linked (Farrington *et al*., (2002). According to Farrington *et al*., (2002), small and intermediate towns in Sub-Saharan Africa are rural in character. That means, they lack the necessary infrastructure unlike large urban areas and their livelihood strategies are mainly of natural resources dependent. Therefore, rural and urban poverty are interwoven in which one is the cause for the other. For example, inadequate capacity of urban areas in the dissemination of agricultural inputs may reduce the productivity of agriculture which is a cause for rural poverty and vice versa.

The provision of credit and employment creation through micro and small enterprises are also highly concentrated in large and intermediate towns. The boom of construction activities, private sector investment particularly in services, labour intensive infrastructure development like cobblestone and public investment are also highly concentrated in large and intermediate towns (Getaneh, 2017). The majority of these towns have no municipalities to provide municipal services to their residents. On top of these, large firms and institutions which can generate employment opportunities in small towns are absent.

Small towns have also no annual budgets and the autonomy of urban administrations unlike towns of population size greater than or equal to 20, 000. Residents of these towns might have therefore limited livelihood opportunities mainly of self-employment because of the absence of all these necessities at the local level to create employment and help improve their livelihoods. Thus, households in these towns might be trapped by multiple deprivations of poverty (Getanh, 2017).

2.2. Theoretical foundations

There are three main theoretical foundations in literature concerning the definition and measurement of poverty. These are the welfare, the basic need and the capability views or schools of thoughts (Esbalew, 2006). Though these theories perceive poverty differently, there are areas in which they share some common meaning and all of them judge a person to be poor whenever he/she is lacking a reasonable minimum standard.

The welfare views: relates definition of poverty to the economic well-being of the society. It assumes that when; societies are not able to attain a level of economic well-being deemed to constitute a minimum by the standard of that society, then the person faces poverty. It sees income as a determining factor for the presence of poverty. It bases composition of well- being solely on individual utilities which are based on social preferences (Ravallion, 1993). Problems related to this school are the need to make inter-personal utility comparisons to obtain welfare functions, the degree of validity of full information and unbounded rationality on the part of consumers.

The basic needs views: defines poverty when one lacks basic needs (goods and services such as food, water, sanitation, shelter, clothing, basic education, health services and public transportation). It concentrates on the degree of fulfillment of basic human needs in terms of nutrition/ food, health, shelter, education, transport and so on. Asselin, (2001) argued that the definition and measurement of poverty are the major areas of limitations of the basic needs approach as the set of basic goods and services are different for different individuals depending on age, sex, type of activity, etc. of an individual that is under consideration. One of the basic problems Asselin, (2001) cited is how to determine the set of basic needs. There is even a high disagreement among professionals on the determination of basic needs.

The capability views: this theory emphasizes on neither the economic well-being nor the basic needs deemed to satisfy the minimum standard by the society; instead on human abilities or capabilities to achieve a set of functioning. This is an alternative criterion for the definition and measurement of well-being which tells the extent to which people have capabilities to do things of intrinsic worth. Such an approach to the definition and /or measurement of poverty suggests a broader set of criteria for assessing poverty than just income and/or consumption. The measure is

said to include publicly provided but non-marketed services; like, sanitation, health care, education and life expectancy (Davis *et al*, 2014). The difficulties of this method lie in the application of the concept of capabilities in practical poverty assessments. This school assumes that if one is lacking of the right to participate and does not perform the functioning's, he/she is considered to be poor.

The concept of poverty, its measurement and curative measures are also changing through time and nowadays one can find a number of dimensions in the concept of poverty and different objective and subjective methods of the measurement of poverty. According to UNDP (2006), poverty is categorized into four major clusters of poverty concepts. The first is income-poverty or its common proxy consumption-poverty. When many, especially economists, use the word poverty they are referring to these measures. The second cluster of meanings is material lack or want. Besides income, this includes lack of or little wealth and lack or low quality of other assets such as shelter, clothing, and furniture, personal means of transport, radios or television and so on. This also tends to include no or poor access to services. A third cluster of meanings derives from Amartya Sen, and is expressed as capability deprivation, referring to what we can or cannot do, can or cannot be. This includes but goes beyond material lack or want to include human capabilities, for example skills and physical abilities and also self-respect in society. A fourth cluster takes a yet more broadly multi-dimensional view of deprivation, with material lack or want as only one of several mutually reinforcing dimensions.

Nowadays, all of the researchers (Sen, 1999; Pantazis, 2006; Esubalew, 2006; Townsend, 2006) and policy makers agreed that poverty is not a one-dimensional or two-dimensional concept rather it is a multi-dimensional concept. What emerged is a multidimensional conception of poverty which cannot be objectively measured by any single method which can accommodate all dimensions of poverty (Fukuda-Parr, 2006).

Recognizing the multiple dimensions of poverty researchers and academicians developed and are developing different objective measures of poverty even though all dimensions of poverty cannot be reasonably integrated together in a single method for a meaningful result. Therefore, a new measure of poverty is developed because not the older measure is obsolete and less important

rather because of the change in the meaning of poverty by incorporating new dimensions in the older definition of poverty (Pantazis, 2006).

Therefore, in this research the meaning of poverty is related with capability perspective in which poverty is lack of adequate access to services (health, education) and living standard such as water, electricity, sanitation etc.

2.3. Approaches in multidimensional poverty analysis

Multidimensional poverty measures are being applied by multiple countries at the present time. In response to the conceptual and empirical motivations for developing measures to complement monetary poverty measures, multiple measurement approaches have emerged to measure poverty from a multidimensional perspective. A few of the main prevailing approaches are described below (Alkire *et al*. 2015).

1) **The dashboard approach:** In this approach each dimension of poverty are measured separately as a uni-dimensional measure; together these measures give empirical insight into the multidimensional nature of poverty and these may include deprivation indices that use a set of closely related indicators to reflect uni-dimensional concept other than monetary poverty, such as material deprivation. Dashboards have the advantage of broadening the set of considered dimensions, offering a rich amount of information and potentially allowing the use of the best data source for each particular indicator and for assessing the impact of specific policies such as nutritional or educational interventions. However, they have some disadvantages. First of all, dashboards do not reflect joint distribution of deprivations across the population and because of that it is considered as marginal methods.
2) **Venn diagrams:** Among marginal methods, Venn diagrams graphically represent the joint distribution of individuals' deprivations in multiple dimensions. Venn diagram shows all possible logical relations between finite collections of sets. It considers the joint distribution of deprivations for 2 - 4 dimensions. Yet they become difficult to read when more than four dimensions are used and may not identify who is multidimensional poor. The Venn diagram does not show summary measure hence no complete ordering.

3) **The dominance approach:** enables us to state whether a country or region is or is not unambiguously less poor than another with respect to various parameters and functional forms but it becomes empirically difficult to implement beyond two or more dimensions. It also shares with the Venn diagrams the disadvantage of not offering a summary measure. Moreover, the dominance approach only ranks regions or poverty levels from different periods ordinally; it does not permit a cardinally meaningful assessment of the extent of the differences in poverty levels.
4) **The composite indices approach:** the deprivation indices, possibly considered in a dashboard approach are converted into one single number in composite approach. Well-known composite indices include the Human Development Index, the Gender Empowerment Index and the Human Poverty Index.
5) **Fuzzy sets:** mathematical technique employed to identify mathematically the poor using fewer normative judgments. The fuzzy set approach addresses the intrinsic vagueness of the being poor predicate by using membership functions at the identification step. Instead of setting a crisp deprivation or poverty cut-off, it defines a band 'where the predicate is neither true nor false. Within the poverty band, a membership function is chosen to establish the degree of certainty of the predicates this person is poor or this person is deprived in a particular dimension. A fuzzy set approach may aggregate across dimensions using fuzzy logic operators and across individuals using an aggregation function.
6) **Axiomatic approach:** the axiomatic approach complies with the two steps of poverty measurement: identification and aggregation. In this approach, two broad identification methods have been used: the aggregate achievement approach and the censored achievement approach, with in the censored achievement approach, counting approach is used. The counting approach requires defining a deprivation cut-off z_j for each indicator x_i, so that each person is defined as deprived or not in each indicator by comparing her/his indicator achievement with the corresponding deprivation cut-off. Then applying some aggregation function to the achievements across dimensions for each person to obtain an overall or aggregate achievement value. A person is identified as poor when her/his aggregate achievement is below the aggregate poverty cut-off. The summary well-being measures of the poor are then aggregated to obtain a poverty measure of the poor people.

In this research the axiomatic approach is used because this approaches captures joint distribution of deprivations, identifies the poor and provide single cardinal index to assess poverty better than other approaches.

2.4. Multidimensional poverty measurement

The most recent development in the measurement of poverty is the Multidimensional Poverty Index (MPI) that can be determined using the Alkire Foster method. The Oxford Poverty and Human Development Initiative (OPHI) developed the MPI in 2010 for 104 lower and middle income countries of the world through the Alkire-Foster method (Alkire and Santos 2013). MPI is an extension of the HPI. MPI and HPI target at end of development than means and are a multidimensional measure of poverty on three dimensions such as health, education and living standard. MPI is different from the HPI in that the MPI identifies the simultaneous multiple deprivations of a household. The MPI is computed based on data from households or individuals using multiple indicators and compute the contribution of each indicator to poverty unlike HPI (Alkire& Santos, 2011). The MPI identifies multiple deprivations at the household and individual level in health, education and standard of living. It uses micro data from household surveys and unlike the Inequality adjusted Human Development Index all the indicators needed to construct the measure, must come from the same survey. Each person in a given household is classified as poor or non-poor depending on the weighted number of deprivations his or her household experiences (Alkire *et al.,* 2015).

Multidimensional poverty measure provides an aggregate poverty measure that reflects the prevalence of poverty and the joint distribution of deprivations. Multidimensional poverty measurement can be broken down conceptually into two distinct steps:

a) Identification step- defines the cut-offs for distinguishing the poor from the non-poor.

b) Aggregation step- brings together the data on the poor into an overall indicator of poverty. Alkire *et al*, 2015, has shown detail description steps of poverty identification and aggregation as indicated below.

Identification

1. Defining the set of indicators which will be considered in the multidimensional measure. Data for all indicators need to be available for the same person/household.
2. Setting the deprivation cutoffs for each indicator i.e. the level of achievement considered sufficient to be non-deprived in each indicator.
3. Applying the cut-offs to ascertain whether each person is deprived or not in each indicator. Deprivation Cut-offs is used to determine whether a person is deprived or not. The indicators' deprivation cut-offs are noted as Zi, so that person i is considered deprived if his/her achievement in that indicator Xi, is below the cut-off, that is, if $Xi < Zi$.
4. Selecting the relative weight or value that each indicator has such that these sum to one. A vector $W = (W1....Wd)$ of weights or deprivation values is used to indicate the relative importance of the different deprivations. If each deprivation is viewed as having equal importance, then this leads to a benchmark case where all the weights are one and sum to the number of dimensions d.
5. Creating the weighted sum of deprivations for each person which can be called his or her 'deprivation score'.
6. Determining the poverty cutoff, namely, the proportion of weighted deprivations a person needs to experience in order to be considered multidimensionaly poor and identifying each person as multidimensionaly poor or not according to the selected poverty cutoff. A poverty cut-off k satisfying $0 < k \leq d$ is used to determine whether a person has sufficient deprivations to be considered poor. If the i^{th} person's deprivation count (C_i) falls below K, the person is not considered to be poor; if the person's deprivation count is K or above ($Ci \geq K$), the person is identified as being poor. The title "dual cut-off" refers to the sequential use of deprivation and poverty cut-offs to identify the poor. If the person is poor, the identification function takes on a value of 1 and if the person is not poor, the identification function has a value of 0.

Aggregation

1. Computing the proportion of people who have been identified as multidimensionaly poor in the population. This is the headcount ratio (H) of multidimensional poverty also called the

incidence of multidimensional poverty. $H = \frac{q}{n}$ Where, q is the number of people who are multidimensional poor and n is the total population under study.

2. Computing the average share of weighted indicators in which poor people are deprived. This entails adding up the deprivation scores of the poor and dividing them by the total number of poor people. This is the intensity of multidimensional poverty also sometimes called the breadth of poverty (A). $A = \sum_{i=1}^{q} Ci / q$

   Where C_i is the censored deprivation score of individual i and q is the number of people who are multidimensionaly poor.

3. Computing the adjusted headcount ratio M_0 (MPI) measure as the product of the two previous partial indices; $MPI = H * A$. Analogously, MPI can be obtained as the mean of the vector of deprivation scores, which is also the sum of the weighted deprivations that poor people experience, divided by the total population.

After analyzing whether every household is deprived or not by each indicator, raw headcount ratio can be computed. The raw headcount ratio is simply the percentage of households deprived in a particular indicator regardless of the category of a household as multidimensionaly poor or non-poor. In other words, raw head count ratio shows the deprivation rates (percentage) in each indicator, which includes everyone who is deprived, ignoring whether they are multidimensionaly poor or not (Alkire & Santos, 2011).

Once the M_0 is computed it can be decomposed by population subgroups, dimensions and indicators and intensity of poverty (using cutoff). Thus, the censored headcount ratio of each indicator can be known and compared with the raw headcount ratio. In addition, the contribution of each indicator to the total deprivation can be computed. The censored headcount ratio is obtained simply by adding up the number of people who are poor and deprived in that indicator and dividing by the total population. The percentage contribution of each indicator to overall poverty is computed as follows (Alkire & Santos, 2011).

Contribution of indicator i to $MPI = \frac{WiCHi}{MPI} * 100$ Where, Wi is weight of indicator i and CHi is censored headcount ratio. Alkire & Santos (2011) noted that adding up the contribution of each indicator within the dimension gives the contribution of each dimension.

2.4.1. Multidimensional poverty dimensions, indicators and cut-offs

Based on the theory of basic capabilities, Alkire and Foster (2007, 2011) put forward the Alkire and Foster (AF) method to establish the analysis for MPI. The AF method first sets deprivation cut-offs for each indicators and then judges whether a person is poor through a calculation using a poverty cut-offs similar to that used for the calculation of incidence of poverty. When a person is poor in at least some proportion the dimensions, as specified by the poverty cut-off, s/he has fallen into multidimensional poverty category.

The global MPI includes three dimensions namely education, health and living standards and ten weighted indicators, with a poverty cut-offs weight of one-third for each dimensions (Alkire and Santos, 2014). The following figure shows, the three dimensions of multidimensional poverty and 10 indicators along with their respective weight.

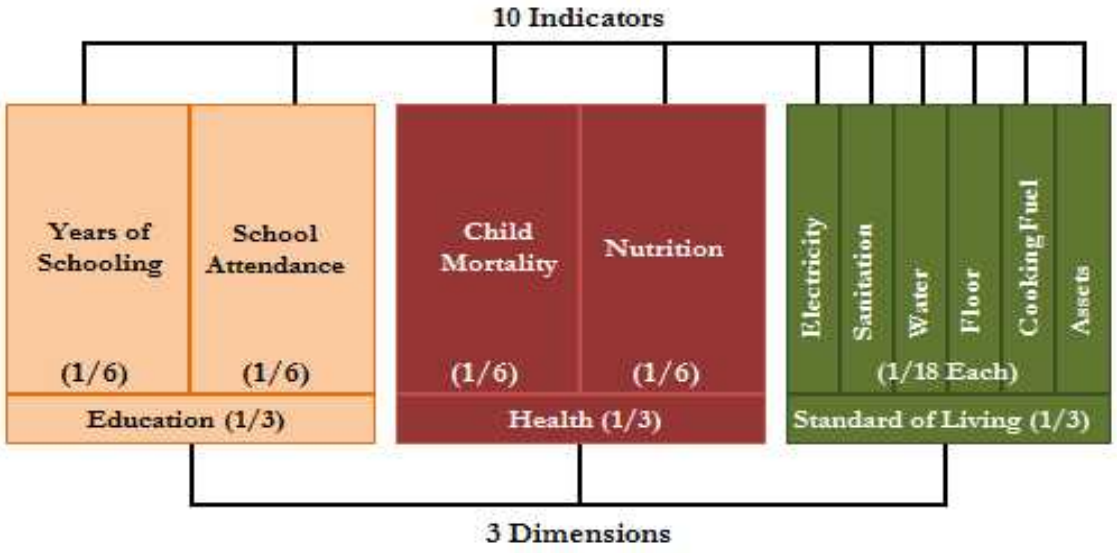

Figure 2.1: Composition of the MPI dimensions and indicators (source: OPHI, 2013)

The AF method is adopted more often in studies of multidimensional poverty because it is simple and easy to operate and the conclusion is more convincing. Most scholars have used the AF method in building the MPI but there is a big difference in the poverty dimensions and indicator they use (Alkire & Santos, 2011).

In relation with income, MPI measure of poverty fall into two argumenta categories. The first group believes that income is a dimension of multidimensional poverty and it constitutes multidimensional poverty together with education, health and living standards (Santos, 2013). The other group believes that multidimensional poverty is a complement to income poverty, focusing on the non-tradable aspects of individual or family poverty i.e. the non-monetary aspects. Many countries now have official national MPIs. As cited in Wang *et al.*, 2016 and Alkire and santos, 2013 Mexico is the only country to include income inside its MPI. The MPI in Mexico which was the pioneering measure launched in 2009, includes income, weighted at 50% and six social rights.

Other countries report MPI along with traditional monetary poverty statistics. For example; The MPI in Columbia covers five dimensions namely family education condition, children and youth condition, employment, health, access to public facilities and housing condition by using 15 indicators (Salazar *et al*. 2013). Colombia's MPI is reported alongside a separate income poverty measure. Bhutan's MPI has the same three dimensions as the global MPI and uses 12 indicators. Chile's MPI has four dimensions; education, health, labour and social security and housing and uses 12 indicators. Costa Rica's has five dimensions: education, health, housing, work and social protection and 20 indicators; El Salvador has a different five dimensions; Childhood and adolescence, housing, access to work, health and food security and uses 20 indicators. Ecuador's MPI has four dimensions; education, work and social security, health water and nutrition and housing and lived environment and 12 indicators (Alkire and santos, 2013). China's MPI has six dimensions which is education, health, housing, water and sanitation, energy and consumer durable goods and a total of nine indicators (Wang *et al, 2016*).

2.4.2. Vulnerability and severity of multidimensional poverty of households

Different literatures classify vulnerability and severity of multidimensional poverty into different categories. Alkire and Santos (2011) classified into sever and vulnerable. If the deprivation scores (Ci) is 33.3 percent or higher, the household including everyone in it is considered as multidimensional poor. Households with a deprivation score of 20% or higher but less than 33% are near multidimensional poor or considered to be vulnerable. Households with a deprivation score of 50% or higher are severely multidimensional poor. Getaneh, (2017) has also classified into four categories levels namely not vulnerable (C_i< 20%), vulnerable (33.3 < C_i >= 20%), less severe poverty (50% < C_i > = 33.3%) and severe poverty (C_i >=50%).

2.5. Review of related empirical literatures

2.5.1. A brief account at international studies on multidimensional poverty

According to Alkire and Santos (2010), a study on 5.6 billion people of 104 countries of the world showed that in 2010 about 1.7 billion (30.4%) people of the world was multi-dimensionally poor which was higher than the 1.3 billion poor studied using US $1.25 poverty line of the World Bank. Of the world total MPI poor, 51% live in South Asia and 28% in Sub-Saharan Africa though the proportion of multidimensional acute poor were 65% in Sub-Sahara and 53% in South Asia and 15% of the multidimensional poor lived in East Asia and the Pacific. The poorest country from the Sub-Saharan Africa is Niger, had 93% MPI poor people and people on average deprived 69% of the weighted indicators (Alkire & Santos, 2010). A country may be highly deprived in one dimension and less in others. In Pakistan 51 % were MPI poor.

2.5.2. Prevalence of poverty in Ethiopia

Poverty profile assesses the magnitude of poverty and its distribution across geographic and socioeconomic domains, provides information on the characteristics of the poor, illustrates the heterogeneity among the poor and helps in identifying empirical correlates of poverty. Ethiopian government conducts HICE analytical works in every five years to check the progress on poverty reduction endeavors. The available ones are mostly descriptive, focus on explaining the extent of poverty and most are associated with studies that relate to food and non-food entitlement failures (CSA, 2012; MoFED, 2013).

The results of the 1995, 1999, 2005 and 2011 HICES and WMS of CSA indicates that poverty head count index in the country measured by per capita income/consumption was 46%, 44%, 39% and 30% of the households respectively (CSA, 2012). Particularly, urban poverty accounted a head count index of 33%, 37%, 35% and 26% in the same years, respectively. This shows the high level of incidence of income or consumption poverty in urban Ethiopia. The incidence of income or consumption poverty in Tigray was 56%, 61%, 49% and 32% in1995, 1999, 2005 and 2011, respectively. In urban areas of Tigray region the incidence of income or consumption poverty was 46%, 61%, 37% and 14% in 1995, 1999, 2005 and 2011 respectively accounting for 32% point decrease from 1995 to 2011 (MoFED, 2012).

The MPI reveals a different pattern of poverty than income poverty measures. The multidimensional poverty study based on demographic and health survey (DHS) data on MPI showed that 87.3% of Ethiopians were multidimensional poor in 2013. The average intensity across the poor was 65%. The percentage of population vulnerable to poverty and in severe poverty was 7% and 71%, respectively. In terms of regional patterns of multidimensional poverty in the country, the highest incidence of multidimensional poverty was observed in Somali (93%) followed by Oromia (91%), Afar (91%), Amhara (90%) and Tigray (85%). The least was observed in Addis Ababa (20%), Dire Dawa (55%) and Harari (58%). The intensity was high in Afar (73%) followed by Somali (70%) and the least was Addis Ababa (42%) (OPHI, 2013).

The deprivations for each indicator in Ethiopia were also reported in 2013. That is 48% were deprived of schooling, 40% were deprived of child enrollment, 38% were deprived of child mortality, 56% were deprived of nutrition, 79% were deprived of electricity, 82% were deprived of sanitation, 65% were deprived of drinking water, 82% were deprived of floor, 88% were deprived of cooking fuel and 77% were deprived of assets (OPHI, 2013). Seff and Jolliffe (2016) studied MDP in rural and small-town areas of Ethiopia based on socioeconomic survey (ESS) and found that 90% were multidimensional poor in 2012 and the multidimensional poor people were declining to 86 % in 2014.

With regard to poverty in urban areas, urban poverty in Ethiopia is found to be low, as compared to rural poverty. In fact, urban poverty in Ethiopia is deep-rooted and large number of

households is trapped by one or more dimensions of poverty. The incidence of urban poverty in 2013 was 46.4%, lower as compared to the 96% in rural Ethiopia. The multidimensional poverty measurement also revealed that the percentage contribution of each indicator to the overall MPI in urban areas of the country in 2013 was 9% for school attendance, 10% for years of schooling, 14% for child mortality, 25% for nutrition, 3.4% for electricity, 10% for sanitation, 4% for drinking water, 8% for floor, 11% for cooking fuel, 7% for assets (OPHI, 2013). The highest contributor of the indicators to MPI was 25% for nutrition and 14% for child mortality.

UNDP Human Development Report (2016) shows the multidimensional poverty headcount ratio of Ethiopia was 88% and the intensity of deprivation was 61%. The contribution of deprivation in dimension to overall poverty was education 27.4%, health 25.2% and living standard 47.4%. Population near multidimensional poverty and population in severe multidimensional poverty were 7% and 67%, respectively.

Getaneh, (2017) studied multidimensional poverty in three small towns of East Gojjam, Amhara region by using AF method. The study towns are Wojel, Yetmen and Felege Birhan. The sample households of the three towns were 326 out of which 30% female headed and 70% male headed households. He pointed out that the headcount ratio (incidence) in the study towns was found to be 55% on average. The intensity (the average deprivation of the poor) of the average of the three towns was 47%. Getaneh has shown that the Multidimensional Poverty Index (MPI) of the towns is 26%. In each study town, the headcount ratios were accounted to be 63% in Wojel, 57% in Felege Birhan and 43% in Yetmen. With respect to the intensity of multidimensional poverty of each town, it was found to be 48%, 46% and 46% in Wojel, Yetmen and Felege Birhan, respectively. The MPI of the towns is found to be 30%, 26% and 19% in Wojel, Felege Birhan and Yetmen, respectively. The highest contributors to the MPI were years of schooling 6.4%, floor material 5.5%, durable assets 5.4%, type of cooking fuel 4.2% and source of electricity 2.9%. The largest average contributor to the MPI dimension was living standard, contributing more than 13%, accounted for more than 12% in Felege Birhan and Wojel and just over 15% in Yetmen. Next to living standard, education is the second poverty contributor. The least contribution to the MPI of all and individual study towns had come from the health dimension.

According to CSA (2012), the 2011 WMS showed out of the total population covered in the 2011 WMS, 16.9% reported as they have health problems at least once over the two months period which is 17.2% in rural and 15.5% in urban areas. The same survey showed that 7% of urban residents in Ethiopia had no access to safe water, 13% had no toilet, 27% had no access to sanitation and 56% lived in rented and rent free houses and 44% lived in a single room. Concerning cooking fuel, about 63.3% of the households used firewood as the main source of fuel for cooking in the urban areas. On the other hand, 17.5% used charcoal as the source of fuel for cooking. In Addis Ababa, electricity was found to be used by 18% of the households and charcoal by 37% of the households. Dung and manure were used by 12% of the urban households in Tigray.

CSA (2012) data also indicates about 85% of the rural households traveling less than five kilometers away for the closest source of drinking water. Around 5% of the rural residents were required to travel five to nine kilometers to fetch water for daily uses. The corresponding accessibility in urban areas was found to be much better. Only 0.5% of the urban households lived five or more kilometers away from the nearest source of drinking water.

As it has been clearly indicated here in before, a few studies are available on multidimensional poverty in Ethiopia. Most of the studies are made based on dashboard multidimensional poverty measurement method which views many poverty dimensions as a single dimension without aggregation. Actually, OPHI studied in 2013 using Alkir and Foster method that simultaneously uses dual cut off and aggregates the dimensions. However, there is no specific multidimensional poverty study made at the selected study area called Zalambesa and Sebeya towns. Therefore, it is expected that the current paper will bridge this gap in literature. Further, this study employed Alkir and Foster method to measure multidimensional poverty at household level and aggregate for the sample population.

2.5.3. Empirical studies on determinants of urban poverty

The Ethiopia rural socioeconomic survey of 2013 showed that average household size is 5.1 persons in rural and 3.9 persons in urban areas (CSA, 2013). The same survey has also showed that widowed persons are about 5% while divorced and separated persons account for about 3% of the relevant population.

Melese *et al., (*2017) conducted a study on determinants of urban poverty in the case of Nekemte town in six urban *kebeles* of the town. They identified determinants of poverty and found that family size and rural-urban migration have positive impact and significant effect on the probability of a household being poor. Sex of the household head, education level and salary were found to have negative impact and significant effect on poverty.

Beshir *et al., (*2016), made a study at Arsi administrative Zone, Oromia, Ethiopia and showed that income poverty was positively influenced by educational level, household size and business participation status of household heads. It was found that income poverty was negatively affected by age of households, marital status and economic status of parents. It was also found that income poverty was higher among divorced and widowed household heads as compared to the married groups. However, income poverty was lower for those participating in different business activities than household heads who do not participate in business activities.

Esubalew (2006), made a study on determinants of urban poverty in Amhara region, Debre Markos town and he found that average monthly income, family size, educational level and disease incidence are significant determinants of urban poverty.

2.6. Conceptual framework of the study

Conceptual framework is a set of ideas that shows the relationship between the dependent and independent variable used as a basis for making analytical discussion and conclusion on the relationship of the variables of the study (Kwadwo, 2015). It shows the inter-link and relationship between background, independent and dependent variables to be investigated by the research. The independent variables are assumed to influence the dependent variable selected for the research. Similarly, this study assumes that change in the dependent variable is subject to the changes in the independent variables. As showed in Figure 2.2, the dependent variable is the status of household multidimensional poverty; whereas the independent variables include several variables which are generally categorized in to demographic, socioeconomic and institutional factors assumed to determine the changes in the dependent variables. In addition, policy & good governance and biophysical resources have the capacity to affect multidimensional poverty status of the households. On the other hand education, health and living standard are dimensions that can measure MDP status of households.

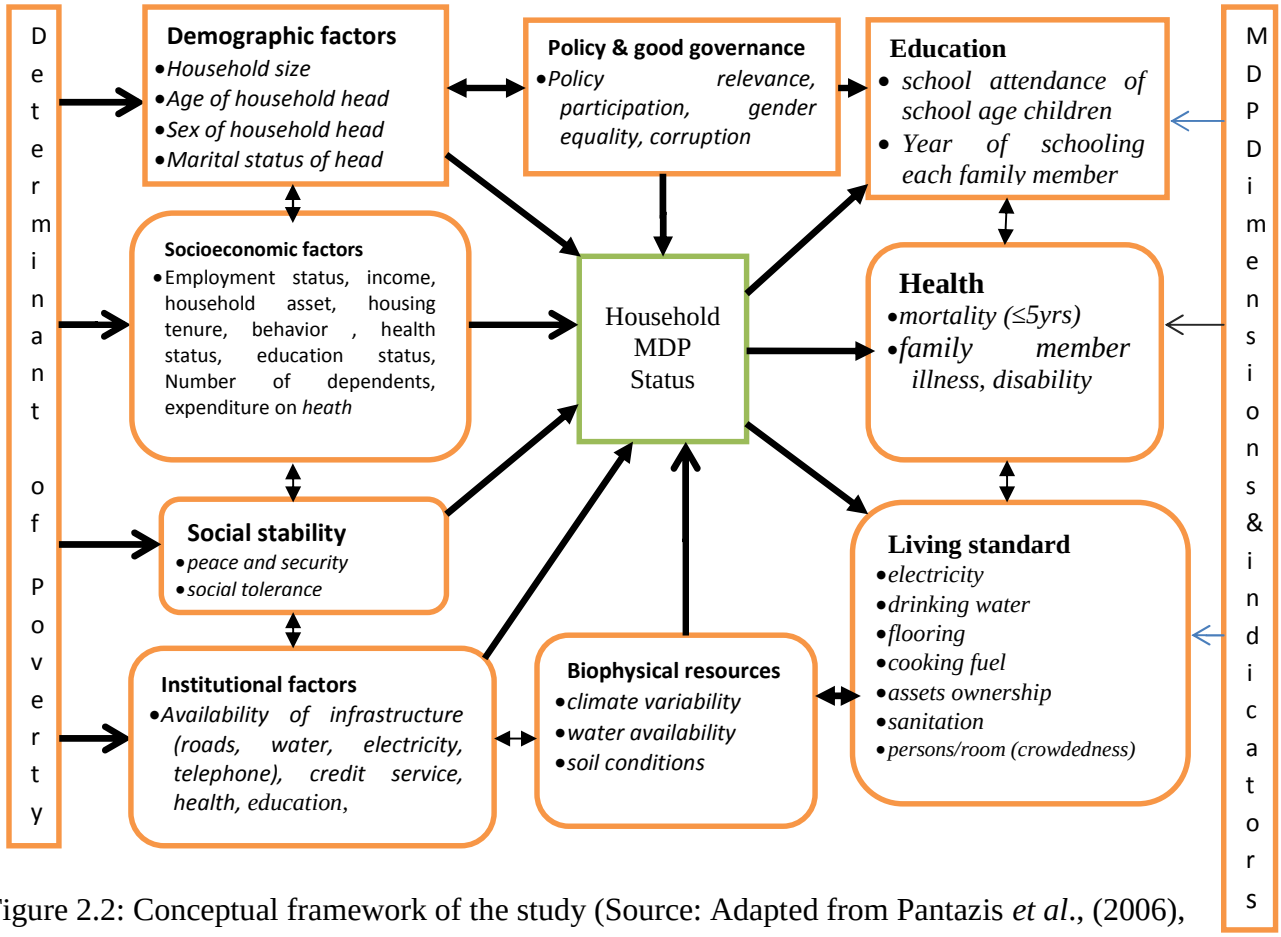

Figure 2.2: Conceptual framework of the study (Source: Adapted from Pantazis *et al*., (2006), Alkire and Santos (2010), Adetola, (2014) and other literatures

The conceptual framework mapped above helped to look into the factors that can affect poverty status. How the demographic factors and socioeconomic factors affect MDP and how the dimensions enables to measure and analyze MDP are well described in chapter 3. However, how the other factors such as policy & good governance, biophysical resources and institutional factors, affects multidimensional poverty is described below.

Poverty is a multidimensional problem that goes beyond economics to include, among other things, social, political and cultural issues. Therefore, solutions to poverty cannot be based exclusively on economic policies only but require a comprehensive set of well-coordinated measures. Good governance is a critical policy requirement for a successful poverty reduction

strategy and human development progress of any country. Where governance is poor, it is difficult to imagine equitable development and where there is inequity, the chances that some sections of the society will be left to live in poverty is high. Policies that targets on poverty reduction can improve the lives of many individuals while a lack of appropriate policy can lead to deeper poverty.

Among other things, policies on biophysical component affect lives of many individuals. The biophysical component relates primarily to the land resources and recognizes that no biophysical system can withstand unlimited utilization of resources. Hence, utilization should be guided by policy. The biophysical processes are interactions of climate, water, soils and land use/land cover characteristics of the earth surface. Climate change is very likely to increase the frequency and magnitude of extreme weather events such as droughts, floods and storms. Climate change will further reduce access to drinking water, negatively affect the health of poor people and will pose a real threat to food security. Climate variability can affect non-poor and poor households and shocks can make the poor, poorer and even the non-poor suddenly face a reversion in their living standards and all of a sudden become poor. Water resource impacts almost all aspects of the economy, in particular, health, food production, domestic water supply and sanitation, energy, industry and environmental sustainability.

Another important factor that affects multidimensional poverty status is institutional factors such as availability of infrastructure (roads, water, electricity and telephone), credit service, health and education. Infrastructure growth and services helps particularly for the poor people by contributing to their food security, job security, health security, community security, personal security and environmental security. Good governance is necessary to the successful implementation of infrastructure programmes and in turn infrastructure programmes can be important vehicles in the improvement of governance. Indeed, when good infrastructures are put in place, the efficiency and effectiveness of local government and administration are greatly enhanced.

Infrastructure helps reducing human poverty by directly improving access of people to health and educational services and contributing to non-income aspects of deprivations. Education can eradicate poverty. People living in poverty and could not receive a formal education will have a

much more difficult time of escaping away from poverty. The right education can lift people from poverty and improve their lives financially, physically and mentally. Sometimes the families are forced to pull children from school in order for them to work to support the family. Education and health are mutually reinforcing each other. Education improves food security and reduces malnutrition. By educating citizens on agriculture and farming techniques, they become capable of growing their own food and selling. This creates a source of income as well as healthy living.

Literacy allows women to read about prenatal vitamins and other health information during pregnancy. Families can learn about the importance of drinking clean water and safely preparing food. Education reduces the spread of communicable diseases that plague poverty stricken areas. When a community does not understand how a disease is spread, it can catch like wildfire infecting many people. But through education, children and families can learn how to protect themselves against illnesses like HIV/AIDS and other communicable disease. Education improves gender equity. By allowing girls to be educated, they are empowered to make their own decisions in life and it can cut the rates of early marriage and pregnancy.

All the above mentioned issues interact with each other in a mutually reinforcing way and affects multidimensional poverty. However, the scope and target of this study is to look into poverty determinant factors namely demographic factors, socioeconomic factors, partly institutional factors and the MDP indicators. The other factors such as policy and good governance, biophysical resources and social stability are discussed above for complete picture to show that MDP status is affected by many factors but they will not be investigated in detail in this study one by one due to time constraint and the need to be specific.

CHAPTER III: DESCRIPTION OF STUDY AREA AND THE RESEARCH METHODS

3.1. Description of the study area

Gulomekada *woreda* is located at 912 km North of Addis Ababa and about 135 km North East of, Mekelle, capital of Tigray National Regional State (TNRS). Gulomekeda is one of the *woredas* in Misraqawi (Eastern) Zone of Tigray bordered on the south by Ganta Afeshum *woreda* , on the west by the Ahiferom *woreda*, on the north by Eritrea, on the east by Erob *woreda* and on the southeast by SaesiTsaedaemba *woreda*. There are three small towns having 2,000 and above population in Gulomekeda *woreda* namely Fatsi, Sebeya and Zalambessa. Fatsi is a capital town of the *woreda* while the two towns are non-capital towns namely Sebeya and Zalambessa (GWAO, 2018). As indicated in Figure 3.1, the *woreda* is located at about 14^{o}17'14.11"- 14^{o}32'18.53" North latitude and 39^{0}13'59.25"-39^{o}36'31.49" East longitude.

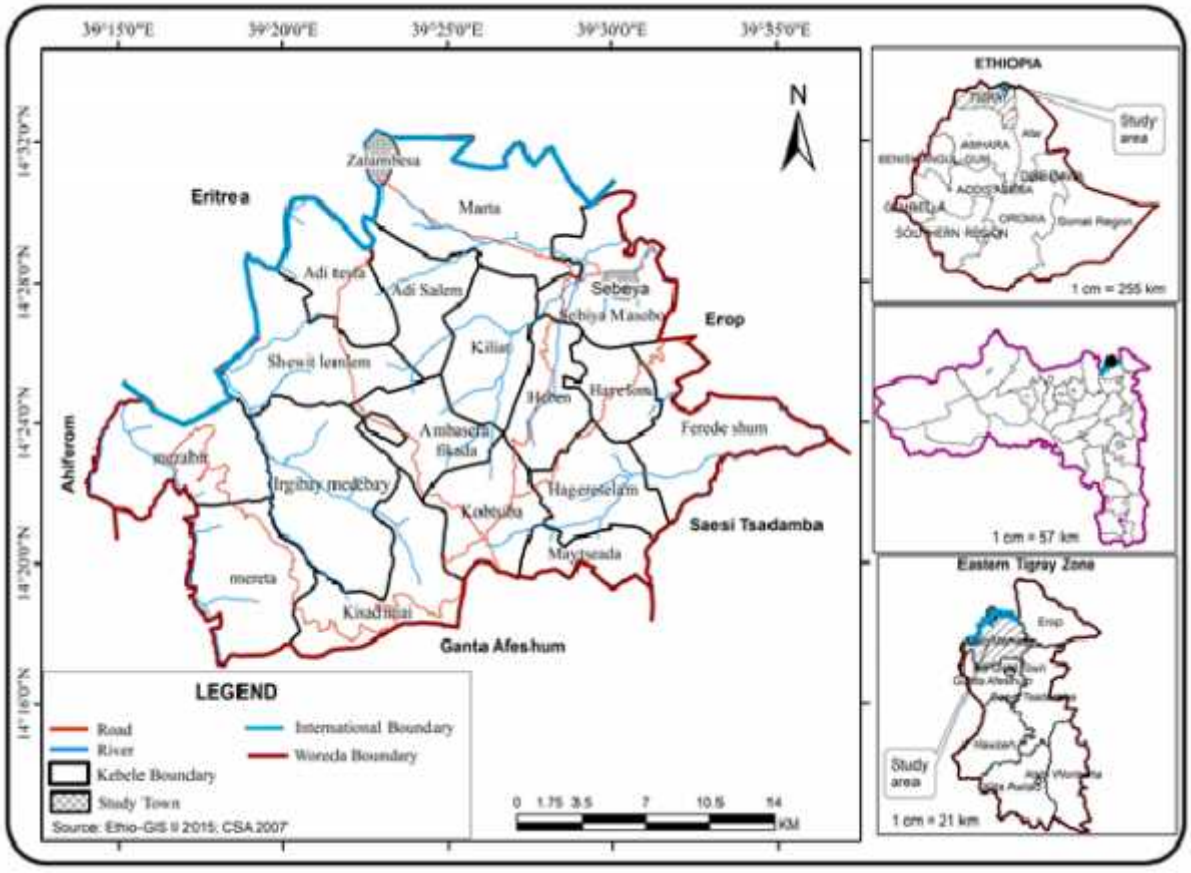

Figure 3.1: Location of Gulomekada *woreda* in its national & regional settings

3.1.1. Climate conditions

The main climatic features which helps explain Ethiopia's climatic resources are spatial and temporal (chronological) distribution of rainfall and temperature. In general, the highest mean annual rainfall, over 2,400 mm, is in the southwestern highlands in Illu Ababor Zone of Oromia Region. The amount of rainfall gradually decrease to about 600 mm in the north in areas bordering Eritrea, it also drops to less than 100 mm in the northeast in Afar and to around 200 mm in the southeast in the Ogaden (MoWR, 2001). The traditional climate classifications of the country based on altitude and temperature shows the presence of five climatic zones.

Table 3.1 Traditional climate classifications of Ethiopia based on altitude and temperature

Traditional climate classifications	Altitude (above sea level)	Average annual rainfall	Average annual temperatures
Bereha (hot arid)	500m	<400 mm	Ranges between 28C^{o} and 34 C^{o} or higher
Kolla (warm to hot semi-arid)	500-1,500m	Generally around 600 but can be as high as 1,600 mm	Ranges between 20 C^{o} and 28 C^{o}.
Weinadega (warm to cool semi-humid)	1,500-2,500 m	1,200 mm. In the southwest it reaches 2,400 mm.	Ranges between 16 C^{o} and 20 C^{o}
Dega (cool to cold humid)	2,500 to 3,200 m	1,000 and up to 2,000 mm in higher areas	Ranges between 10 C^{o} and 16 C^{o}
Wurch (cold moist temperature)	3,200 to 3,500 m	Generally below 800 mm	Below 10 C^{o}

Source: Summarized based on MoWR, 2001

Gulomekada *woreda* is moisture stressed (limited rainfall) area. The *woreda* gets an average annual rainfall of 501.6 mm and average temperature of 9.9-25.8^{0}c (NMA, 2018). This is very low as compared to most parts of Ethiopia, For example, the study by Messay, Degef and Gezahegn (2017) shows that the southern and southeaster parts of Ethiopia gets rainfall ranging between 850 mm and 1350 mm. The altitude of the *woreda* ranges between 1500-3200 m above sea level. The *woreda* is 99% *weinadega* and 1% *dega* (GWAO, 2018). As a result, one can understand that the actual rainfall record (501.6 mm) is very low when compared with the climatic classification of Ethiopia.

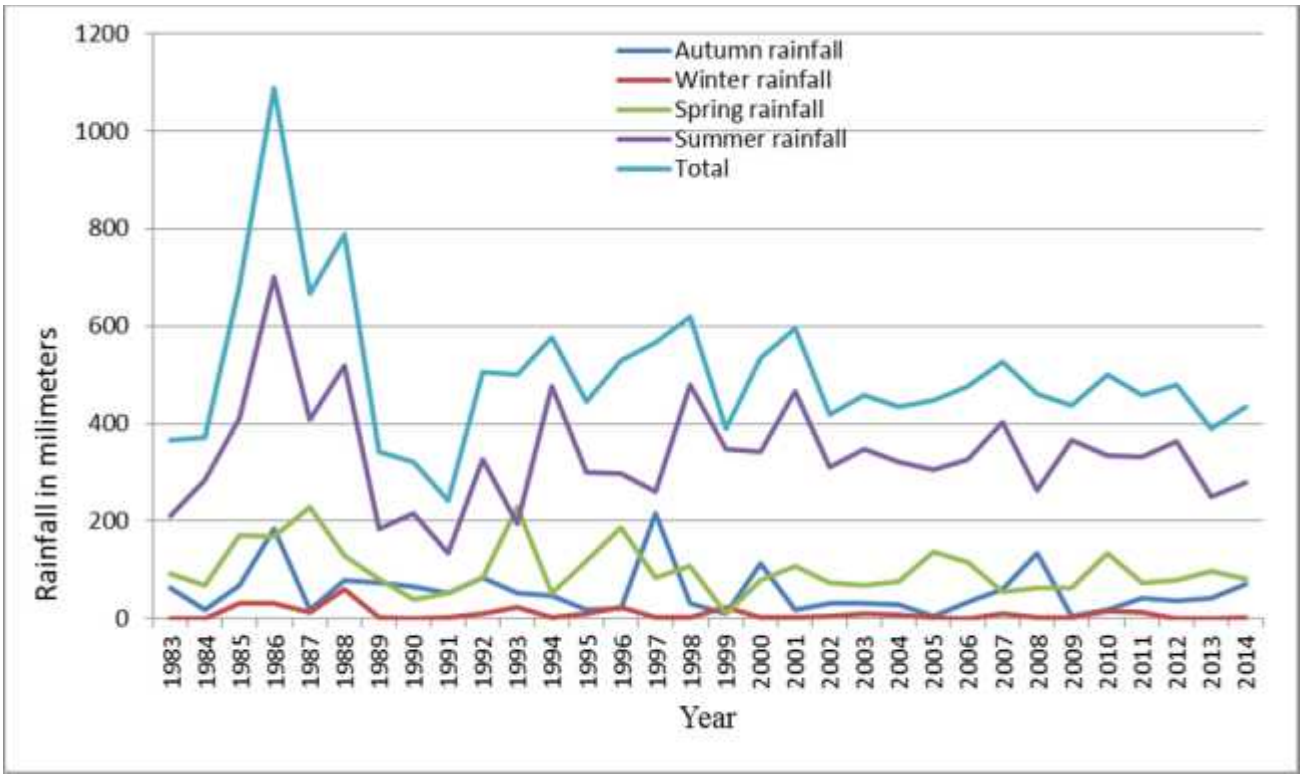

Figure 3.2: Long-term average seasonal and annual total rainfall in Gulomekada *woreda*. (*Source:* Computed based on grid meteorological raw data from NMA).

The long-term grid meteorological data (1983 to 2014) obtained from NMA of Ethiopia indicates that the area gets most of the rainfall amount in summer season which is June, July and August. The long-term annual total rainfall is computed to be about 501.6mm. As can be seen in Figure 3.2, there is variability of annual rainfall amount from year to year in the *woreda*. There was high rainfall amount that reaches 1,087mm/year in 1986. On the other hand in 1991 the lower rainfall amount was recorded as 243mm/year. The 501.6 mm average annual rainfall amount for 32 years shows that the area is drought prone and rainfall limited when compared with the Ethiopian annual average rainfall of *weinadega* (warm to cool semi-humid) which is 1,200 mm.

Regarding temperature conditions of the *woreda* the long-term annual maximum temperature is computed to be 25.8^{o}C, the annual average minimum temperature is 9.9^{o}C and the average of the two is found to be 17.9^{o}C (Figure 3.3). This implies that even if the area is classified as *Weinadega* in terms of altitude, the annual average temperature shows variability showing K*ola*,

weinadega and *Dega* temperature behavior referring to the Table 3.1. This in turn shows the deforestation and degradation of the area.

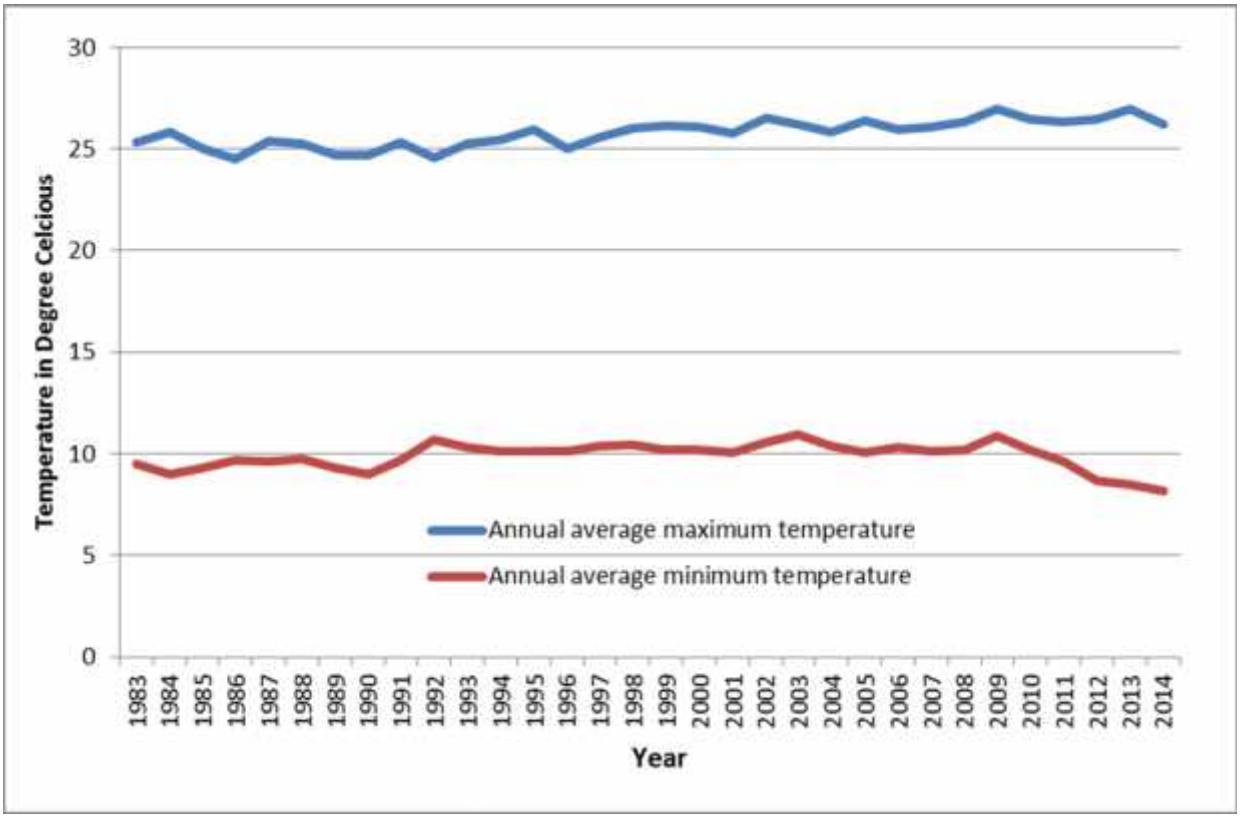

Figure 3.3: Long-term average minimum and maximum temperature Gulomekada *woreda*. (*Source:* Computed based on grid meteorological raw data from NMA)

3.1.2. Population and economic activities

According to CSA (2013) projection for 2017, the total population in Gulomakeda *woreda* was 98,857 in which 47,384 (47.9%) was male and 51,473 (52.1%) was female showing an increase of 17.3% over the 2007 census. According to Gulomekada *woreda* Administration Office , the total population of the two non-capital towns is 11,514 in which 9,034 (4,110 male and 4,924 female) live in Zalambesa and 2,480 live in Sebeya. The total area of the *woreda* is 59,328.06 hectare (593.28 kilometers square). The population density of the *woreda* is therefore, computed to be 167persons per kilometer square.

According to GWAO, the number of households in this *woreda* is 21,061. Out of this 17,097 household live in the rural and 3,015 households live in the two non-capital towns (2,587

households in Zalambesa and 428 in Sebeya) while 949 households live in the capital town called Fatsi. Of the total households living in Zalambessa, about 997 were male-headed and 1,590 were female-headed. About 99.22% of the inhabitants in the *woreda* are followers of Ethiopian Orthodox Christianity.

The major economic activity of the *woreda* is mainly mixed-farming system where crop production and livestock production are undertaken in an integrated way by rural households. As per the key informants' response, the *woreda* is drought prone, degraded and deforested. In addition to this, the rural households own on average 0.5 hectares of farmland. The economic activity of the urban households is mixed which is urban agriculture and trade. Petty-trade, such as- selling *tela*, food, coffee and tea, hand crafts and small shop are practiced widely as means of livelihoods for the urban dwellers. However, as per the key informant almost all the populations living in the towns are dependent on food aid because of their poor economic performances owning to erratic rainfalls, degraded environment, adverse impact of the Ethio-Eritrea wars and vicinity to Ethio-Eritrea conflictive border area. Moreover, the rural-urban linkage is poor as the rural people providing almost nothing to the urban dwellers as well as the urban market is also not as such serving the rural community in providing basic consumable commodities.

3.1.3. Historical overview of Zalambesa and Sebeya towns

Zalambesa*:* According to special publication of Makida Bulletin (2016) prepared by Fatsi and surrounding cooperative association, Zalambesa was believed to be a dense forest area that commonly lions and other wild animals were living abundantly before 1944. Its name has originated from the abundant existence of lions that in Tigrigna are called '*Anabis'* to mean lions. In Tigrigna language, the word 'Zala' indicates abundance while the word *ambesa* is to mean lions. Zalambesa was established in 1953. The primary cause for the establishment of the town was that it was a merchants' corridor. During its establishment, policemen started to live in Zalambesa by command of Betweded Haylemariam who was the administrator of Agame *Awraja*. This has marked the formal establishment of the town. In 1961, formal market day was started and the number of people living in the town increased from time to time. Following this, in 1963, education service was started in rented house. In 1973, Li-uel Mengesha Siyoum who was the administrator of Tigray, visited Zalambesa and made the school to be upgraded up to

Grade 8. At the same time, the administrator made one clinic get constructed. During the *Derg*, Regime, the people of the town had further upgraded the school to enable deliverance of education up to Grade 12.

The town has continued its development as a result of which additional public services opened. However, the town has been destroyed due to Ethio-Eritrea war in 1998. Post war, the town has been reconstructed and rehabilitated. Considerable support has been made to construct 969 houses for its residents. At this time, public services have been reconstructed and there are banking, three elementary schools, one high school, one Clinic, 24 hours electric power supply, potable water service regardless of scarcity in water availability.

Sebeya: Following the controlling of the area by Tigray people's liberation front (TPLF) by freeing the area from *Derg* administration, Sebeya was founded in 1976 due to the establishment of new market at Grahanse (now is found at the periphery of the Sebeya town). Starting from 1991, the market area shifted from Grahanse to Rebado, currently known as Sebeya town. In 1992, public clinic was opened. Then in 1992, up to Grade 6 elementary school was opened. Actually, starting from Haile Selassie Regime, there was elementary school up to Grade 4. In 2012, the town has been recognized as emerging town. Now the town has two elementary school, one high school (Grade 9-10), preparatory school (under construction),and one public clinic. However, there is limited access of electricity and water supply as witnessed by almost all the key informants.

3.1.4. Location and size of the towns

Zalambesa is part of Ethiopia that is found at Gulomekada *woreda* particularly at Ethio-Eritria border and 30km far away from Adigrat (capital of Eastern Zone of Tigray). It is located at northwest of Adigrat town. The area of the town is 9 sqaure kilometers. Sebeya Similarly is found at the same *woreda* and zone and 35km faraway from Adigrate. Sebeya is located at north of Adigrat as indicated in Figure 3.1.

3.2. Research methods and materials

3.2.1. Target population

The target population in this study is the people living in the non-capital towns of Gulomekada *woreda* which are Zalambesa and Sebeya. The total population of these non-capital towns is 11,514 in which 9,034 (4,110 male and 4,924 female) live in Zalambesa and a total 2,480 population live in Sebeya.

3.2.2. Research design and approaches

The research design for this study is cross-sectional survey design. This research design was selected because most of the primary data used for this research were a onetime socioeconomic data (data of a specific point in time) collected from adequate number of survey.

A mixed research approach was used in this research. As indicated in Powell *et al.* (2008), quantitative and qualitative phases occurred at approximately the same point in time, with the quantitative phase being given higher priority and mixing occurring within or across the data collection, analysis and interpretation stages is used in this research. Creswell (2009) underlines that importance of mixed methods approach is highly recognized by researchers in social sciences particularly for research in poverty and livelihoods.

3.2.3. Data types and sources

Both primary and secondary data types were utilized for this research which was gathered from both primary and secondary sources. The primary data were obtained from sample respondents, KIIS and observations. Most essential secondary data for this study were obtained from different organizations like Central Statistical Agency of Ethiopia (CSA), National Meteorological Agency (NMA), Gulomakeda *woreda* Agriculture Office and Gulomakeda *woreda* Public Relation and Communication Offices. Moreover, unpublished and published documents such as research journals, magazine, international reports like UNDP report on poverty, OPHI report and other organizations report were among the crucial secondary data sources used in this study.

3.2.4. Sampling techniques and sample size determination

Gulomakeda *woreda* was selected purposively for this study. The main purpose for the selection of the *woreda* was first and foremost is absence of other similar studies on multidimensional poverty analysis and its determinants in the *woreda* and in the non-capital towns of the *woreda*. Secondly, the *woreda* is one of the disadvantaged *woredas* owing to its furthest location mainly from national and somewhat from regional administrations as well as its location in Ethio-Eritrea conflictive areas. Due to this condition, there is poor terms of trade and lack of investment (Sudhakar and Nega, 2015). Particularly, the NCTs are found at the border of the *woreda* and assumed to be more disadvantaged in all socioeconomic aspects when compared with the capital town that the capital is expected to get budget priorities and better economic activities because it is the resident town of the administration (Tegegne, 2011). The third reason is familiarity of the researcher with the *woreda* since childhood. This has enormous importance in that it helps to investigate the issue under study from the bottom of the problem because the researcher knows the culture of the surrounding that in turn helped to know how to communicate.

There are three small towns in Gulomakeda *woreda* namely Fatsi, Zalembesa and Sebeya. Out of the total three small towns of the *woreda* the two towns namely Zalembesa and Sebeya are non-capital and are selected for this study because of the abovementioned reasons.

In the second stage, in Zalembesa there are four *ketenes* and the second town i,e Sebeya is not classified into *ketenas.* It is considered as one *ketena*. Then two sample *ketenes* were selected from Zalambessa by using simple random sampling technique because the peoples' livelihood in the town is more or less homogeneous and Sebeya town has been taken as it is for this study. This is because Sebeya has only one *ketena.* Accordingly, the selected *ketenas* are Araguro and Addis Alem from Zalambesa and Sebeya town.

The total numbers of households in the two towns are 3,015. The appropriate sample size for this study was computed to be 210 by using Yamane (1967)'s statistical formula. The degree of precision to calculate the appropriate sample size is taken as 7% taking into consideration the homogeneity in livelihood of the people, balance between accuracy of representativeness, remoteness of the study area, cost and time. The total sample size was distributed proportionally to each sample *ketenas'* household size (Table3.1).

$$n = \frac{N}{1+N(e)2} \quad \text{..... (1)}$$

Where n is the sample size, e is the level of precision assumed to be 7% in this case.

N is the total household of the small towns. Thus N= 3,015

$$n = \frac{3{,}015}{1+3{,}015(0.07)2} = 191$$ By adding 10% = 19 non responsive, the sample size is found to be 210.

To determine the proportional sample size from the selected towns of Zalambesa and Sebeya, total sum of households are found to be $2{,}587 + 428 = 3{,}015$ as per the sample size calculation above, the total sample respondents in the two non-capital towns is 210 households.

The percentage computation for Zalambesa is $\frac{2{,}587}{3{,}015} * 100 = 86\ \%$ indicating 86% of 210 households = 181 households and for Sebeya $\frac{428}{3{,}015} * 100 = 14\ \%$ i.e. 14% of 210 households =29 households.

In Sebeya, there is only one *Ketena* and the proportional households sample size is 29. However, in Zalanbesa, the researcher has taken two *ketenas* from four *ketenas* using simple random sampling and further proportional number of sampling has been taken from the two *ketenas* as presented in Table 3.1.

Table 3.2: Number of households and sample size distribution of the sample *Ketenas*

Towns	Total number of households	*Ketenas*	Sample *Ketenas*	Total number of households	Sample household
Zalambesa	2,587	Miserak Tsehay	Addis Alem	588	78
		Arat Kilo			
		Araguro	Araguro	769	103
		Addis Alem			
Sebeya	428	Sebeya	Sebeya	428	29
Total	**3,015**			**1,785**	**210**

Source: Survey result, 2018

Finally, simple random sampling technique (SRS) was used to select 210 households form the selected *ketenas*. As indicated in Ary et.al. (2010), SRS technique gives an equal chance of selection for every member of the population.

As discussed above, the total number of households surveyed was 210. However, the analysis was made on 206 households due to the reason that four questionnaires (1 from Sebeya and 3 from Zalambesa) were not properly filled and rejected as a result. Therefore, the response rate was 98.1% and the non- response rate was 1.9%.

3.2.5. Tools and techniques of data collection

The data for this study was collected using three major techniques. These are household survey, key informant interview and observation.

Household survey: The data was collected using survey questionnaire, which includes demographic characteristics that included age, gender, education level of household head, income, health status of the households, education status, living standard and other determinants of household poverty that would enable measure the MDP and associated factors after reviewing relevant literatures. The questionnaire was prepared in English first and then translated in to the regional language, Tigrigna. The aim of translation was to enhance communication between enumerators and the respondents and not to miss pertinent information due to language barrier. Four experienced data collectors (enumerators), development agent (DA) and teacher in profession and having degree, were employed to collect the data and the researcher has offered a one day training on the content, objective of the questionnaire and explained point by point. Moreover, further explanation was given on methods of data collection including how they should approach respondents, conduct interviews and request the respondents to give relevant figures on sensitive economic, demographic and social factors.

Subsequently, a total of 4 pilot households were taken that each enumerator pre-tested the questionnaire on one pilot household with the close supervision of the researcher. The pilot questionnaire has showed that the questionnaire was clear enough except minor modifications of wordings. Accordingly, some modification of wordings was made on the final version. Finally, conducting survey began at Zalambesa and then proceeded to Sebeya. During data collection

time, the enumerators were giving to respondents a clear introduction explaining the purpose and objectives of the study under the close supervision and guidance of the researcher.

Key informant interview (KII): This is an interview with persons having special information about the socioeconomic conditions of the Gulomekada *woreda*. It was conducted with chairman of each town, extension workers, *woreda* agriculture office, food security disaster prevention and preparedness, education office, trade and industry office and elderly persons to gather information on the households' access to infrastructure, over all poverty status, children drop out from school, households use of improved toilet, the culture of use of electricity for cooking, major economic activities and determinant factor of poverty to support the primary data.

Observation: were employed to collect primary data for this study as supportive method to collect primary data for the study particularly living standard. The living standard of households such as sanitation, kitchen, housing and flooring materials were observed and photographed with the consent of the observees.

3.2.6. Techniques of data analysis

3.2.6.1. Descriptive statistics

Descriptive statistics methods such as frequency, percentage, mean and standard deviation were extensively employed to analyze the numerical data obtained through household survey and secondary sources for this research. The collected data includes, but not limited to, climatic, demographic, health, education, socioeconomic and living standards. Moreover, the poverty determinant factors that affect household poverty status were tested, whether they are statistically significant or not using chi-square test. Statistical Package for Social Science (SPSS) version 22 were used as tools for data entry and analysis.

3.2.6.2. Procedures in multidimensional poverty measurement

In this study**,** the Oxford Poverty and Human Development Initiative (OPHI) methodology developed by Alkire and Foster (2007, 2011) method was used to analyze the multidimensional poverty (Simultaneous multiple deprivation of households) because the method is flexible and

can be used with different dimensions and indicators specific to different societies and situations (Alkire and Santos (2010). The method is called counting approach.

To analyze the extent of MDP in the study area, different steps were used. First, MDP indicators were identified based on global MPI and different researchers with their deprivation cut-off and weight with their sum to be one. Then, some MDP indicator's deprivation cut offs were contextualized to the local area situation such as year of schooling, cooking fuel (ventilation and improved stove), sanitation.

Furthermore, two commonly pursued procedures were used for the attainment of the first objective of the study. These are: identifying deprivation cut off of each household's multidimensional poverty indicators and by summing the cut off score weight (1 for deprived and 0 for not deprived), each household was identified as multidimensionaly poor or not according to the selected poverty cut-off which is 33.3 %. The deprivation score C_i of the i^{th} poor person can be expressed as the sum of the weights associated with each indicator j (j = 1, 2... 11) in which person i, is deprived, $C_i = C_{i1} + C_{i2} + \ldots + C_{i11}$. If deprivation score of the household is >=33.3%, the household is identified as poor if the deprivation score of the household is < 33.3%, it is identified as non-poor. After identification of the poor from non-poor, the next step is aggregation by computing the headcount ratio (*H),* intensity of poverty and MPI of the sample population.

The proportion of people who experience multiple deprivations which is headcount ratio is computed as $H = \frac{q}{n}$

Where q is the number of people who are multidimensional poor

n is the total population under study

Intensity of poverty, ***A***, reflects the proportion of the weighted component indicators in which, on average, poor people are deprived. For poor households only (deprivation score C*i* of 33.3 % or higher), the deprivation scores are summed and divided by the total number of poor people.

To compute the average share of weighted indicators in which poor people are deprived, the formula is: $A = \frac{\sum_{i=1}^{q} Ci}{q}$

Where, Ci is the censored deprivation score that the ith poor person from poor households experiences.

q is the number of people who are multidimensionaly poor.

The MPI value is the product of two measures, the headcount ratio and the intensity of poverty.

$MPI = H * A$

To achieve the second objective that is the contribution of each indicator to overall poverty, first censored head count ratio of each indicator is calculated. The term censoring is the process of removing from deprivations consideration belonging to people who don't reach the poverty cut-off and focusing instead on those who are multidimensionaly poor. The censored headcount ratio is obtained by adding up the number of people who are poor and deprived in that indicator and dividing by the total population. The percentage contribution of each indicator to overall poverty is computed as follows:

Contribution of indicator i to MPI= $\frac{WiCHi}{MPI} * 100$

Where, Wi is weight of indicator i and CHi is censored headcount ratio.

In addition, one can calculate raw headcount ratio. The raw headcount ratio is simply the percentage of households deprived in a particular indicator regardless of the category of a household as poor or non-poor.

3.2.7. Dimensions, indicators and poverty cut-off

In this study, the AF method is used to investigate MDP. The indicators and dimensions weights and poverty cut-offs were used to identify the multidimensional poor in the study areas. The indicators were taken from global MPI and different empirical literatures. The deprivation cut-off of MDP indicators in this study is based on the global MPI which is 33.3 % of the weight of

all the selected indicators. Actually, the global MPI by itself was based on the consensus of MDGs and the poverty cut-offs.

As indicated in Alkire and Santos (2011) to identify the multidimensional poor, the deprivation scores for each indicator are summed to obtain the household deprivation score. A cut-off of 33.3% which is equivalent to 1/3 of the weighted indicators is used to distinguish between the poor and non-poor households. If the deprivation score is 33.3 percent or higher, the household including everyone in it is considered as multidimensional poor. Households with a deprivation score of 20% or higher but less than 33% are near multidimensional poor and considered to be vulnerable. Households with a deprivation score of 50% or higher are severely multidimensional poor.

The dimensions selected for this study are health, education and living standards as per global MPI. The weights of the indicators given for this study are equal and the sum of the indicators was the weight of the dimension which was one third in this case. This is because having roughly equal weights across dimensions eases the interpretation of the index. All dimensions were given equal weight and each indicator of the dimension shared the dimension's weight equally. Thus, the weight of each dimension was 1/3 and the weight of each indicator under health and education dimension was1/6 while the weight of each living standard indicator was1/21. The dimensions and indicators of the dimensions as well as their cut-off points for this study are modified from Alkire and Santos (2010), Getaneh, (2017) and Adetola, (2014) and indicated and presented as follows:

- **Education:** This study used two indicators in this dimension. These are **years of schooling and child school attendance.** Each indicator is weighted equally at 1/6. Years of schooling acts as a proxy for the level of knowledge and understanding of household members (Alkire & Santos, 2011). In terms of deprivation cut-offs for this indicator, if one person in the household has not completed four years of schooling (based on FDRE General Education Syllabus which is called 1st cycle primary education), the household is considered to be deprived. A household is deprived if one of the school age children (age 7 -15years) are out of school and not deprived if all the school age children were attending their schooling.

- **Health:** This dimension of MDP takes into account child mortality and illness (disability and morbidity) as indicators. Each indicator is weighted equally at 1/6. Child mortality is considered as an indicator in this dimension as it is preventable and being caused by infectious disease or diarrhea. As well child malnutrition also contributes to child death (Messay, *et al*. 2017). Alkire & Santos (2010) indicates that if any child in the household was dead in the past five years not because of accidents such as traffic, flooding, fire and falling from heights, a household is considered to be deprived by this indicator. Regarding illness (disability and morbidity), Adetola, (2014) and Getaneh, (2017) states that if anyone (family member) in the household was seriously ill and activities are stopped due to illness, receive no medical treatment and if received but not cured, the household is considered as deprived in this indicator. According to CSA 2011 WMS report, health problems at least once over the two months period prior to the date of interview is considered as a reference period to assess illness. Hence, illness in two months' time is considered in this research. Illness removes individuals from the labor pool and drains the money or household resources for treatment. It is considered to affecting the economic stability of the household. If there is disable in the household that can't hear, can't see, and can't move without help; the household is said to be deprived to this indicator (CSA,2013).

  In this research, it is considered that the household is deprived with regard to illness if anyone in the household was seriously ill and usual activities were stopped due to illness in the last two months or if there is disable in the household that can't hear, can't see and can't move without help; the household is said to be deprived to this indicator.

Living standard: This dimension comprises of seven indicators. Each indicator is weighted equally at 1/21. As indicated in Alkire & Santos (2010) the three standards of MDG indicators relate to health and living standards and particularly affect women are (i) access to clean drinking water, (ii) access to improved sanitation and (iii) the use of clean cooking fuel. The three other indicators are (iv) access to electricity, (v) room availability and (vi) the nature of room flooring materials assumed to provide some proxy indication of the quality of housing for the household. The seventh indicator is intended to cover the ownership of some assets (Alkire and Santos, 2013).

The detail of each indictor for the living standard dimension of the MDP is presented hereunder so as to fit to the analysis of the local situations:

a) **Water:** A household has access to clean drinking water if the water source is any of the following types: piped water, public tap, borehole or pump, protected well, protected spring or rainwater and it is within a distance of 0.5km in urban areas according minimum standard of the first Growth and Transformation National Plan for the Water Supply and Sanitation Sub-Sector of Ethiopia (FDRE, 2015). If it fails to satisfy these conditions, then the household is considered deprived in access to water.

b) **Improved sanitation:** A household is considered to have access to improved sanitation if the household has some type of flush toilet or latrine, or ventilated improved pit or composting toilet, provided that they are not shared by households of more than one compound. If the toilet is shared by households with in a house or compound, the households are not deprived. But if the toilet is shared by households out of the house or compound or communal, the households are considered as deprived. If the household does not satisfy these conditions, then it is considered deprived in sanitation. This is because, as indicated in CSA (2012), efficient management of human waste is one of the indicators of the well-being of the household and of utmost importance to basic health standards of home.

c) **Electricity:** A household is considered to be deprived of electric power if it does not have access to any form of electricity (powered by solar battery or hydroelectric or wind) or if rented (shared from neighbor).

d) **Room flooring**: Flooring material made of dirt, sand or dung counts as deprivation in flooring. As this type of housing is generally considered as poor quality houses (UN-habitat, 2009) and may have an impact on the health of households. A household who was living in cement floors housing are considered to be non-deprived.

e) **Room density (**Overcrowding**):** This indicates number of persons per room. A household was deprived in rooms if more than three persons lived per room. Conversely, a household was considered not deprived in room if three and less than three persons were living per room. The number of rooms excludes kitchens, bathrooms, toilets and rooms used for business purposes. (UN-habitat, 2009).

f) Cooking fuel: A household is considered to be deprived in cooking fuel if the household cooks with dung/leaves; charcoal or wood, grass and had no improved oven such as *lakech, mirt, and* the kitchen is not ventilated, the household is deprived. If the household's cooking fuel is dung/leaves; charcoal or wood, grass, and uses improved oven such as *lakech, mirt,* and the kitchen room is ventilated of cooking smoke or uses Electric oven or electric *mitad,* the household is not deprived. This is because, excessive use of charcoal, animal dung and firewood in a non-ventilated kitchen or non-improved oven affects the health of a household (Ekouevi, 2016**)** which in turn affects the livelihoods of the household.

g) Assets ownership: If a household does not own at least two of the assets, the household is considered to be deprived. The assets are radio, TV, telephone, bike, motorbike, car, animal cart and refrigerator. It is clear that all the living standard indicators are means rather than ends; they are not direct measures of functioning. However, unlike income, these are the means very closely connected to the end (or the functioning).

Table 3.3: Summary of dimensions, indicators, deprivation cut-offs and weights of MPI

Dimension &Weights	Indicators &Weights	Deprive if ---
Education (1/3)	years of schooling (1/6)	Any household member that could have reached grade 4 but has received less than four years of Schooling. The deprivation index is 1; otherwise, the index is 0 indicating the household is not deprived.
	child school attendance (1/6)	Households with children aged 7 -15 years out of school are regarded as deprived. The deprivation index is 1; otherwise, the index is 0.
Health (1/3)	child mortality (1/6)	A child was dead in the household in the past five years. The deprivation index is 1; otherwise, the index is 0.
	seriously ill (disability and morbidity) (1/6)	Anyone in the household was seriously ill and usual activities were stopped due to illness in the last two months or if there is disable person in the household. The deprivation index is 1; otherwise, the index is 0.
Living standard (1/3)	water source (1/21)	A household has no access to clean drinking water source of the following types: piped water, public tap, borehole or pump, protected well, protected spring or rainwater, and it is within a distance of 0.5km. The deprivation index is 1; otherwise, the index is 0.
	Improved sanitation (1/21)	A household has no access to improved sanitation such as flush toilet or latrine, or ventilated improved pit or composting toilet and if the toilet is shared by households out of the compound or communal, the households are considered as deprived. The deprivation index is 1; otherwise, the index is 0.
	Electricity (1/21)	Household with no access to any form of electricity and if rented (shared from neighbor) regarded as deprived and the deprivation index is 1; otherwise, the index is 0.
	Room flooring (1/21)	The household has a floor made of dirt, sand or dung. The deprivation index is 1; otherwise, the index is 0.
	Room density (1/21)	Households live more than three persons per room regarded as deprived and the deprivation index is 1; otherwise, the index is 0.
	Cooking fuel (1/21)	Households cook by dung/leaves; charcoal or wood, grass and had no improved oven such as *lakech*, *mirt*, *and* the kitchen is not ventilated regarded as deprived and the deprivation index is 1; otherwise, the index is 0.
	Assets ownership (1/21)	Households do not own at least two of the assets namely radio, TV, telephone, bike, motorbike, car, animal cart and refrigerator, the household is regarded as deprived and the deprivation index is 1; otherwise, the index is 0.

Source: Modified and summarized based on Alkire and Santos (2010), Adetola (2014) and Getaneh (2017).

3.2.8. Econometric model

To achieve the last objective of the study, an econometric model called binary logistic regression model were used. According to Hyeoun-Ae, (2013), logistic regression also sometimes called the logistic model or *logit* model analyzes the relationship between multiple independent variables and a categorical dependent variable and estimates the probability of occurrence of an event by fitting data. Binary logistic regression is typically used when the dependent variable is dichotomous and the independent variables are either continuous or categorical. Hence, in this study, the independent variable 'poverty status' is categorical *i.e*. poor or non-poor and some of the independent variable are continuous and the others are categorical. Therefore, the model is appropriate to examine the association of each poverty determinant factors and poverty status of households with proper magnitude.

Model specification

Since the study used several independent variables and one categorical dependent variable the *logit* model is described below (Schuppert, 2009).

$$p(y) = \frac{e^{\ 0+\ 1X1+\ 2X2+...+\ nXn}}{1+e^{\ 0+\ 1X1+\ 2X2+...+\ nXn}} \quad \text{----------(1)}$$

P: probability of Y occurring

e: natural logarithm base

β_0: interception at y-axis

β_1: line gradient

β_n: regression coefficient of X_n

X_1: predictor variable; X_1 predicts the probability of Y.

The odds ratio was determined after the odds of an event were calculated. The odds of an event occurring are defined as the probability of an event occurring divided by the probability of that event not occurring Hyeoun-Ae, (2013). The odds of an event were computed using the model:

$$logit\ (y) = \ln(\text{odds}) = \ln\left[\frac{p}{1-p}\right]$$

$$= \ln \frac{\dfrac{e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n}}{1 + e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n}}}{1 - \dfrac{e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n}}{1 + e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n}}}$$

$$= \ln \left[e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n} \right]$$

$$= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots \beta_n X_n$$

Therefore,

$$p(y) = \frac{e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n}}{1 + e^{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n}} = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_1 + \ldots + \beta_n X_n)}}$$

The odds ratio is a measure of association between an exposure and an outcome. The odds ratio can also be used to determine whether a particular exposure is a risk factor for a particular outcome, and to compare the magnitude of various risk factors for that outcome. When odds ratio =1, it indicates that the exposure does not affect odds of the outcome. On the other hand, when the result of odds ratio >1, indicates that the exposure is associated with higher odds of outcome. Furthermore, when the odds ratio < 1, it indicates exposure is associated with lower odds of an outcome (Hyeoun-Ae, (2013).

The purpose of logistic regression in this study is to explore the most important poverty determinant factors because the model identifies the most significant factors. The method of contrast was employed as this is the standard dummy variable coding method and the first category was the reference category for the categorical variables.

Model diagnostic tests

Before the start of any model analysis, it is essential to attend to the problem of multicollinearity among the selected explanatory variable (Gujarati, 2004). Multicollinearity refers to the case in which two or more explanatory variables in the regression model are highly correlated, making it difficult or impossible to isolate their individual effects on the dependent variable. The presence

of multicollinearity of the explanatory variables which had significant association with poverty were tested using variance inflation factor (VIF) by running linear regression to detect the problem of multicollinearity among explanatory variables. A VIF value greater than 10, which will happen if R^2 exceeds 0.90, indicates presence of severe multicolinearity among the predictors (Gujarati, 2004). The coefficients of all variables in this study were found to be below 10. Therefore, there was no multicollinearity problem among independent variables. Fitness of the model was tested using the Wald statistic at the 0.05 % level of significance so that the model was Significant. The Hosmer and Lemeshow test shows that the model is significant p-value 0.279. Variable selection method is backward selection method by Wald statistic.

3.2.9. Hypothesis and definition of variables

Dependent variable: The dependent variable is household's poverty status (dummy variable, 1 = poor, 0 = non-poor). If the households' deprivation score is 33.3% or higher (the sum of the weighted deprivations) classified as poor, while those with less than 33.3% deprivation score are classified as non-poor.

Hypothetical Poverty determinant factors (independent variables): Explanatory variables which are expected to have relationship with the dependent variable are selected based on related literature and similar scientific research conducted before. Hence, the major independent variables that are expected to affect the poverty status of urban households to be poor or non-poor are discussed below.

Household family size: This is a continuous variable measured by the number of members with in a household. As the family size/total numbers of members increases, the likelihood that unemployment and dependency ratio increases and the amount of consumption increases faster than production. This may leave the household under risks of short fall of basic needs. The non-fulfillment of basic necessities for all members of the household implies being trapped into poverty (Semere, 2008). Hence, it is hypothesized that family size and poverty status are expected to be positively related. On the other hand, large families in developed countries contribute to large labor force which in turn reduces the incidence of poverty. But in developing countries the larger households are associated with high incidence of poverty because many of the labor force are unemployed (Esubaleh A., 2006).

Marital status: Marital status of the household head has economic implication on household's income level. Some pieces of literatures recommend that single headed households have high probability to escape from poverty than married. The assumption is that households headed by married individuals are supposed to be larger in family size. Large families in developed countries mean large labor force which in turn reduces the incidence of poverty. But in developing countries the reverse in most cases holds true in that larger households are associated with high incidence of poverty because many of the labor force are unemployed (Esubaleh A., 2006).

Age: There are different arguments concerning relationship between age and poverty. Some argue that poverty increases at old age. This is because productivity of the individual decreases and the individual has few savings to compensate for the decrease of productivity and income. This is, of course, more likely to be the case in developing countries where savings are low because of low income and at the old age being mostly dependent. On the other side, some others argue that age is correlated with higher productivity and hence impacts welfare positively. There is a third view that neither of the two approaches be correct. This is because the relationship between age and poverty might not be linear, as we would expect that incomes would be low at relatively young age, increases at middle age and then decreases again (Nyanwu , 2013),

Sex of household head: It is widely believed that the gender of the household head significantly influences household poverty and more specifically that households headed by women are poorer than those headed by men (Melese *et al.,* 2017).

Education: there is relationship between the lack of education and poverty that educated labors have opportunities to get employment with good income, conduct businesses and any economic activities based on knowledge that makes them profitable enough.

The dependency ratio: is calculated as the ratio of the number of family members not in the labor force (whether young or old) to those in the labor force in the household. This ratio allows one to measure the extent of burden on members of the labor force within the household. One might expect that a high dependency ratio will be associated with greater poverty. According Semere (2008), a household with large number of dependent members tends to be poorer than those households with small family size because of high dependency burden. Thus, it is hypothesized that a household with relatively large number of dependent members is expected to have a positive relation with poverty.

Household Housing Tenure: Nowadays the issue of house ownership has become a critical parameter of urban dwellers and is assumed to play significant roles in the incidence of poverty. In this study, it is assumed that the probability of households to fall into poverty decreases as they have their own houses and increases if they don’t have. Housing benefit helps prevent

poverty and material deprivation. Rent may affect financial capacity and may lead to poverty traps for tenants (Azomahou, 2014).

Morbidity (health): Since health is the decisive factor for life, one with poor health condition will have a poor living standard. When a bread winner of the household gets sick, it is a known experience that the family faces acute problems and one of which is obviously poverty. Lack of proper health will make people to become weak and unproductive. Health is, therefore, expected to have a positive relation with poverty mean that if there is health problem; the poverty of a household worsens. Considering the negative effects of poor health on the efficiency and effectiveness of human activities, it is generally agreed that labor force productivity is directly linked to the health status of economically active population. Repeated illness or chronic disease reduces the victim's capacity to work and thereby directly influencing the outputs and productive capabilities (CSA, 2012).

Expenditure on health: The costs of health care are important to individuals, especially to poor people, because large out of pocket expenditures can have a major impact on their financial status and can push them into poverty. The cost of illness to individuals and their families can be high forcing them to lose of assets that can cause them to fall into poverty. When people become ill, they frequently have to pay for treatment and for drugs, the costs of which can be substantial share of their income. In addition, illness often leads to a decline in earnings, because people miss work. There are also other indirect costs that people bear when they are ill (Esubalew A., 2006).

Employment: One of the most effective ways to fight poverty among current and future generations is to maintain a full employment economy. When the labor market is strong, it offers increased employment opportunities for those at the bottom. Disadvantaged workers are not only more likely to find employment in a tight labor market but also they are in a better position to secure higher wages as employers are forced to compete for labor. This can allow for millions of workers the opportunity to raise themselves and their families out of poverty (Baker, 2016). With regard to the employment in urban poverty (Eyob and Mark, 2004) found that there is a negative and significant relationship between employment level of the household head and incidence of poverty

Number of persons per room: high levels of household crowding can produce stress that leads to illness; and through shared physical proximity, household congestion contributes to the spread of communicable disease. Regardless of the quality of the accommodation in other respects, crowding and inappropriately high room densities have been shown to have a number of adverse effects on physical health. Crowding has been linked to a number of biological mechanisms that can increase both the risk and the intensity of infection. Crowding is usually measured by the number of individuals of all ages per room (https://www.jrf.org.uk.)

Alcohol Addicted: alcohol has diverse influences on people's economic status while economic status in turn affects alcohol use in many ways. The impact of alcohol on poverty is more than through just the money spent on it. The negative effects of heavy alcohol use and poverty multiply each other when they occur together. A family whose wellbeing is compromised by serious poverty but no heavy alcohol user in it is wholly better off than a family of equivalent economic status but also with a member who is a frequent heavy drinker (Diyanath, 2014).

Credit utilization: is theoretically expected to reduce poverty through cash investment in different productive activities like food sale and to generate better income. Alemayehu *et al*., (2006) found that credit and poverty are negatively related. Therefore, it is expected that the more households utilize credit, the less likely of being under poverty. Households with practice of saving and credit utilization have better chance to escape from poverty because they have good ground to invest on profitable businesses and coping short term market shocks.

Television/radio/ mobile: owning these assets is expected to reduce poverty because households may obtain important market information and learn new methods of production and business from radio/television.

Income: is theoretically expected to reduce poverty by enabling persons pay for their necessities and required services. On the other hand, having good income may reduce poverty through cash investment in different productive activities that can further generate another income and sustain better living condition. Esubalew (2006), made a study on determinants of urban poverty in Amhara region, Debre Markos town and he found that average monthly income is significant determinants of urban poverty among other things.

Table 3.4: Summary of explanatory variables and expected sign.

Explanatory variables	Variable definition	Variables type	Expected sign of MDP poverty
Household size	Size of household	Continuous	+/-
Marital status	Marital status of household head: 0 = single, 1= married, 2 = divorce, 3= widowed.	Nominal	+/-
Age	Ages of household head in year	Continuous	+/-
Sex	Sex of household head: 0 for female, 1 for male. The sign is for female	Dummy	+
Education	Education level of household head:0= not read and write,1= read and write,2= Primary 1st cycle (1- 4 grade),3= primary 2nd cycle (5-8 grade),4= secondary (9-12 grade),5= higher level	Cat dummy	-
Dependency ratio	Number of dependents (not in the labor force)/ labor force of the household	Continuous	+
Household housing tenure	Housing condition of the household (0 = Rented 1= owned). The sign is for owned	Dummy	-
Health problem	Whether there is sick household member at least once over the two months period prior to the date of survey. Yes=1, No=0.	Dummy	+
Expenditure on health	Total amount of expenditure on health in a year before the time of survey	Continuous	+
Alcohol Addicted (Addiction)	Anyone in the household alcohol addicted. Yes =1, No = 0.	Dummy	+
Number of persons	Number of persons per room or crowdedness	Continuous	+
Employment	Occupation of household head; Employed =2, Pensioner = 1 & Unemployed = 0.	Nominal	-
Credit use	Credit utilized for business Yes =1 No = 0.	Dummy	-
Television/radio/ mobile	Television or radio or mobile telephone ownership; Yes =1 No = 0.	Dummy	-
Income	Household's monthly average income in birr	Continuous	-

Note: (+) sign indicates that as the explanatory variable increase, the probability of being MDP increases (the variable worsens poverty). (-) sign shows the inverse relationship that when the explanatory variable increases, the probability of being MDP decreases

3.2.10. Ethical Consideration

The study involved the use of human participants. As a result ethical considerations were taken into account. At the beginning, letter of support was written by Addis Ababa University to Gulomekada *woreda* Administration mentioning that the researcher is carrying out study under the University. On the ground, the *woreda* was informed and permission granted. Then oral informed consent was secured from study participants before data collection. The purpose of the study was explained to the study subjects and participation was on voluntary basis. Study participants were clearly informed that they can withdraw from the study at any time if they need to do so. The right of each respondent to refuse or answer for few or all questions was respected. Names of study participants were not mentioned in the study report to ensure confidentiality.

CHAPTER IV: RESULTS AND DISCUSSIONS

This chapter presents the results of the study and discusses each in detail. The major findings of the study are presented in three sections. The first section deals with descriptive analysis of the demographic and socioeconomic characteristics of the sample households. The second section deals with the extent of MDP (head count ratio, intensity and multidimensional poverty index, raw head count ratio, vulnerability and severity of multidimensional poverty, censored head count ratio and contribution of each indicators and dimensions to multidimensional poverty index). Finally, the third section presents results of econometric model which was employed to see the relationship, direction of association and the effect of the independent/explanatory variables on the dependent variable (i.e MDP status of household).

4.1. Demographic and socioeconomic characteristics of sample respondents

4.1.1. Demographic characteristics of sample respondents

Household demographic characteristics are those variables that give information about the household. These features help to clearly depict the different background of the respondents and the effect this diversity has on the descriptive statistical as well as econometric output. The demographic characteristics of households are defined in terms of sex, age, family size and marital status of household heads as presented in the Tables 4.1 - 4.4. The survey results are presented as follows:

Table 4.1: Sex distribution of the household head

Sex	Study towns				Total	
	Sebeya		Zalambesa			
	Count	%	Count	%	Count	%
Female	16	57.1	94	52.8	110	53.4
Male	12	42.9	84	47.2	96	46.6
Total	**28**	**100.0**	**178**	**100.0**	**206**	**100.0**

Source: Computed based on own survey data of March 2018

The study households were composed of both male and female headed households. As shown in Table 4.1, 46.6% of the total respondents were male-headed; whereas the remaining 53.4 % were

female-headed households. Unlike the study respondents of Getaneh (2017), female-headed households were 30% and male headed households were 70%. It is clear that in this study female headed households are higher than male headed.

With regard to household size, the survey result revealed that the average total family size of sample households was 4.74 persons and the largest and the smallest were 9 and 1 persons respectively at both towns as summarized in Table 4.2. The study town's household size is higher when we compared with the survey conducted by CSA which is 3.9 persons in small town areas of Ethiopia (CSA, 2013).

Table 4.2: Household size of the respondents

Study towns	Count	Minimum	Maximum	Mean	Std. Deviation
Sebeya	28	1	9	5.04	1.80
Zalambesa	178	1	9	4.69	1.81
Total	**206**	**1**	**9**	**4.74**	**1.81**

Source: Computed based on own survey data of March 2018

Another demographic characteristics of the household head surveyed was age. During the survey, it was noted that the mean age of the household head was found to be 39 years in Sebeya and 44 in Zalambesa. This shows that there is 5 years mean age difference between the two towns, Sebeya being the lower in mean age of surveyed households. One can also notice that the median age of household head is 40 in Sebeya and 42 in Zalambesa showing for example 50% of the households are below 40 years and the other 50% are above 40 years in Sebeya. In general, most of the household heads are found to be at productive age.

Table 4.3: Age of the household head

Study towns	Count	Minimum	Maximum	Median	Mean
Sebeya	28	25	54	40	39
Zalambesa	178	23	78	42	44
Total	**206**	**23**	**78**	**42.00**	**43.36**

Source**:** Computed based on own survey data of March 2018

Moreover, the marital status of the household head is presented in Table 4.4. One can observe from Table 4.4, most of the household heads are married in both towns. In fact, the proportion of the married households is higher in Sebeya (67.9%) than it was in Zalambesa (52.8%). In opposite of the lower married percent in Zalambesa when compared with Sebeya, the percent of divorced is higher in Zalambesa (33.7%) than in Sebeya (14.3%). Furthermore, the percent of divorced households of the two towns especially Zalambesa is much higher when one compares with the survey conducted by CSA in 2013 in small towns of Ethiopia that shows average divorced and separated proportion is 3 % (CSA, 2013).

Table 4.4 Marital status of household head

Marital status	Study towns				Total	
	Sebeya		Zalambesa			
	Count	%	Count	%	Count	%
Single	1	3.6	9	5.1	10	4.9
Married	19	67.9	94	52.8	113	54.9
Divorced	4	14.3	60	33.7	64	31.1
Widowed	4	14.3	15	8.4	19	9.2
Total	**28**	**100.0**	**178**	**100.0**	**206**	**100.0**

Source: Computed based on own survey data of March 2018

4.1.2. Socioeconomic characteristics of respondents

The socio-economic characteristics of the study area such as religion, education livelihoods and economic activities are described hereinafter. About 99.22% of the inhabitants in the *woreda* are followers of Ethiopian Orthodox Christianity. This shows that the religion of the people in the study towns is majorly Orthodox Christianity. In fact, the key informants indicate that there are few believers of Catholic Church and very few Muslims in the study towns even they could not put in figure. Concerning language and ethnicity, in both the study towns (i.e. Sebeya and Zalambasa, majority of the people speak Tigrigna language and they are ethnically Tigrians. Similar to the case in language, there are very few people belonging to the Erob ethnic background, speaking both Saho and Tigrigna languages. In addition to this, there are also few migrants speaking Amharic language.

Concerning education, the key informants said that almost all school age children are attending school in both towns. The level of drop out is similarly limited. Actually, there are some reports of drop out especially in Zalambesa though the parents and school committee makes effort to bring the drop outs back to school. On the other hand, some key informants claim that the poor economic activity and inadequate food aid is challenging to school attendance and became a reason for drop out. The survey result of education is summarized in Table 4.5.

Table 4.5: Education level of household head

Education level	Study towns				Total	
	Sebeya		Zalambesa			
	Count	%	Count	%	Count	%
Not read and write	7	25.0	36	20.2	43	20.9
Read and write	4	14.3	28	15.7	32	15.5
Primary 1st cycle (1- 4 grade)	2	7.1	36	20.2	38	18.4
Primary 2nd cycle (5-8 grade)	5	17.9	39	21.9	44	21.4
Secondary (9-12 grade)	5	17.9	18	10.1	23	11.2
Higher education	5	17.9	21	11.8	26	12.6
Total	**28**	**100.0**	**178**	**100.0**	**206**	**100.0**

Source: Computed based on own survey data of March 2018

In this study, the education level of sample respondents are classified into six categories (Table, 4.5) not read and write, read and write, 1st cycle primary education (1- 4 grade), 2nd cycle primary education (5-8 grade), secondary education (9-12 grade) and higher level education categories. Accordingly, the study found that the household heads with 2nd cycle primary (5-8 grades) education level is relatively higher (21.4%). Next to this, the respondents who could not read and write in both the study towns were found to be second highest category (20.9%). In general, the majorities (54.8%) of the household heads were found to be grade 4 complete and lower.

Regarding economic activities, people in both the study towns are engaged in different economic activities. The economic activity of the urban households is mixed including urban/peri-urban agriculture, government employment and self-employment. Some of the major

self-employment economic activities of the people in these towns are petty-trading, preparing and selling of local drinks (such as *tela*, coffee and tea), petty catering services, embroidery (the craft of using needlework to make decorative designs), pottery, carpentry, weaving, traditional hairdressing, hotel services, urban/peri-urban-agriculture, animal cart and shops. As per the key informants and observation during survey, there are no modern manufacturing industries in both towns.

In this study, the economic characteristics of the household heads of the towns are surveyed and described in Tables 4.6.

Table 4.6: Employment status of household head

Employment status	Sebeya		Zalambes		Total	
	Count	%	Count	%	Count	%
Employed	18	64.3	109	61.2	127	61.7
Unemployed	10	35.7	63	35.4	73	35.4
Pensioner			6	3.4	6	2.9
Total	**28**	**100.0**	**178**	**100.0**	**206**	**100.0**

Source: Computed based on own survey data of March 2018

It has been indicated in Table 4.6, that most of the household heads (61.7%) are employed even if unemployment is still pervasive. It is found that among the employed household heads most of them are self-employed (100 household heads = 78.7%) while the share of governmental employees is 18.9 %. Only 2% are employed at NGOs. The self-employed household heads are engaged in different economic activities as shown in Table 4.7.

One third (33.0%) of the respondents are engaged in petty-trade followed by other activities such as urban agriculture, animal cart etc (31.0%). When we look at the study towns, most of the households (33.3%) in Sebeya was engaged in preparing and saling of local drinks and others activities such as urban agriculture, animal cart etc accounts another 33.3%. More or less in the same way, in Zalambesa most of the households are engaged in petty-trade 36.5% and 30.6% participated in other activities such as urban agriculture, animal cart etc. In general, majority of the households are engaged in petty-trade as indicated in Table 4.7.

Table 4.7: Type of jobs for self-employed household heads

Job category	Sebeya		Zalambes		Total	
	Count	%	Count	%	Count	%
Petty-trade	2	13.3	31	36.5	33	33.0
Preparing and sale of local drinks	5	33.3	16	18.8	21	21.0
Sale of food			4	4.7	4	4.0
Handicraft (embroidery, pottery)	2	13.3	3	3.5	5	5.0
Hotel service	1	6.7	5	5.9	6	6.0
Others (urban agriculture, animal cart etc)	5	33.3	26	30.6	31	31.0
Total	**15**	**100.0**	**85**	**100.0**	**100**	**100.0**

Source: Computed based on own survey data of March 2018

During the survey period, respondents were asked to respond to issues related with, whether they take credit for business or not, if there was health problem during the last 2 months, whether there is any addiction to alcohol or drugs in the family, whether the households have television/radio/ mobile and housing tenure. Accordingly, out of the total respondents 35.9% stated that they used credit while the majority 64% explained they do not used credit. Concerning health problem during the last two months from survey time, majority (75.2%) of the respondents were found not had had any major health problems. It is also found that no alcohol or drug addiction in Sebeya while 11.2% of the respondents were found to have addicted in Zalambesa. Most of the alcohols they are using seem to be local drinks (mostly *tela i.e.* local beer). It is also found that majority (94.7%) of the respondents have information support technologies like television/radio/ mobile. In addition to this, the majority of respondents are appeared to be house renters (53.4%) while 45.1% were private house owners.

Table 4.8: Access to credit service, health problem, addiction, television/radio/ mobile and housing tenure of the respondents

Access to credit service	Sebeya		Zalambes		Total	
	Count	%	Count	%	Count	%
No	20	71.4	112	62.9	132	64.1
Yes	8	28.6	66	37.1	74	35.9
Total	**28**	**100.0**	**178**	**100.0**	**206**	**100.0**
Health problem during the last 2 months						
No	22	78.6	133	74.7	155	75.2
Yes	6	21.4	45	25.3	51	24.8
Total	**28**	**100.0**	**178**	**100.0**	**206**	**100.0**
Addicted to alcohol or drug						
No	28	100.0	158	88.8	186	90.3
Yes	0	0.0	20	11.2	20	9.7
Total	**28**	**100.0**	**178**	**100.0**	**206**	**100.0**
Television/radio/ mobile						
No	0	0.0	11	6.2	11	5.3
Yes	28	100.0	167	93.8	195	94.7
Total	**28**	**100.0**	**178**	**100.0**	**206**	**100.0**
Housing tenure						
Privately owned	18	64.3	75	42.2	93	45.1
Rent	9	32.1	101	56.7	110	53.4
Other	1	3.6	2	1.1	3	1.5
Total	**18**	**64.3**	**178**	**100.0**	**206**	**100.0**

Source: Computed based on own survey data of March 2018.

Similarly, during the survey period, respondents were asked to respond to issues related with, household's expenditure on health, persons per room, dependency ratio and household's monthly income. Accordingly, the field survey data of both towns together indicated that the mean of expenditure on health was 458.95Birr with the standard deviation of Birr 526.4. The minimum and maximum expenditure was birr 45 and birr 5000 respectively. Regarding persons per room which was measured by the number of individuals of all ages per room, the study found that the

mean of persons per room was 2.9 with standard deviation of 1.4 with the minimum 0.33 (this indicates 1 person having 3 rooms) and maximum 8. The mean of dependency ratio for the sample household which is calculated by the number of family members not in the labor force (the dependent part ages 0 to 14 and 65+) divided by those in the labor force (the productive part ages 15 to 64) in the household was 1.1 with standard deviation of 0.89 and minimum 0.00 and maximum 5.00. The mean households' monthly income was 936.25Birr with minimum of 100 Birr and maximum of 5,000 Birr.

In fact, as per the key informant interview data almost all the populations living in the towns are dependent on food aid because of their poor economic performances owning to erratic rainfalls, degraded environment, adverse impact of the Ethio-Eritrea wars and vicinity to Ethio-Eritrea conflictive border area. Moreover, the rural-urban linkage is poor as the rural people providing almost nothing to the urban dwellers as the rural people do not produce surplus agricultural outputs and as well as the urban market is also not as such serving the rural community towns because they have limited service to provide to the rural due to above mentioned reasons. The Situation is more adverse in Zalambesa because half of its rural vicinity is Eritrean place that there is no economic and social relationship. The other half vicinity (nearby) rural area prefers to get basic consumable commodities from Fatsi (the administration town of the *woreda*) or another nearby town Dewahan found at Erbo *woreda* instead of marketing at Zalambesa or Sebeya.

It is known that Zalambesa was damaged during Ethio-Eritrea war in 1998 as shown in the partial view of Sabeya, Zalambessa and the environs in Figure 4.1. In fact, public services are reconstructed and there are banking, telecommunications, schools, 24 hours electric power supply and potable water service at present. The houses of dwellers are made of trachyte and sandstone. The infrastructure for electric and water is there. However, there is limited access of electricity and water supply as witnessed by almost all the key informants in both towns. There is a frequent failure of electric supply and water services for most of the time at both towns.

In Zalambesa, electric supply fails at list two full-days per week. More adversely, there is limited availability of potable water. Electric power is required to supply Water. As a result, water supply is interrupted when electric supply fails. The 4 *ketenas* get water by shift that to the extent

the availability of water is one day per week. This is adversely affecting the sanitation, food preparation and business activity of the people.

Similarly in Sebeya, there is infrastructure limitation particularly the electric supply has no enough power and failure of electric supply is high. In relation to this, the respondents are complaining that the electric supply has no adequate power for cooking, lighting and businesses like photocopy services, woodwork, and metalwork. Water line network supply is very limited in the town indicating that only few household have access to private tap. Some of the people use private tap and some others use communal tap even its availability is limited. On average a household gets water for two days per week. When the water is off, the dwellers are required to walk greater than 1 km distance to fetch water. Even when the water supply is available, some few dwellers fetch water from greater than 1 km due to limited water pipe networks. Similarly, this situation is affecting the sanitation, food preparation and business activities of the people. Key informants stressed that small and micro-enterprise are unable to operate adequately on their businesses due to failure of electric city and limited power when available.

Figuer 4.1: Partial view of Sabeya, Zalambesa and the environs

4.2. The extent of multidimensional poverty in Sabeya and Zalambessa towns

The MPI reflects both the headcount ratio (H) of poverty that is the proportion of population that is multidimensionaly poor and the average intensity (A) of their poverty that is average proportion of indicators in which poor people are deprived. The MPI is calculated by multiplying the incidence of poverty by the average intensity across the poor (H×A). A person is identified as poor if s/he is deprived in at least one third of the weighted indicators. To achieve the first objective of this study, the multidimensional poverty rate (MPI) and its two components:

incidence of poverty (H) and average intensity of deprivation faced by the poor (A) are analyzed and described below.

4.2.1. Head count ratio, intensity and multidimensional poverty index

Head count ratio: as it has been indicated the conceptual literature and method parts of this research, head count ratio is the proportion of people who experience multiple deprivations (Alkire et al:, 2015). It computed based the formula shown below:

$H = \frac{q}{n}$, where H is head count ratio, q is number of poor persons, and n total persons living in the sample households.

Based on the definition and the specific formula for the analysis, the overall percentage of people who are multidimensionaly poor in the study towns was found to be 31.4%. This result was found by adding up the number of poor of the two towns and dividing by the total population living in the households of the respondents of the two towns. This means, almost one third of the society in the study towns was deprived in multiple indicators at the same time. Just for comparison, the headcount ratio of the multidimensional poverty of the study towns was different with the head count ratio of the three towns of East Gojam Zone which accounts 55% (Getaneh, 2017) and with the headcount ratio of the multidimensional poverty of urban areas of Ethiopia which accounted for 46.4% in 2013 (OPHI, 2013). Regarding the headcount ratios of each study town, it was different in Sebeya and Zalambesa. The headcount ratio in Sebeya accounted for 50.4% which is higher than the head count ratio of urban Ethiopia 46.4% and 43% Yetmen town (East Gojam). In Zalambesa the incidence of multidimensional poverty accounted for more than quarter of total persons living in the respondent households, that is to say 28.1% showing that the head count ratio was much higher in Sebeya than the case in Zalambesa.

Intensity: similarly, as it has been indicated at conceptual literature and method parts of this research, intensity reflects the proportion of the weighted component indicators in which, on average, poor people are deprived and computed based on the formula as shown below.

$A = \frac{\sum_{i=1}^{q} Ci}{q}$, Where Ci is the deprivation score that the i[th] poor person experiences, q is the number of people who are multidimensionaly poor.

So, the study revealed that on average multidimensional poor person is deprived in 46.4% of the weighted indicators. This implies that the poor in the study towns are deprived on average around half of the weighted indicators. This intensity is almost similar with the small towns of east Gojam zone which accounted for 46.7% in 2017. When one looks the intensity of multidimensional poverty in each study towns, it is found to be 47.5 % in Sebeya which is similar with the study conducted by Getaneh, 2017 in Wojel 48% and 46.1% in Zalambesa which is similar with the multidimensional poverty intensity of Yetmen and Felege Birhan 46%. In general, the head count ratio (incidence) of each town has showed big difference. However, the intensity of multidimensional poverty was nearly the same in both towns. This shows that, the multidimensional poor are deprived by nearly equal weighted indicators in both towns.

Table 4.9: Multidimensional poverty index (MPI)

Number of persons and Indices	Study towns		Total/overall
	Sebeya	Zalambesa	
Number of non-poor persons	70	600	670
Number of poor persons (q)	71	235	306
Total (n)	141	835	976
$\sum Ci$ (Sum of deprivation score of the poor)	33.69	108.33	142.02
Head count ratio (H) = (q/n)	0.504	0.281	0.314
Intensity of poverty (A) = $\sum Ci(k)/q$	0.475	0.461	0.464
Multidimensional poverty index (MPI) $MPI = H * A$	0.238	0.130	0.146

Source: Computed based on own survey data of March 2018

Multidimensional poverty index (MPI): as discussed in the literature and method part of this study the MPI reflects the multiple deprivations that people face at the same time and described as a measure of "acute" poverty. MPI is calculated by multiplying the incidence of poverty by the average intensity of poverty across the poor (MPI = H x A). As a result, the MPI reflects both the share of people in poverty and the degree to which they are deprived as indicated by Alkire and Santos, 2014.

Accordingly, the overall MPI of the study towns was found to be almost 15%. This revealed that on average the study population is deprived by about 15% out of the total potential deprivations. To elaborate it more, 15% is the MPI for the two towns when viewed together showing that the poor people in Zalambesa and Sebeya are deprived in 15% of the deprivations from the potential deprivation that would be experienced if every person in the towns were poor and were deprived in all indicators. It should be noted at this point that MPI ranges from 0 to 1 and higher levels show higher poverty.

The parentage point of MPI for each study town was 23.8% and 13% for Sebeya and Zalambesa respectively. The MPI of Sebeya was higher than Zalambesa. Just for comparison, the MPI of Sebeya was higher than the MPI of Yetmen (19%) and lower than the MPI of Felege Birhan (26%) and Wojel (30) as reported by Getaneh (2017).`

Generally, the result shows that in Sebeya town, there is high level of acute multidimensional poverty and more or less similar with East Gojam towns studied by Getaneh, (2017). However, in Zalambesa it is lower when one compares with the level of multidimensional poverty in the urban areas of East Gojam towns studied by Getaneh, (2017). The possible reasons for this relatively lower level of acute multidimensional poverty could be due to the changing of deprivation cut-off made in this study as described hereunder.

- Year of schooling as an indicator is taken differently from that of Getaneh (2017) and global MPI, that is to say Getaneh has taken year of schooling of Grade 6 and Global MPI considers Grade 5 and in this current study (at Gulomekeda *woreda),* it was contextualized and taken as Grade 4 complete taking into consideration that most elderly persons may not have received formal education as in most areas of Ethiopia.

- In this study, the improved sanitation indicator has been contextualized and a bit modified than what has been used in Global MPI. According to Global MPI, 'a household is considered to have access to improved sanitation if the household had some type of flush toilet or latrine, or ventilated improved pit or composting toilet, provided that they were not shared'. However, in this study, only the sharing of toile is modified in a case that if the toilet is shared by greater than one household in the same compound, the households are not considered as deprived. It is only considered as deprived, if the toilet is shared by out siders of the compound or if the toilet is communal to the society at large in the area.
- In this specific study at Gulomekeda *woreda,* the replacement of one health indicator which is 'nutrition' as per Global MPI or 'daily calorie intake' as per Getaneh, (2017) by 'seriously ill' (disability and morbidity) in this study.

Had these modifications not been made based on local situations in this specific study, the poverty level might have been higher than the obtained poverty level results in both towns. Beyond this, the relatively lower multidimensional poverty level at Zalambesa might be the reflection of the reconstruction of housing and infrastructure after it has been devastated during Ethio- Eritrea war that the majority houses are non-deprived of flooring material and infrastructures such as water source are constructed even if its availability is very limited. Nevertheless, even if the multidimensional poverty level is lower at Zalambesa when compared with Sebeya town, still the 28.1% poor people with MPI 13% is considerable showing existence of greater than quarter multidimensionaly poor people.

4.2.2. Contribution of indicators and dimensions to overall MPI

The multidimensional poverty indices are decomposed based on the indicators in order to identify the highest and lowest contributor to the MPI of the people in the study towns. According to Alkire & Santos, (2011), first one can determine censored head count ratio to determine the contribution of indicators to MPI. Censored headcount ratio is the proportion of people who are multidimensionaly poor and deprived in each of the indicators and obtained by adding up the number of people who are poor and deprived in that indicator and dividing by the

total population. So, contribution of indicator i to MPI $= \frac{WiCHi}{MPI} * 100$ Where, Wi is weight of indicator i and CHi is censored headcount ratio.

As indicated in Table 4.10, the highest contributors to the MPI were years of schooling (32.51%) followed by seriously ill (disability and morbidity) (23.94%). The least contributors are water source (1.58%) and child mortality 2.11%. With respect to contribution of individual indicators to the MPI of each study towns, the highest and first contributor to MPI is year of schooling with contribution percentage of (33.86%) in Zalambesa and (28.20%) in Sebeya towns followed by seriously ill contributing (26.16%) in Zalambesa and (16.82%) in Sebeya. The least contributor in both towns is found to be water source with 1.06% contribution in Zalambesa and 3.25% in Sebeya. However, it should be noted that even if water source has appeared to be the least contributor due to the existence of infrastructures such as pipe lines, there is also availability problem as discussed under socioeconomic section of this research report. The second least contributor is child mortality (1.39%) in Zalambesa and Child school attendance (3.46%) in case of Sebeya.

One can estimate the contribution of each dimension by adding up the contribution of each indicator with in the dimension. Therefore, education contributed 38.85 % which is the principal contributor followed by living standard that has contributed 35.11% deprivation. Health is the last contributor weighing in about 26.05% deprivation. Similarly, education and living standard are the largest contributor dimensions to the MPI of each study towns. Education was found to be the largest contributor in Zalambesa accounting for about 41.09% of deprivation and living standard was found contributing about 31.4%; while in Sebeya, living standard was found contributing the largest share (about 47.09%) and education is weighing 31.66% of deprivation.

Table 4.10: Censored head count ratio and contribution of indicators and dimensions to overall MPI

Dimension	Indicators	Zalambesa				Sebeya				Total			
		Sum of poor persons & deprived by indicator	CHi	Wt of indicator	Contr(%)	Sum of Deprived persons by indicator	CHi	Wt of indicator	Contr(%)	CHi	wt*CHi	Contr (%)	Dimension Cont
Education	Year of schooling	220	0.263	0.167	33.86	57	0.404	0.167	28.20	0.284	0.047	32.51	38.85
	Child school attendance	47	0.056	0.167	7.23	7	0.050	0.167	3.46	0.055	0.009	6.34	
Health	Seriously ill (disability and morbidity)	170	0.204	0.167	26.16	34	0.241	0.167	16.82	0.209	0.035	23.94	26.05
	Child mortality	9	0.011	0.167	1.39	9	0.064	0.167	4.45	0.018	0.003	2.11	
Living Standard	Water source	24	0.029	0.048	1.06	23	0.163	0.048	3.25	0.048	0.002	1.58	35.11
	Improved sanitation	101	0.121	0.048	4.44	63	0.447	0.048	8.91	0.168	0.008	5.50	
	Electricity	85	0.102	0.048	3.74	48	0.340	0.048	6.79	0.136	0.006	4.46	
	Room flooring	113	0.135	0.048	4.97	48	0.340	0.048	6.79	0.165	0.008	5.40	
	Room density	138	0.165	0.048	6.07	55	0.390	0.048	7.78	0.198	0.009	6.47	
	Cooking fuel	167	0.200	0.048	7.34	71	0.504	0.048	10.04	0.244	0.012	7.98	
	Assets ownership	86	0.103	0.048	3.78	25	0.177	0.048	3.53	0.114	0.005	3.72	

Source: Computed based on own survey data of March 2018.

Note that 'CH_i' stands for censored head count ratio of each indicator

4.2.3. Raw head count ratio

As it has been indicated in the literature review part of this research, raw head count ratio is simply the percentage of households deprived in a particular indicator regardless of the category of a household as multidimensionaly poor or non-poor (Alkire and Santos, 2010). This ratio shows the deprivation rates (percentage) of the respondents in each poverty indicator selected for this research. This includes year of schooling, child school attendance, seriously ill (disability and morbidity), child mortality, water source, improved sanitation, electricity, room flooring, room density, cooking fuel and assets ownership. Accordingly, the result in Table 4.11 shows those majorities of households in Sebeya are deprived of cooking fuel and improved sanitation which accounts for 67.9% and 60.7%, respectively while the raw head count ratio of child school attendance is small, that is to say only 3.6% of the total respondents. Unlike to Sebeya, in Zalambesa, the raw head count ratio of year of schooling deprivation is the highest accounting for 62.9%; while raw head count ratio of child mortality was very small, that is only 1.1% of the respondents. When one looks into the overall deprivation of each indicator, year of schooling is found to be the highest; with deprivation percentage of 61.7% of the respondents. In other words the analysis indicates that 61.7% of the households in both study areas are deprived by year of schooling. In general, one can easily notice that there is high range of deprivation percentage difference among the indicators as displayed in Table 4.11.

Table 4.11: Raw headcount ratios of households in the selected indicators

Poverty Dimensions	Indicators	Study towns					
		Zalambesa		Sebeya		Total	
		Count	%	Count	%	Count	%
Education	Year of schooling	112	62.9	15	53.6	127	61.7
	Child school attendance	10	5.6	1	3.6	11	5.3
Health	Seriously ill (disability and morbidity)	47	26.4	6	21.4	53	25.7
	Child mortality	2	1.1	3	10.7	5	2.4
Livening Standard	Water source	9	5.1	11	39.3	20	9.7
	Improved sanitation	34	19.1	17	60.7	51	24.8
	Electricity	26	14.6	13	46.4	39	18.9
	Room flooring	30	16.9	14	50.0	44	21.4
	Room density	54	30.3	15	53.6	69	33.5
	Cooking fuel	60	33.7	19	67.9	79	38.3
	Assets ownership	44	24.7	6	21.4	50	24.3

Source: Computed based on own survey data of March 2018

4.2.4. Households' vulnerability and severity of multidimensional poverty

As indicated in literature review of this study, if a person is deprived in 20-33.3% of the weighted indicators they are considered *'vulnerable to poverty'*, and if they are deprived in 50% or more, they are identified as being in *'severe poverty'*. In addition to this, *'not vulnerable to poverty'* and *'less severe to poverty'* are also analyzed.

Hence, as showed in Table 4.12, households in severe multidimensional poverty were found to be 9.2%. This means, as per the technique of analysis of severity of poverty indicated hereinbefore, the 9.2% (19 households) of the total respondents, were deprived by over 50% of the weighted indicators used in this analysis. Looking into the individual towns, the proportion of households in severe multidimensional poverty were 14.3% in Sebeya and 8.4% in Zalambesa indicating that there is more multidimensional poverty severity in Sebeya. With respect to the

'*less poverty severity category'* out of the total households surveyed, 21.4% of the households were less severe as they lack between 33% and 50% of the weighted indicators. The proportion of households that were in less multidimensional severity was similarly much higher in Sebeya (35.7%) than the case in Zalambesa (19.1%).

Concerning *'the not vulnerable to poverty'* category, 48.5% were not vulnerable to multidimensional poverty as displayed in Table 4.12. There were differences in the percentage of *'not vulnerable category'* households in the study towns. In Zalambesa 51.1% of households were not vulnerable to poverty; while the value is 32.1% in case of Sebeya.

Table 4.12: Households' vulnerability and severity of multidimensional poverty

Vulnerability and severity	Zalambesa		Sebeya		Total	
	Count	%	Count	%	Count	%
Not vulnerable (C_i< 20%)	91	51.1	9	32.1	100	48.5
Vulnerable (33.3 < C_i >= 20%)	38	21.4	5	17.9	43	20.9
Less severe poverty (50% < C_i > = 33.3%)	34	19.1	10	35.7	44	21.4
Severe poverty (C_i >=50%)	15	8.4	4	14.3	19	9.2
Total	**178**	**100.0**	**28**	**100.0**	**206**	**100.0**

Source: Computed based on own survey data of March 2018

4.2.5. Multidimensional poverty by demographic profile of the households

The multidimensional poverty profiles of household heads by their demographic profile (including sex, marital status, age and size of households) are discussed hereinafter. In the study towns, the total multidimensional poor household heads are 30.6%; whereas the remaining 69.4% household heads were found to be not multidimensionaly poor as indicated in Table 4.13.

Table 4.13: MDP status of the household heads

MDP status	Count	%
Non poor	143	69.4
poor	63	30.6
Total	**206**	**100.0**

Source: Computed based on own survey data of March 2018

4.2.5.1. Multidimensional poverty by sex, age and marital status of the household heads

Concerning the profile by sex of the household heads, over 63.5% multidimensional poor household heads were female headed households while 36.5% multidimensionaly poor household heads were male headed. It is found that the majority of multidimensionaly poor households in Sebeya were female headed (78.6%) while the multidimensionaly poor male headed households were around one fifth (21.4%). Similarly, the proportion of multidimensional poor female headed in Zalambesa was relatively higher (59.2%) than the male headed households (40.8%) even if the difference is not exaggerated like the case in Sebeya. In general, in both the study towns male-headed households are less likely to be multidimensional poor than female-headed households.

Table 4.14: MDP by Sex, marital status and age of household head

Sex, age and marital status	Zalambesa				Sebeya				Total			
	Non- poor		poor		Non- poor		Poor		Non- poor		Poor	
	Count	%	Count	%	Count	**%**	Count	%	Count	**%**	Count	%
Female	65	50.4	29	59.2	5	35.7	11	78.6	70	49.0	40	63.5
Male	64	49.6	20	40.8	9	64.3	3	21.4	73	51.0	23	36.5
Total	**129**	**100.0**	**49**	**100.0**	**14**	**100.0**	**14**	**100.0**	**143**	**100.0**	**63**	**100.0**
Single	9	7.0	0	0.0	1	7.1	0	0.0	10	7.0	0	0.0
Married	73	56.6	21	42.9	12	85.7	7	50.0	85	59.4	28	44.4
Divorced	38	29.5	22	44.9	1	7.1	3	21.4	39	27.3	25	39.7
Widowed	9	7.0	6	12.2	0	0.0	4	28.6	9	6.3	10	15.9
Total	**129**	**100.0**	**49**	**100.0**	**14**	**100.0**	**14**	**100.0**	**143**	**100.0**	**63**	**100.0**
Age category												
23-29	8	6.2	1	2.0	2	14.3	0	0.0	10	7.0	1	1.6
30-64	117	90.7	44	89.8	12	85.7	14	100.0	129	90.2	58	92.1
>64	4	3.1	4	8.2	0	0.0	0	0.0	4	2.8	4	6.3
Total	**129**	**100.0**	**49**	**100.0**	**14**	**100.0**	**14**	**100.0**	**143**	**100.0**	**63**	**100.0**
Mean age	**43.54**		**45.37**		**36.93**		**41.14**		**42.9**		**44.43**	

Source: Computed based on own survey data of March 2018

With respect to the multidimensional poverty and marital status of household heads in the study area, the poor households headed by married persons constituted 44.4% while the divorced accounts for 39.7%. It is found that all the singles are non-poor. The result indicates that households headed by divorced and widowed are more likely to be multidimensional poor than households headed by married and unmarried. One can see from Table 4.14 that from the poor population 39.7% and 15.9% are divorced and widowed respectively showing only the two categories account 55.6% of the poor households. The divorced multidimensionaly poor households were higher in Zalambesa (44.9%) than the case in Sebeya (21.4%) among the poor in individual town. On the other hand, the majority of the non-poor are married (59.4%).

Regarding the age of household heads, the majority are at the age range of 30-64 years old. Based on MYSC, (2004) classification of age, persons at the age of 15-29 years old are youth. CSA has also classified persons in between age of 15 and 64 as productive and above 64 years

old are elderly (CSA, 2013). In this study the minimum age of the household head was found to be 23 years. So the age category of the household head was categorized in to three as shown in Table 4.14. Accordingly, the multidimensional poverty based on the age of the household heads, the majority of the poor (92.1%) are the households headed by age range of 30-64 years. On the other hand, the majority of non-poor (90.2%) among the total non-poor were headed by ages in the age category of 30-64 in both the study towns. Actually, the mean age of household heads was found to be 43.36 years with the median of 42 years. As can be seen in Table 4.3 in demographic profile section of this study report, the majority of household heads were found in the age range of 30-64 years whether they are poor or non-poor. Household heads, at the age of 23-29 years old are found to be more of non-poor (number of respondents = 10 *i.e.* 7% of the total). The poor household heads at the age of 23-29 years old accounts only 1.6% with n = 1 from the total poor.

As can be seen in Table 4.14, the average ages of heads of the multidimensional poor and non-poor household were 44.43 and 42.9 years old respectively showing that the mean age of the poor and non-poor is nearly equal. These imply that age of the household heads has no significant association with multidimensional poverty in the study towns. The absence of statistically significant association between age of the household heads and multidimensional poverty was also confirmed by Pearson's Chi-Square (2) = 3.831, P=0.147 which is > 0.05.

Table 4.15: MDP by household size

Household Size	Zalambesa				Sebeya				Total			
	Non-poor		Poor		Non-poor		Poor		Non-poor		Poor	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
1	8	6.2	0	0.0	1	7.1	0	0.0	9	6.3	0	0.0
2	8	6.2	2	4.1	0	0.0	0	0.0	8	5.6	2	3.2
3	20	15.5	8	16.3	3	21.4	1	7.1	23	16.1	9	14.3
4	27	20.9	12	24.5	3	21.4	4	28.6	30	21.0	16	25.4
5	24	18.6	12	24.5	1	7.1	5	35.7	25	17.5	17	27.0
6	19	14.7	8	16.3	1	7.1	2	14.3	20	14.0	10	15.9
7	13	10.1	5	10.2	4	28.6	1	7.1	17	11.9	6	9.5
8	7	5.4	2	4.1	0	0.0	1	7.1	7	4.9	3	4.8
9	3	2.3	0	0.0	1	7.1	0	0.0	4	2.8	0	0.0
Total	**129**	**100**	**49**	**100**	**14**	**100**	**14**	**100**	**143**	**100**	**63**	**100**
Mean size	4.65		4.80		5.00		5.07		4.69		4.86	

Source: Computed based on own survey data of March 2018

Data on the poverty profiles by the household size are presented in Table 4.15. Out of the total multidimensional poor households, 27% were households with family size of five whereas 21% of the multidimensional non-poor households were a household size of four. The disaggregated data by the study towns showed that all households with family sizes of 1 and 9 are found to be all non-poor.

The proportion of the multidimensional poor was higher than the proportion of the multidimensional non-poor households from the household size of four to six; whereas the proportion of the poor households was less than the proportion of the non-poor households from the household size of one to three and seven to nine (Table 4.15). In general, it seems that small size households and very large size households are less likely to be multidimensionaly poor than medium size households in the study towns. This result might show that the small size households are relatively non-poor due to their small family size and/or due to less number of consumers in the household. However, the reason for the larger family size to become non-poor may be due to the existence of some productive youngster members that can support the household in various economic activities, enabling the household to secure more income.

Opposite to this, the medium family size is found to be proportionally poor that might be due to the existence of 4 to 6 members all or the elders once are at school and may not support their family.

4.3. Econometric results of the determinant of poverty

As specified in the methodology part of this research, determinants of multidimensional poverty were analyzed using binary logistic regression model. This model was used to identify the influence of household's demographic, socioeconomic and institutional variables on poverty. Identification of the descriptive and inferential statistics alone may not be enough to stimulate policy actions unless the influence of each determinant factor to poverty is known for priority based intervention. It is obvious that before discussing the econometric model results, the model specification and data fitting has to be made. Hence the Hosmer and Lemeshow test was carried out and the result revealed that the model is significant (p-value 0.279, χ^2 test = 9.808, significant at 5% level of significance) as indicated in Table 4.16, showing that the model is adequately fitted the data.

Table 4.16: Hosmer and Lemeshow *test*

Chi-square	df	Sig.
9.808	**8**	**0.279**

Source: Computed based on own survey data of March 2018

After showing that the model is significant, the results of the logistic regression are presented in Table 4.17. As exposed in the Table, five out of the explanatory variables are found to have significant association with poverty and became the most important predictors of poverty as the p-values for the coefficients of these variables were less than 0.05. It should be noted that the statistically significant determinants of poverty in the study towns were identified using the backward selection method in binary logistic regression.

Table 4.17: Estimation results of binary *logit* model

Variables	B	S.E.	Wald	df	*Sig*.	Odds ratio
Family size	-0.768	0.337	5.187	1	0.023	0.464
Addiction	-3.500	1.581	4.902	1	0.027	0.030
Health problem	-5.853	1.146	26.071	1	0.000	0.003
Expenditure on health	-0.002	0.001	3.913	1	0.048	0.998
Person per room	1.239	0.398	9.716	1	0.002	3.453
Constant	3.739	2.423	2.381	1	0.123	42.050
Hosmer & Lemeshow						0.279

Source: Computed based on own survey data of March 2018

Correspondingly, as indicated in Table 4.17, family size, addiction, health problem, expenditure on health and person per room were identified as significant predictors for household poverty.

Family size: family size is the demographic variable that has strong explanatory power with regards to poverty status analysis at household level. The odds ratio of the family size indicated that as the size of the household increases by one unit (1 person) the likelihood to be poor decreases by 0.54 (54%). This could be because of the existence of some productive youngster members that can support the household contributing to large labor force which in turn reduces the incidence of poverty. Considering the lower economic activities in the towns, the result seems unexpected. However, the reason may be the combination of two things i.e. big family size gets advantage of food aid as per their number plus some economic activities they made helps the family to live out of poverty. Regardless of the limited economic activities of the area, most youngsters in the area were found engaged in pity trade, hand craft, tea and coffee sale, a few are engaged in micro and small enterprise earning some amount of income for the household.

Addiction: Another variable which had significant association with poverty status of household was addiction. The odds ratio of this predictor revealed that the non-addicted persons' likelihood of being poor is 97% less than the likelihood addicted persons of being poor.

Health problem: the odds ratio (0.003) implies that the probability of being non-poor increases by 99.7% for persons having no health problem. In other words, the odds ratio (0.003) implies that the probability of persons having no health problem to become poor is 99.7% less likely to become poor. On the other hand, the odds ration indicates that household persons having health problem are 99.7% more likely to be poor than persons with no health problem. This shows that health highly affects the level of poverty of individuals by removing them mainly from business activities or by making them to expend more money to maintain their health.

Expenditure on health: expenditure on health was found a statistically significant predictor of poverty having a slight adverse impact over households' likelihood of poverty. When the expenditure on health increases by one unit (1 birr), the likelihood of a household to be poor, decreases by 0.02%. In more clear words, a 100 birr expenditure on health signifies a decrease in

2% of the likelihood to be poor for an individual or a household. The value 0.048 in Table 4.17, a significance level for this predictor, shows the predictor is relatively less significant when compared with the other predictors. As a result, from the identified five top poverty determinant factors, expenditure on health is found to be the least predictor. Regardless of the relatively lower relationship between poverty and expenditure on health, the negative direction shows that persons expending money to keep their health are found to be at better position of tackling poverty than the one who is not expending on health. This might be due to the on time medication and prevention of further illness that keeps them stay in productive activities. But opposite to this result, the literature part of this study shows that when expenditure on health increases and reaches to the extent of forcing sale of assets for health expenses, the probability of a household to be poor increases. So the expenditure on health will not help to decrease poverty if the expenditure goes much higher and forces household's sale their fixed asset and the health problem continues unimproved. As far as the expenditure on health helps the household improve their health and makes them continue in their economic productive activities, the likelihood of a household or a person to be poor decreases as this result shows.

Person per room: Crowding is measured by the number of individuals of all ages per room. As hypothesized, the result shows that the variable is found to have positive impact on the probability of being poor in the study area. The odds ratio for the persons per room (crowdedness) showed that as persons per room increases by one unit (one person) the probability of being poor increases by more than 3 fold. This might be due to the case that high levels of household crowding can produce stress that leads to illness; and through shared physical proximity, household congestion contributes to the spread of communicable disease.

CHAPTER V: CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusion

This study is made at two non-capital towns namely Zalambesa and Sebeya which are found at Gulemekada *Woreda* East Zone of Tigray aiming at investigation of extent and determinants of multidimensional poverty. In parallel to the achievement of the aim of the research, the characteristics of the *woreda* is reviewed and found that the *woreda* is drought prone, moisture stressed, deforested and with small agricultural land owners.

At the beginning of the study, it was mentioned that non capital towns are less advantageous than capital towns. The study has also shown that the availability and accessibility of infrastructure such as water availability and electricity is limited. There is repeated failure of supply of electricity and water at both study towns.

In the study towns, the sample has proved that the proportion of female headed households is greater than the male and considerable proportions are divorced, to the extent of 31.1%. It is interesting that most of the populations are at productive age but there is high unemployment rate that ranges up to 35.4%. Furthermore, the common economic activities in the study towns are found to be petty trade and urban agriculture. The other issue discovered in this study is the proportion of poor and non-poor and at which group of people is the poor higher. Accordingly, proportionally female headed households are on average poorer than male headed households. Similarly, almost all the poor households are in between age of 30 and 64. In terms of family size, the majority of the poor are on average households having 3 to 6 family size while households with 1 or 2 and above 6 are proportionally decrease the existence of poor households.

In line with the specific objectives of the study, the following conclusions are pointed out. The findings indicated that there are considerable multidimensional poor people in both study towns. Hence, the proportion of multidimensional poor people in Sebeya was more than half and in Zalambesa was more than quarter and the poor persons are deprived on average near half of the weighted indicators. The level of multidimensional poverty can practically be higher than the above indicated result in both study towns had this study followed strictly multidimensional

poverty indicators as per global MPI and had not modifications made based on local situations. It is also noticed that there is low economic activities in both study towns due to on border and nearby border location of Zalambesa and Sebeya respectively. This low economic activity is additional evidence for the existence of high poverty.

The contribution of each multidimensional poverty indicators to multidimensionaly poor people was not equivalent among each other. Some of the multidimensional poverty indicators have taken a lion share in contributing to multidimensional poverty. The highest percentage deprivation contributor from the selected multidimensional poverty indicators were year of schooling from education dimension and illness from health dimension contributing 32.5% and 23.9% respectively. It is also found that the main multidimensional poverty determinants factors in the study area are family size, addiction, health problem, expenditure on health and person per room (crowdedness).

5.2. Recommendations

It may be difficult to put recommendations for all the findings of the study. Hence, based on the major results and findings of the study, the following recommendations are forwarded that might mitigate the problem of poverty in the towns.

- The finding showed that 'year of schooling' is the uppermost contributor for multidimensional poverty both in Sebeya and Zalambesa towns. As a result, the Tigray Regional Education Bureau, in collaboration with Gulomekeda *Woreda* Administration Office and Education Office of the *woreda*, should create awareness through extension workers or during public meeting and motivate adults to continue education by opening primary and secondary level extension program to reduce the problem of lower year of schooling. Additionally, adult education programmes should be in place in the *woreda* in general and the study town in particular, in order to reduce the illiteracy rates and improve the human development in the towns.
- Illness' as one of the indicators of health both in Sebeya and Zalambessa towns has contributed a lot to multidimensional poverty next to year of schooling. Therefore, Gulomekeda Health Office, in collaboration with the *woreda* Administration office, should

work hard on disease prevention, alleviation and creating better awareness to get medicated when the people are sick.

- In addition, the scarcity of water supply has created sanitation problems that might have contributed to some health problems such as diarrhea. Accordingly, improving water supply is necessary by Gulomekada Water Resource and Mining Office in collaboration with the *woreda* Administration.
- The study also recommends interventions on energy use technologies, because in this study 'cooking fuel' was found as third contributors to multidimensional poverty of the poor. In turn, this may adversely affect to health status of the residents and contributes to environmental degradation. So local administration particularly the Water Resource and Mining Office in collaboration with the regional government should introduce clean energy such as solar energy or at least supplying improved oven coupled with an appropriate price is important to reach the poor and thus reducing poverty. Awareness creations on the importance of modern energy uses on health and environment should be done through the health extension workers of the towns.
- The study also recommended that to enhance the economic activities of the people, Trade and Industry Office of the *woreda* in collaboration with Tigray Regional Trade and Industry Beauro should arrange different economy motivator activities to the society by promoting investment such as small enterprise, small factories, agro-processing industries rather than providing food aid.
- The very big issue and relevant to the economic activities of the study area is creating peace with Eritrea. Actually, this agenda is beyond the scope of this thesis and it is a big concern of the two countries' government and people. However, when one looks at the weak economic activities and less livelihood system of the study towns, it may give energy to say either peace should be created or the dwellers should be resettled in some convenient place far from the boarder for improved and stable economic activities.

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APPENDIXES

Appendixes 1: Household Survey Questionnaires

Center for Food Security and development studies

Household Survey Questionnaires to be complete by sample households

Dear Sir/Madam,

My name is Tiblets Fetsum. I am MSc student at Addis Ababa University College of Development study Center for Food Security. Your household has been randomly selected to participate in the multidimensional poverty analysis survey which has been commissioned by Addis Ababa University. The aim of this survey is to collect information on multidimensional Poverty. The interview will take about half an hour. Your response will assist to achieve my research objectives.

I assure you that your answers will be completely confidential. Only summary information will be used for analysis and for academic purposes. No individual filled questionnaire will be made available to any group or authority.

I highly appreciate your assistance and I thank you for your cooperation in advance.

General direction

Please circle the appropriate answer for the questions from the given choices and fill in the black space for the open ended questions and for extra answers.

Part I. Identification Information

1. Town name _____
2. *Ketena* name _____
3. Household ID _____
4. Date of interview____/_____/_____
5. Enumerator's name _____ Signature _____

Part II. Household head data information

1. Age of household head _____
2. Sex - 1.Female 2. Male
3. Marital status
   1. Single 2. Married 3. Divorced 4. Widowed
4. Household head highest educational level.
   1. Not read and write
   2. Read and write
   3. Primary 1st cycle (1- 4 grade)
   4. Primary 2nd cycle (5-8 grade)
   5. Secondary (9-12 grade)
   6. Diploma
   7. First degree
   8. Above first degree
5. Status of employment of household head.
   1. Employed 2. Unemployed 3. Pensioner
6. If your answer for Q.5 is employed, what is your main occupation?
   1. Self-employed /Self-account
   2. Government employed
   3. NGO employee
   4. Other _____
7. If your answer for Q.6 is self- employed, which type of own-account/self-employed are you engaged in?
   1. Petty-trade/*Gulit*
   2. Preparing and sale of local drinks
   3. Sale of food
   4. Handicraft (embroidery, pottery)
   5. Metal /Woodwork
   6. Hotel service
   7. Others _____

Part III. Household data information

8. Household member's size (including yourself) _____
   Number of family members below age of 15 _____**;** M_____F_____
   Number of family members between 15 & 64_____**;** M_____F_____
   Number of family members above 64 _____**;** M_____F_____
9. How many the economically active (productive) individuals (15 – 65 years) are employed? _____. And how many of them are unemployed? _____.
10. Did you use credit within one year for business?
    1. Yes _____ Birr 2. No
11. Your monthly average income in Birr: _____.
12. Is there any household member addicted to alcohol or drug?
    1. Yes 2.No
13. On what basis does the household occupy the dwelling?
    1. Privately owned
    2. Rented from private
    3. Other _____

Part IV. Household health and education

Education

14. Is there any household member not completed four years of schooling?
    1. Yes 2. No
15. If yes for Q.14 what is the reason
    1. No access to school
    2. Lack of money for schooling
    3. Do not want/ no interest
    4. To help family
    5. Others _____
16. Is there any School age children (7-15 years) in your household member that are not attending school at this time?
    1. Yes 2. No
17. If your answer for Q.16 is yes, what is the reason for not attending?
    1. No access to school
    2. Lack of money for schooling
    3. Do not want/ no interest
    4. To help family
    5. Illness
    6. Others _____

Health

18. Is there any member in your household faced any health problem at least once during the last 2 months period or during survey? 1. Yes 2. No
19. If yes for Q.18 what was the sickness/ injury the one faced?
    1. Malaria 2. Diarrhea
    3. Injury 4. Dental
    5. Tuberculosis 6. Other _____
20. Do you or any other member of the household have any physical difficulties?
    1. Yes 2. No
21. If your answer to question number Q.20 is yes what type (more than one can be chosen)
    1. Seeing 2. Hearing
    3. Walking/climbing steps 4. Concentrating/remembering
    5. Unable to self-caring (washing, feeding, dressing, toileting)
    6. Other _____
22. For how many days were you or others absent from the usual activity due to the health problem during the last 2 month? Number of days_____
23. Is there any child (below five year) dead in the household in the past five years?
    1. Yes 2. No
24. If the answer is yes for Q.22 what was the cause for death?
    1. Diarrhea 2. Accident 3. Malaria
    4. Pneumonia 5. Others _____
25. What is the amount of expenditure of the household for health in the last 12 months?
    In Birr_____

Part V. Household living standard

Water

26. What is the main source of drinking water for your household?
    1. Private tap in the compound
    2. Communal tap outside
    3. Protected well /spring (private)
    4. Protected well /spring (shared) or rain water
    5. Unprotected well or spring
    6. River /lake/ pound
    7. Other_____
27. What is the single tripe distance from house to water source (in meters) if the source is out of compound? _____.

Improved sanitation;

28. What type of toilet facilities does the household use?
    1. Flush toilet or ventilated Pit latrine –private
    2. Flush toilet or ventilated Pit latrine –shared by households with in the house or compound.
    3. Communal (shared by small community) flush toilet or ventilated Pit latrine.
    4. Pit latrine private not ventilated
    5. Pit latrine shared- not ventilated
    6. Field /forest 7.Others _____

Electricity

29. What is the main source of light and powering for the household?
    1. Electricity meter- private 2. Electricity meter- shared with neighbor
    3. Solar energy 4. Bio -gas
    5. Local kerosene lamp (*Kuraz*). 6. Other _____

Room flooring

30. The floor of the main dwelling is predominantly made of what material?
    1. Mud/dung 2. Parquet or polished wood
    3. Cement screed 4. Plastic tiles
    5. Cement tiles 6. Ceramic/marble tiles 7. Others _____

Room density

31. How many rooms (excluding kitchen, toilet, bath room & rooms used for business) does the household occupy? Number of rooms _____
32. Do more than three people live in one room? 1. Yes 2. No

Cooking fuel

33. Which type of cooking fuel does your household frequently use for cooking purpose?
    1. Electricity 2. Wood/Leaves/ crop residue/Animal dung/ Charcoal/grass
    3. Butane gas 4. Others _____
34. Does the household's kitchen have chimney or ventilation such as open or open-able window?
    1. Yes 2, No
35. What is the primary type of oven (*Mitad*) used for baking injera/bread?
    1. Traditional *mitad* (removable)
    2. Traditional *mitad* (not removable)
    3. Improved energy saving *mitad* like *lakech*, *Mirt*
    4. Electric *mitad* 5. Other _____
36. What is the primary type of oven used for cooking *Wot*?
    1. Traditional *stove* (removable or 3 stone)
    2. Traditional stove (not removable)
    3. Improved energy saving *stove*

4. Electric *stove*
5. Other _____

37. If for Q.35 & 36 is traditional *mitad and oven/stove* why do not you use electric, energy saving or any other modern oven?
    1. No access
    2. Owning (purchasing) cost is high
    3. Running (electric power fee) cost is high
    4. Other_____

Assets ownership

38. How many of this item does your household own? If none record 0

No	Item Name	Number of items
1	Telephone	
2	Television	
4	Radio	
5	Refrigerator	
6	Animal cart	
7	Car	
8	Motorbike	
9	Bike	
10	Others_____	

Thank you very much!!!

Key Informant Structured Interview Guide

Dear respondent,

The main objective of this interview is to collect primary data to undertake an assessment on household multidimensional poverty status. Your responses to the questions are valuable and will be held in utmost confidentiality and the data is intended to be used only for the analysis of this research. You will not be identified by name in any case.

Thank you in advance for your cooperation.

1. In your opinion, how do you describe the status and trend of poverty in this *woreda* especially in the non-capital towns namely Zalambesa and Sebeya?
2. How is the status and trend of the access of public goods (services) such as education, shealth centers, electric power and water access in Zalambesa and Sebeya?
3. What do you think are the main determinant factors of poverty in this area particularly in Zalambesa and Sebeya?
4. In your opinion, do you believe that all households use improved toilet? Or is there any kind of open defecation in this area particularly in Zalambesa and Sebeya? If people are using open defecation, what do you think are the reasons for your response & what do you recommend for improved sanitation of the area?
5. Is there any household that travels more than 0.5km from his/her houses to the water sources to get water in Zalambesa and Sebeya? What do you think is the reason/s for your answer?
6. Is there any school age children (above seven year) that do not started or drop out from school? What do you think is the reason/s for your answer?
7. Do you believe the culture of use of electricity for cooking is improved? What do you think is the reason/s for your answer?
8. What is the major economic activity of Zalambesa and Sebeya towns?

Thank you very much!!!

Appendix 2: Partial view of tradition household kitchen


Appendix 3: Partial view of household toilets


Appendix 4: Partial view of food aid recipients


Source: own photo March 2018