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Multidimensional Measure of Poverty in Urban Ethiopia

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"This Thesis is my original work and has not been presented for a Degree programs in any other university."

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Abbreviations' and Acronyms

AF	Alkire Foster
CSA	Central Statistical Agency
EG	Economic Growth
GDP	Gross Domestic product
HH	Households
HDRO	Human Development Report Office
MDP	Multidimensional Poverty
MDGs	Millennium Developmental Goals
MPI	Multidimensional Poverty Index
MoFED	Ministry of Finance and Economic Development
NBE	National Bank of Ethiopia
OPHI	Oxford Poverty and Human Development Initiative
R & D	Research and Development
SDGs	Sustainable Development Goals
UNDP	United Nations Development Program
WB	World Bank

Abstract

This study analyzed multidimensional poverty in urban (small, medium and large towns) Ethiopia. As social well-being or poverty is a multidimensional phenomenon, using a multidimensional measure of poverty helps avoid problems surrounding the conventional measures of poverty and helps show clearly the realities of households. In this line, this study analysis used three dimensions with ten indicators to construct a multidimensional index of poverty using third rounds of Ethiopian Rural Households' Socioeconomic Survey data set. The study also employed a logit analysis for examining determinants of poverty. The results reveal that intensity, severity, and depth of urban Ethiopia multidimensional poverty are 71.4%, 46.1% and 32.9% respectively. The poorest of the poor are those residing in small town areas compared to medium and large towns even if the difference is low. Female household heads experience a greater breadth and severity of multiple deprivations relatively than male household heads. Moreover, demographic and household heads' characteristics are major factors in determining poverty. Targeting programs in living standard, health and education dimension will reduce poverty substantially. It can be achieved by enforcing policies and collaborate with foreign concerned organs.

Keywords: Multidimensional, Poverty, logit, Urban, Ethiopia

CHAPTER ONE

1. Introduction

1.1 Background of the study

Though there is numerous researches have been made in poverty, there are fewer people living in extreme poverty in the world today than 30 years ago. Inequalities in access to key resources threaten to stall growth and poverty reduction in many places. The World poorest have made only a small absolute gain over those 30 years. Progress has been slow against relative poverty as judged by the standards of the country and time one lives in, and a great many people in the world's emerging middle class remain vulnerable to falling back into poverty (Ravallion, 2017).

Based upon (Sen A, 1976) capability approach that sees poverty as the lack of multiple freedoms that individual value and have reason to value and the limitations of monetary approaches to measure poverty, nowadays well-being in general and poverty, in particular, are defined as the shortfall of individuals in a number of life dimensions, such as health, education and standard of living. This aggregate poverty index calculated from the deprivations in different life dimensions is called Multidimensional Poverty Index (MPI). Therefore, conducted to analysis multidimensional poverty measurements have significant importance (Alkire et al., 2013).

Nowadays poverty is the main concern in Sustainable Development Goals (SDGs). It is no longer a problem to the developing countries but also to the western nations as well. The SDGs aspires to eliminate poverty for all humanity. The success should be measured and judged by how it benefits the marginalized and excluded peoples at different corner of the world. Regardless of combating effort by many stakeholders, poverty is continuing as the main social problem for most of developing countries including Ethiopia (Belaineh & Kedir, 2017).

The Sustainable Development Goals recognize and seek to end poverty in all its forms and dimensions. Thus a multidimensional concept of poverty is now embedded in the SDGs.

Multidimensional approaches to measuring poverty and deprivations have become more common in recent years. For example, it may be that government policy should include the distribution of happiness among the population as one relevant tool for determining how society is progressing, and use it to shape some public policies (such as the protection and development of open spaces for recreation or the provision of support for child care to change time-use patterns for overly busy parents). It may also be the case that certain forms of unhappiness, such as depression and other relevant mental health disorders, should generate certain entitlements, such as to ant depression treatment. OPHI has developed modules for missing dimensions of development, has created the Multidimensional Poverty Index (MPI), now added to the United Nations Development Program's suite of composite indices of human development, and has helped many national governments develop multidimensional poverty measures (OPHI 2017).Poverty in Ethiopia remains a major concern, but the country has also seen great progress. Ethiopia has the second largest population of all African countries. One of Africa's oldest independent countries, Ethiopia has a rich culture and long history. However, it is currently considered one of Africa's poorest countries despite a rapid population boom in recent decades (Rau, 2015)

The issue of poverty and the socioeconomic conditions of the general population has remained a big challenge since human civilization. Poverty is still a persistent issue in Africa and is on the rise in some countries which in turn is further worsening the access of the poor to the economic opportunities through which they could build up their assets and enhance income in order to come out of the poverty cycle. Unlike the slow growing developing countries, the rapid growing countries like Malaysia, Singapore and Taiwan have made remarkable progress in the field of economics and have magically resolved the issue of inequality, gender disparity and financial exclusion on a wider scale. The incidence of poverty and hard core poor have alleviated at large but rapid growth, rural urban migration and urban expansion has posed new challenges of urban poverty on rapid growing economies. Regardless of combating effort by many stakeholders, poverty is continuing as the main social problem for most of developing countries including Ethiopia (Belaineh & Kedir, 2017).

Africa has the highest rate of urban population growth, largely because it has the highest rates of overall population growth. Asia still has the highest rate of urbanization, and in effect the highest net rate of rural–urban migration. In most parts of the world, both the rates of urban population growth and the rates of urbanization have been declining, but the absolute number of people added to the world's urban population each year has been increasing, primarily because of the growth of urban populations in Africa and Asia. Looking forward, urbanization and urban population growth are likely to continue to decline, with only Africa still experiencing higher absolute increases in urban population every year, at least for a few more decades. It is now widely recognized that the rapid growth of urban populations has led to a worsening in absolute and relative poverty in urban areas. Urban poverty has, until recently, been low on the agenda of development policy because of dominant perceptions of urban bias and the need to counter this with a focus on rural development policy (Goshu, 2015).

Most researches on poverty in Ethiopia are income poverty measure, but poverty is interpreted not only as lack of income, instead generally as deprivation in various life domains. These include Nutrition, Child Mortality, Years of Education, School Attendance, Cooking Fuel, Sanitation, Drinking Water, Electricity, Floor and Assets (OPHI 2017). Therefore, doing researches on multidimensional poverty in urban Ethiopia is specifically important due to living in the urban areas of Ethiopia imposes extra expenses upon the poor in different ways. A same basket of basic goods and services are relatively more expensive in urban areas. The rural poor enjoy some basic facilities such as access to drinking water, fuel for cooking, housing, social security. The urban poor spent a substantial amount of their scarce earnings to have access to these facilities. Moreover, the urban poor are more vulnerable to natural disasters and human diseases due to living in unsafe places, high pollution and environmental hazards (Belaineh & Kedir, 2017).

The researchers focus on urban multidimensional Approaches to poverty measurement in Ethiopia. The MPI measures deprivations in three dimensions, giving equal weight to health (two indicators), education (two indicators) and standard of living (six indicators). The MPI uses a dual cut-off method. Within each indicator, a household is classified as deprived or not depending on whether it exceeds the relevant threshold. A household is classified as poor or not overall depending on whether it is deprived in at least 1/3 of the weighted indicators.

Therefore, the purpose of this paper is to measured multidimensional poverty in urban (small, medium and large towns) Ethiopia. The major contribution of this study is the estimated of multidimensional poverty in Urban (small, and medium and large town) Ethiopia by using Oxford Poverty and Human Development Initiative dimensions and indicators in 2018. Besides, the study conducted determinants of multidimensional poverty by using logit model.

1.2 Statement of the problem

Even though poverty has been under study for a long period, there is no consensus about its measurement. Conventional approach defines poverty as scarcity of income or economic resources to meet minimum basic needs for living a decent life. It shows monetary values of materials necessary for meeting basic needs in terms of income or consumption though it is far from revealing the realities of households as a result poverty alleviation policies have focused on providing the poor with means to ends. Consequently this measure of poverty has been criticized as it fails to show comprehensively the channels through which poverty manifests itself and does not reveal the true picture of social ills, capabilities, functioning, and income distribution. But since (Sen, 1976) identifying two problems in measuring poverty; the first is identifying the poor (that is, identifying people whose incomes/expenditures are below the poverty line) and the second is aggregating the features of poor people into overall indicators. Numerous efforts have been made to measure multidimensional indices and related developments to solve these problems. Due to this in contemporary works it has been admitted that it is a multidimensional phenomenon and measurements that account for these attributes have got prominence in literature (Bersisa & Hashmati, 2016).

The issue of poverty is critical for developing countries where there is widespread, deep-rooted, and multifaceted poverty. As in many other countries, poverty in Ethiopia is traditionally measured by a monetary indicator due to this regardless of numerous of anti-poverty programs by successive Ethiopian government, poverty reductions still remain difficult task. But the true measure of poverty should go beyond the mere income or expenditure required to attain minimum basic needs to show deprivation and capabilities. So use of the multidimensional approach in measuring poverty has vital importance.

There have been little efforts made by previous studies to estimate the multidimensional urban poverty in Ethiopia. (Goshu, 2015) Using data from the Young Live survey tried to create a comprehensive picture of poverty and human well-being in Ethiopia. The paper focused more on social exclusion estimates than the ordinal MPI estimation and used very few life indicators. Hence, this paper is in response to the limited research works using a country specific panel MPI estimation for Ethiopia.

Therefore, to understand whether wellbeing of urban Ethiopians improved or not, deep investigations of all non-income welfare indicators are also demanding. As a result this study analyzed multidimensional poverty in urban (small, medium and large towns) Ethiopia in 2015/16 including its factors.

1.3 Research Question

The research questions of the thesis are the following;

1. What are the levels of severity, depth and intensity of multidimensional poverty in urban households?
2. What are the levels of severity, depth and intensity of multidimensional poverty in urban households with respect to gender and living area?
3. What are the factors that influence urban multidimensional poverty in Ethiopia?

1.4 Objectives of the study

1.4.1 General objective

The aim of this paper is to examine multidimensional poverty in urban Ethiopia.

1.4.2 Specific objectives

The specific objectives of the thesis are the following;

- To determine severity, depth and intensity of multidimensional poverty status of urban households.
- To determine severity, depth and intensity of multidimensional poverty status of urban households with respect to gender and living area.
- To identify factors that influence the urban multidimensional poverty status of households

1.5 Significance of the study

The results provide insights for the quest poverty status of urban households in Ethiopia. The study will also serve further studies in this area and provide with a better insight and tool for donors and fiscal policy makers through giving idea, figure and data in their aspiration effort towards achieving sustainable growth and development. In addition, this study will fill the existing knowledge gap by inculcating multidimensional poverty measurement in urban Ethiopia.

1.6 Scope of the study

This research was limited to multidimensional poverty in urban Ethiopia and determinants of urban Ethiopia multidimensional poverty. The study considers only secondary data and study area is urban Ethiopian. Ethiopia is the second most populous countries in Africa and twelfths most populous country in the world providing 1.41% of the world population as at 2018. The study area is urban area with the population of 20% of the total (107,534,882) (WB, 2017).

1.7 Limitation of the study

Since, data compilation at CSA or/and World Bank has two features, meaning they compose their data accordingly and hence there may be a data limitation in this study. Further, availability of required fund for the smooth flow of the study may limit the soundness of the study.

1.8 Organization of the paper

This study consists of five chapters. Chapter one presents introduction, statement of the problem, objective of the study, significance of the study and scope and limitations. Chapter two reviews the most significant theoretical and empirical studies. Chapter three presents methodology of the study. Then chapter four provides the result and discussion of multidimensional poverty indexes and econometric model outcomes and finally, chapter five gives conclusions and recommendations with policy implication and further research direction.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 Theoretical literature

Poverty in its most general sense is the lack of necessities. Basic food, shelter, medical care, and safety are generally thought necessary based on shared values of human dignity. However, what is a necessity to one person is not uniformly a necessity to others. Needs may be relative to what is possible and are based on social definition and past experience. The essence of poverty is inequality. In slightly different words, the basic meaning of poverty is relative deprivation. A social (relative) definition of poverty allows community flexibility in addressing pressing local concerns, while objective definitions allow tracking progress and comparing one area to another (Bradshaw, 2005).

This first theory of poverty is a large and multifaceted set of explanations that focus on the individual as responsible for their poverty situation. Typically, politically conservative theoreticians blame individuals in poverty for creating their own problems, and argue that with harder work and better choices the poor could have avoided (and now can remedy) their problems. Other variations of the individual theory of poverty ascribe poverty to lack of genetic qualities such as intelligence that are not so easily reversed (*IBID*).

2.1.1 Theories of poverty

Internationally, chronic urban poverty has been discussed from a variety of perspectives. Issues include the global rate of urbanization, the scale and measurement of urban poverty and its spatial and social dimensions. In order to understand events associated with entry into and exit from poverty, as well assign appropriate anti-poverty policies, it is important to understand the fundamental causes of poverty. Many attempts have been made to answer the question of why people are poor. However, the literature still lacks a comprehensive theory of how to measure poverty, which may be due to the fact that poverty is complex to model. As (Duncan, 1984) notes, a complete explanation of why people are poor would require many interrelated theories, covering family composition, earnings, asset accumulation, transfer

programs, and the macro economy, to name but a few. The construction of this theoretical framework also affects the specification of the empirical model. Having reviewed theoretical models coined to explain reasons for poverty, this study classified them into two groups: human capital theory and poverty caused by geographic disparities (Tassew & Adiam, 2013).

Human capital theory explains both individuals' decisions to invest in human capital (education and training) and the pattern of individuals' lifetime earnings, and their different levels of investment in education and training are explained in terms of their expected returns from the investment. Since investing in education and training involves both direct and indirect costs, only those individuals who believe they will be compensated by sufficiently higher lifetime earnings will choose to invest. Those who are less likely to invest in human capital are people who expect to spend less time in the labor market and those who have fewer labor market opportunities. As a result, this theory would help explain historical patterns of lower earnings and higher poverty rates among women and minorities, among others. The pattern of lifetime earnings can also be explained by human capital theory. In general, the patterns of individuals' earnings are such that they start out low (when young) and increase with age, although earnings tend to fall somewhat as individuals near retirement. Younger people are more likely to invest in human capital than older people because they have a longer remaining work life to benefit from their investment and their foregone wages are lower costs of investing are, hence, lower. Earnings then increase rapidly with age as new skills are acquired. Finally, as workers grow older, the pace of human capital investment and thus productivity slows, leading to slower earnings growth. At the end of a person's working life, skills may have depreciated as a result of lack of continuous human capital investment and the aging process. This depreciation contributes to the downturn in average earnings near retirement age. To the extent that poverty follows earnings, we might predict a similar relationship between age and poverty, with poverty more likely for the young and elderly. Earnings are only one of the determinants of poverty. Thus, human capital theory cannot be considered a complete theory of poverty. Poverty caused by geographical disparities. This explains why poverty is most intense in certain areas and why some regions lack the economic base to compete. This theory calls attention to the fact that people, institutions and cultures in certain areas lack the objective resources needed to generate well-being and income, and that they lack the power to claim redistribution. A number of reasons are given in the literature for why some regions are associated with poverty while others are noted for their prosperity. Remoteness, certain types of natural resource endowments, political

disadvantage, and weak integration can all contribute to the creation of intra-country spatial poverty traps. But spatial disadvantage includes much more than lagging regions within a country (Davis et al, 2015).

1 Classical and neoclassical

Classical traditions view individuals as largely responsible for their own destiny, choosing in effect to become poor (e.g. by forming lone-parent families). The concept of 'sub-cultures of poverty' implies that deficiencies may continue over time, owing for example to lack of appropriate role models, and that state aid should be limited to changing individual capabilities and attitudes (i.e. the laissez-faire tradition). Neoclassical theories are more wide ranging and recognize reasons for poverty beyond individuals' control. These include lack of social as well as private assets; market failures that exclude the poor from credit markets and cause certain adverse choices to be rational; barriers to education; immigrant status; poor health and advanced age; and barriers to employment for lone-parent families. Looking at the classical and neoclassical approaches together, their main advantages reside in the use of (quantifiable) monetary units to measure poverty and the readiness with which policy prescriptions can be put into practice. They also highlight the influence of incentives on individual behavior as well as the relationship between productivity and income. Criticism of these approaches highlights their overemphasis on the individual (without, for instance, taking into account links with the community) and the focus on purely material means to eradicate poverty (Maestre, 2015).

2 Keynesian/neoliberal

Even though the neoliberal school led by the new-Keynesians also adopts a money-centered, individual stance towards poverty, the importance assigned to the functions of the government allows for a greater focus on public goods and inequality. For instance, a more equal income distribution can facilitate the participation of disadvantaged groups of society in the type of activities that are deemed essential under broader notions of poverty. On the other hand, new-Keynesians are in line with neoclassical economists in their belief that overall growth in income is ultimately the most effective element in poverty removal. Publicly provided capital (including education) has an important role to play, with physical and human capital believed to be the foundation for economic prosperity. Unlike the classical approach,

unemployment, viewed as a major cause of poverty, is largely seen as involuntary and in need of government intervention to combat it. Excessive inflation, high sovereign debt and asset bubbles are other macroeconomic factors, besides weak aggregate demand, believed to cause poverty (Davis & Martinez, 2015).

3 Marxian/radical

By suggesting radical changes in the socio-economic system, Marxian economists and other radical theorists highlight the possibility that economic growth alone may be insufficient to lift poor people out of (relative) poverty, because those who belong to certain classes may not reap any of the benefits of overall income growth. Similarly, by emphasizing the concept of class, it provides a shift in perspective, focusing on group (rather than individual) characteristics, with individuals' status considered dependent on the socio-economic environment in which they live. Nevertheless, adequacy of income remains a key factor. Within a capitalist system, alleviation of poverty may require minimum wage laws, action to eliminate dual labor markets, and antidiscrimination laws (seen as one of the most effective anti-poverty strategies). The exploitation of the poor by the rich groups in society may also occur via the quality of the environment; for example, the poor tend to suffer most from air pollution (normally generated by the wealthier groups) given their residential location. A further contribution of Marxian/radical economists is the sense that poverty is a moral as well as a technical issue (Maestre, 2015).

4 Social exclusion and social capital

Another strand of the literature stresses the interrelation between social exclusion, social capital and the occurrence of poverty and recognizes the importance of the structural characteristics of society and the situation of certain groups. Social exclusion and social capital theories are, among all the reviewed approaches, arguably the ones that focus most on understanding the intrinsic processes that allow deprivation to arise and persist. Nevertheless, the wide definition of poverty considered under these theories comes at the cost of being less precisely defined and more challenging to quantify and address by policy (Davis & Martinez, 2015).

Among different poverty theories, the traditional welfare theory is the dominant neo-classical theory in poverty analysis. Traditional welfare theory still influences researchers, policies and measurement of wellbeing in the poverty arena. This theory relates poverty with lowness of earning income/wages and on choice based behavior as one of the primary cause of poverty. Individuals choose certain lifestyle that put them at much higher risk of poverty. The traditional welfare theory views poverty as the fault choice of the poor. In this perspective low income is clearly one of the major causes of poverty. It is assumed that the expenditure reflects the utility placed on the commodity purchased and consumed; then welfare can be measured as the total consumption enjoyed. Poverty is defined as the shortfall below some minimum level of resources. However, the contemporary debates on poverty acknowledge that poverty is multidimensional. In this regard capability and Social Exclusion theories are the most influential theories. The capability theory is the first of all that acknowledged poverty as multidimensional. Capability poverty theory, sometime called new social welfare theory, was developed in 1980's by (Sen A, 1976). Capability theory proposes the serious departure from concentrating on the means of living to the actual opportunity of living. In capability theory poverty is defined as the deprivation in the space of capabilities or faller to achieve certain minimal or basic capabilities. The most important and fundamental concept in this theory is the freedom that an individual can enjoy in the life he\she lives. (Anand and Sen1997) define poverty as lack of freedom. People are restricted when they face famine, under nutrition, and little access to health care, little access to clean water, unnecessary morbidity, and premature mortality, lack of basic education and other opportunities, inequality between men and women and the denial of political and civil right (Clarly et al., 2010).

On the other hand, the concept of social exclusion is relatively recently introduced in the discipline of social science. The use and the meaning of social exclusion vary across countries and socially rooted in different traditions. However, the fundamentals of social exclusion in literature is seen as multidimensional, relationally dynamic and its relativity. For many, definition of social exclusion generally means lack of participation in economic, social and political activities or opportunities. In this perspective, poverty is considered as a consequence of exclusion from economic, social, political or denial of opportunities and access to basic services (Belaineh & Kedir, 2017).

2.2 Empirical literature

According to the United Nations, the global urban population will grow from 3.3 billion people in 2008 to almost 5 billion by the year 2030. This urban expansion is not a phenomenon of wealthy countries. Almost all of the growth will occur in unplanned and underserved city slums in parts of the world that are least able to cope with added demands. The pace of urbanization far exceeds the rate at which basic infrastructure and services can be provided, and the consequences for the urban poor (Alison et al., 2017).

Global poverty has become an urban phenomenon. In the year 2002, 746 million people in urban areas were living on less than $2.00 a day. The absolute number of urban poor has increased in the last fifteen to twenty years at a rate faster than in rural areas. Rapid urban growth has made Asia home to the largest share of the world's slum dwellers. But nowhere is the threat of urbanizing poverty graver than in Africa, which has the fastest rate of urban growth and the highest incidence of slums in the world. In her contribution to this volume, Vanessa Watson writes that rapid urbanization in Africa has been decoupled from economic development. In the last fifteen years the number of slum dwellers has almost doubled in sub-Saharan Africa, where 72% of the urban population lives in slums (Ravallion, 2017).

A one-dimensional measurement and analysis of poverty is abundant in literature on poverty. Regardless of its limitations, it carries significant information for distributional comparisons; assessing public policies and evaluating impacts of interventions. There is well-documented evidence in literature on the effect of family size and its composition on the status of households. Household composition (gender and age of members) significantly affects expenditure per capita and the poverty level for the household. Using family size to compute per capita income/expenditure produces an inaccurate measure due to the effect of household composition on income/consumption and the economies of scale (cost saving advantage) of larger family sizes (Gebreslassie, 2013).

Not denying this fact poverty is multidimensional problem, the numerous studies are conducted on income poverty. The most commonly 'accepted' definition is related to an income based approach which states that poverty is the lack of income or financial resources to satisfy the individuals' basic needs and/or to achieve a minimum standard of living Besides

this, (Adem & Beshir , 2016) stated that a strategy in eradicating poverty among the urban households in business sector does not only aim at increasing the income level, but also increasing overall number of entrepreneurs in a country. Robinson also revealed that urban poor households must be aided not only in terms of business capital, but also in terms of motivational and skill oriented training that inculcates entrepreneurship values to be utilized in commencing socio-economic developments that illustrates the importance of entrepreneurship oriented human development (Adem & Beshir , 2016).

For the determinant of multidimensional poverty socioeconomic characteristics of households and respondents surveyed, including age, sex, place of residence, religion, and household characteristics. Households in Ethiopia are predominantly male headed, a common feature of most African countries. Rural households have 4.9 persons per household and are slightly larger than urban households (4.2 persons).Ethiopia has a pyramidal age structure due to the large number of children less than 15 years of age. Children under 15 years of age account for 46 percent of the population, a feature of populations with high fertility levels. Fifty-one percent of the population is in the age group 15-64 and almost 4 percent are over 65 (CSA, 2016). The information is also useful in understanding and identifying the major factors that determine or influence the basic demographic indicators of the population which intern determine urban multidimensional poverty (Belaineh & Kedir, 2017).

As in many other countries, poverty in Ethiopia is traditionally measured by a monetary indicator. (Alkire and Robles 2015) Using data from Living Standard Surveys, monetary values of consumption expenditures on multiple aspects of life, including food, education, housing, and assets, were calculated for surveyed households and compared against poverty lines below which individuals are deemed poor. Poverty is interpreted not only as lack of income, but more generally as deprivation in various life domains. These include Nutrition, Child Mortality, Years of Education, School Attendance, Cooking Fuel, Sanitation, Drinking Water, Electricity, Floor and Assets (OPHI, 2017).

(Gebremedhin, 2006) Examines poverty in urban Ethiopia using household survey data for 1994 and2000 by capturing non-monetary indicators, such as, subjective welfare status, nutritional status of children and housing characteristics are also examined. Consumption poverty is found to be high, with an overall head count of 47 percent, in 1994, and 40 per

cent, in 2000. In his findings indicated that there was significant association between consumption poverty and subjective welfare status, but a weak agreement in ranking of households. Non poor households, in terms of consumption, are found to enjoy better housing amenities. However, the association between consumption poverty and child nutritional status is not strong. Poverty dynamics also analyzed using transition matrices and multivariate regression techniques. It was found that over 58 per cent of panel households had experienced poverty at least once during the period. Of these, over half had been chronically poor. The poverty transition was also quite significant with over a quarter of households experiencing a change in their poverty status. The results also showed that households with higher dependency ratio and whose heads are self-employed, casual workers, pensioners and unemployed have a lower probability of exiting poverty. Those that are educated and belong to major ethnic groups have a higher probability of exit. Similar factors are significant in affecting the probability of entry (Gebremedhin, 2006).

(Alison et al., 2017) Analyzed multidimensional poverty in Ethiopia; focusing on selected dimensions of education, health, culture and living standards. It used nationally representative data from the Household Consumption and Expenditure and Welfare Monitoring surveys implemented in 2000, 2005 and 2011. Single and multiple deprivation analyses were conducted on 11 multidimensional poverty indicators. The single deprivation analysis investigated levels and trends taking one indicator at a time. The single deprivation analysis reveals that rural areas have seen large reductions in different dimensions of poverty, but the extent of deprivation incidence is still higher in rural areas. In their findings the movements of most of the indicators over the 2000-2011 periods showed considerable improvement in education, health and living standards dimensions. This confirms the positive story of monetary poverty reduction and considerable GDP growth presented in other analyses and official statistics (Alemayehu et al., 2015).

(Goshu, 2015) Estimated Ethiopia's MPI with the counting approach showed that the percentage of multidimensional poor people for the years 2004 and 2009 were 35% and 25% respectively. The paper decomposed MPI across regions, household sizes, and depth and breadth of poverty. The MPI decomposition across time estimate confirmed that the large decrease in the MPI was the result of a significant decrease in the number of poor households

among the middle and the large families than a decrease in the number of deprivations. The panel MPI decomposition also showed that, once a household slips into poverty, the probability of exiting from it is very low. Child mortality contributed more for the decrease in the breadth of poverty. Moreover, the decrease in asset deprivation contributed the largest for the decrease in MPI across the two periods. The use of country-specific indicators such as land holding and crop stored for agrarian economy are more likely to identify poor people than indicators used in internationally comparable MPI estimation. This panel based MPI estimation clearly showed the progress or regresses of the household in achieving a particular indicator over time (Goshu, 2015).

Looking at water and sanitation, most researchers emphasize the importance of local organization within deprived neighborhoods to engage collectively with public authorities and utilities. Successful measures led by residents and their organizations have combined self-help with constructive engagement (Alison et al., 2017).

(Jean et al., 2016) analysis found difference in poverty according to age. Adults aged 25–34 years showed greater level of deprivation in education compared to the younger adults. Access to school was better for young children compared to teenagers and young adults in Afghanistan but also in Darfur, another conflict context. To date, the effort put towards universal education has focused on primary school enrolment. There result suggests that vocational training, literacy courses for adults as well as secondary and higher education, have been overlooked. Younger adults were profoundly deprived in employment, which is of great concern as the younger generation was often targeted to join the insurgency. Better possibilities of employment should be made available in the mining sector in the near future and, as there results suggest, young adults should be prioritized for these employment opportunities. Interventions to improve living conditions should focus particularly on older adults as they show the greatest level of deprivation. Lastly, adults aged 45 years and over showed the greatest deprivation in social participation (6%) and subjective wellbeing. Evidence of horizontal inequalities between urban and rural populations, Hazara and Uzbek and dominant ethnic groups and socially excluded people disabled at birth, reflects a lack of participation and suggests that these groups are not reached by existing poverty alleviation policy. Inadequate progress in improving these vulnerable groups' livelihoods reflects in part the result of a lack of consideration and understanding of a complex and unequal social and political environment, as suggested by several authors who argue that the existing patronage

networks undermine the effectiveness of economic interventions and maintain the poorest group in a state of material deprivation and disempowerment (Francois et al.,, 2016).

Multidimensional Measurements of Poverty Analysis in Urban Areas of Afar Regional State indicate more than 83.4 percent of the population in the study area was deprived in two or more of the seven deprivations, and on average they are deprived in 4.65dimensions, so that the adjusted Headcount Ratio was is 0.417.The percentage of people deprived in three or more of the seven dimensions was 76.3 percent, with M0 being 0.395 and people being deprived on average in 4.93 dimensions. Similarly, in four or more of the seven dimensions, 63.2percent of the population was multidimensionality poor with M0being 0.354 and the average intensity of deprivation being5.34 dimensions. The multidimensional poverty level continues to decline with a rise in the k-values. Only 2.5percent of the people are deprived in 6 dimensions and 0.2 percent household was deprived in total of the seven dimensions (Gebreslassie, 2013).

According to the (UNDP, 2018)Ethiopia Report over the past fifteen years, the headcount poverty rate declined by about 93 percent from 45.5 percent in 2000 to 23.5 percent in 2016, Household Consumption Expenditure Survey report, between 2010/11 and 2015/16 about 5.3 million people are lifted out of poverty. Poverty gap and poverty severity indices have respectively declined from 10.1 percent and 3.9 percent in 2000 to 3.7 percent and 1.4 percent in 2016. Nonetheless poverty is still a challenge in Ethiopia as over 22 million people are living below the national poverty line. Urban headcount poverty declined from 36.9 percent in 2000 to 14.8 percent in 2016 rural poverty only declined from 45.4 percent to 25.6 percent in the same period (*IBID*).

Monetary poverty is only one among several measures of deprivation. Decent living conditions, access to basic services, a minimum level of educational attainment and adequate safety nets are equally important measures of human well-being. Over-reliance on the monetary dimension of poverty may risk under-estimating the true extent of poverty in the urban context, where living conditions can be made harsher by diseconomies of agglomeration, such as congestion, environmental degradation and crime, theft and disorder. On the contrary, a good understanding of the non-monetary dimensions of poverty can provide policy-makers with more entry points for anti-poverty interventions. Monetary

poverty can for example be addressed by tackling non-monetary aspects of poverty, such as improvements in housing quality and better access to basic services (Muzzini, 2008).

By using dull cutoff multidimensional poverty approach in (Gebreslassie, 2013) Multidimensional Measurements of Poverty Analysis in Urban Areas of Afar Regional State about 63.2 percent of the total household are deprived in four or more dimensions. On the other hand the one-dimensional income poverty analysis revealed 33.9 percent of the household were poor. The estimated multidimensional poverty level was much higher than income poverty (Gebreslassie, 2013) and (Bersisa & Hashmati, 2016) found the probability of households living in rural parts being poor is about 0.27 higher than for those living in small towns. Households with larger family sizes are more likely to be poor. Age of household head nonlinearly affects the probability of being poor but it was not significant. Regional variations in poverty can be inferred from the coefficient of regional dummies. Beside, community characteristics like access to roads and a marketplace decrease the probability of falling into poverty.

Thus the above amalgamation of the theoretical and empirical poverty theory shows poverty can be majored in deferent ways and it is still a major issue in the globe generally in developing country like Ethiopia particularly. In the recent time MPI is the most significant measures to show poverty status of a country since it measures acute poverty: the proportion of people who experience multiple deprivations and the intensity of such deprivations. Hence, this paper uses the integrated theoretical approach to assess multidimensional poverty in urban areas of Ethiopia. The multidimensionality perspective that is used here integrates traditional welfare theory, capability and social exclusion theories as underpinning theoretical perspectives.

2.3. Measurements of poverty

Poverty measures compare people in a society in order to assess the extent of unacceptable disadvantages that exist. Yet any poverty measure is itself imperfect. Imperfections stem primarily from two factors: data limitations and the diversity of human lives being assessed. Internationally comparable measures face a greater challenge on both counts: the pool of comparable data is narrower, and the diversity of lives and contexts being compared is greater (Jahan & Alkire, 2018). A one-dimensional measurement and analysis of poverty is

abundant in literature on poverty. Regardless of its limitations, it carries significant information for distributional comparisons; assessing public policies and evaluating impacts of interventions (Bersisa & Hashmati, 2016). To make sound comparisons and to examine deprived indicator are significant or not this study need explored the extent of poverty small, and medium and large towns in Ethiopia using one-dimensional measures it can be analyzed by logistic regression poor by total per capita expenditure.

The multidimensional measurement of poverty has been conceptualized as following two main steps: identification and aggregation. In the one-dimensional space, the identification step is relatively an easy one. Even when it is recognized that the concept of a poverty line-as a threshold that dichotomizes the population into the poor and the non-poor- is somehow artificial, it is agreed to be necessary. Greater consideration is given to the properties that should be satisfied by the poverty index that will aggregate individuals' data into an overall indicator. However, in the multidimensional context, the identification step is more complex. Given a set of dimensions, each of which has an associated deprivation cutoff or poverty line, it is possible to identify for each person whether he/she is deprived or not in each dimension. However, the difficult task is to decide who is to be considered multidimensionality poor. One proposed approach has been to aggregate achievements in each dimension into a single cardinal index of well-being and set a deprivation cutoff value for the well-being measure rather than for each specific dimension to identify the multidimensionality poor. This approach has some practical drawbacks, in particular, in that it is based on number of restrictive assumptions, such as the existence of prices for all dimensions. Moreover, it does not agree with the conceptual framework of the capability approach which considers each dimension to be intrinsically important. Then, each dimension with its corresponding deprivation cutoff value needs to be considered at the identification step of the multidimensionality poor (Santos & Ura, 2014).

In this perspective, two extreme approaches have been traditionally used. On the one hand, there is the intersection approach, which requires the person to be poor in every dimension under consideration so as to be identified as multidimensionality poor. Clearly, this is a demanding identification criterion, by which the set of the poor is reduced as the number of dimensions considered increases, and may exclude people that are indeed deprived in several important dimensions. On the other hand there is the union approach, which requires the person to be poor in at least one of the considered dimensions. Clearly, with this criterion, the

set of poor increases as the number of dimensions does, and it may include people that many would not considered to be multidimensionality poor (Alkire et al., 2013).

In terms of the unit of analysis, ideally the MPI would have used the person as the unit of analysis, in order to analyze intra-household inequalities and decompose poverty by gender and age. However, health and, sometimes, educational indicators are not available for all household members. Thus, the MPI uses any available information on all members of each household in order to identify all household members as poor or not. Using overall household achievements to identify each person as poor, despite its limitations, allows for interaction, smoothing and mutual sharing within the household, and can create policy efficiencies *(IBID).*

In 2010 the MPI was introduced into the HDRs. As the 2011 HDR explained, "The MPI measures serious deficits in health, education and living standards, looking at both the number of deprived people and the intensity of their deprivations". A lead story of the 2010 launch (that there are more poor people in the eight poorest states of India than in the 26 poorest countries of Sub-Saharan Africa) carried internationally. The original MPI, similar to Sumner et al., independently found that 72 percent of the MPI poor lived in middle-income countries. It drew attention, in the 2011 HDR, to the environmental pressures from poor water and sanitation. And by 2014, a study covering 2.5 billion people over time found many instances of statistically significant and strong reduction in MPI, the fastest of which were in Nepal and Rwanda (Alkire & Foster, 2011).

The MPI carried the level, incidence (H) and intensity (A) of MPI; results of two alternative poverty cutoffs: Vulnerability (20 percent) and Severity (50 percent); and the contribution of each of the three dimensions to the MPI. The data tables on MPI published by OPHI included the above information plus all indicator-level detail using three poverty cutoffs, as well as disaggregation (rural-urban, sub national and age), strictly harmonized MPI data over time, all MPIs ever published and technical information (e.g. standard errors and sample sizes). Methodological reports itemized the treatment of each dataset. The 2014 and 2015 HDRs both contained MPIs obtained by the original and innovative methodology. The MPI-I modified five indicators: nutrition, child mortality, years of schooling and assets; it also treated households without children and women of child-bearing age (15-49) differently. In

particular, height-for-age (stunting) replaced weight-for-age (under nutrition) for children under five years of age, as stunting was becoming the favored indicator of child nutrition. A child death was included as a health deprivation only if it happened in the five years prior to the survey (when this information was included) or if the mother was under 35 years of age, if the date of death was not available. In education, a household was considered deprived if no one had completed six rather than five years of schooling. Six years reflected the standard definition of primary schooling and was used in international measures of functional literacy.

The MPI used an expanded list of assets including access to arable land (rented or owned), livestock, animal cart or motor boat to better reflect rural as well as urban assets deprivation. Households for which indicators on health are not available (in many surveys because they were without children and women of child-bearing age (15-49) were dropped from the MPI-I estimation and the sampling weights of its members were added to sampling weights of members in other households with the same characteristics regarding sex, age, and place (urban/rural).Both indices were published in parallel. Empirically, the results matched closely, but it was a useful exercise to explore different specifications. However publishing two MPIs created confusions in the development community. The present revision of the global MPI builds on and subsumes the best of preceding MPIs, as well as the knowledge and understanding that emerged from the dialogue between them. It also sketches issues such as missing data and the data limitations when analyzing poverty among older persons, as well as articulates some research questions (Jahan & Alkire, 2018).

The most common way of measuring poverty is to calculate the percentage of the population who are poor, known as the headcount ratio (*H*). Having identified who is poor, the AF method generates a unique class of poverty measures (M_α) that goes beyond the simple headcount ratio. Three measures in this class are of high importance: Adjusted headcount ratio (M_0), otherwise known as the MPI: This measure reflects both the *incidence* of poverty (the percentage of the population who are poor) and the *intensity* of poverty (the percentage of deprivations suffered by each person or household on average). M_0 is calculated by multiplying the incidence (H) by the intensity (A). $M_0 = H \times A$. *Adjusted Poverty Gap (M_1):* This measure reflects the incidence, intensity and depth of poverty. The depth of poverty is the average 'gap' (*G*) between the level of deprivation poor people experience and the poverty cut-off line. $M_1 = H \times A \times G$. *Adjusted Squared Poverty Gap (M_2)*: This measure

reflects the incidence, intensity, and depth of poverty, as well as inequality among the poor (captured by the squared gap, *S*). $M_2 = H$ x A x S. M_0 can be calculated with ordinal as well as cardinal data, which is why it is most often used. Cardinal data are required to calculate M_1 and M_2. The AF Method is unique in that by measuring intensity it can distinguish between, for example, a group of poor people who suffer two deprivations on average and a group of poor people who suffer five deprivations on average at the same time (Jahan & Alkire, 2018).

The MPI is a measure of acute global poverty developed by the Oxford Poverty and Human Development Initiative (OPHI) with the United Nations Development Program's Human Development Report (Alkire & Foster, 2014) In particular; it is an application of the adjusted headcount ratio, $M0$. This methodology requires determining the unit of analysis (i.e. household), identifying the set of indicators in which they are deprived at the same time and summarizing their poverty profile in a weighted deprivation score. They are identified as multidimensionality poor if their deprivation score exceeds a cross-dimensional poverty cutoff. The proportion of poor people and their average deprivation score (i.e. the 'intensity' of poverty or percentage of simultaneous deprivations they experience) become part of the final poverty measure (Alkire & Robles, 2015).

The MPI reflects both the incidence or headcount ratio (H) of poverty – the proportion of the population that is multidimensionality poor – and the average intensity (A) of their poverty – the 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 ($H \times A$). A person is identified as poor if he or she is deprived in at least one third of the weighted indicators. Those identified as 'Vulnerable to Poverty' are deprived in 20% – 33.33% of weighted indicators and those identified as in 'Severe Poverty' are deprived in 50% or more of the dimensions (Alkire & Santos, 2014).

The MPI to consider the 'depth' of deprivations rigorously although data may be ordinal, this study estimate a linked poverty measure which we call destitution. The destitution measure has precisely the same dimensions, indicators, weights, and poverty cutoff as the MPI. Only one set of parameters changes: the deprivation cutoffs. The cutoffs for 8 of the 10 indicators reflect more extreme deprivations. As a result, the destitution measure identifies a strict

subset of the MPI poor who are also deprived in at least one-third of the indicators according to the destitution cutoffs (Alkire & Robles, 2015).

The global MPI 2018 uses the same functional form as in previous years (the adjusted headcount ratio) (Alkire & Foster, 2014), which is the percentage of people who are multidimensionality poor adjusted by the average share of deprivations among the poor (intensity). Five of the 10 indicators are modified from the original MPI: nutrition, child mortality, and years of schooling, housing and asset ownership. The MPI uses information from 10 indicators that are categorized in three dimensions: health, education and living standards, and which identify each person as deprived depending upon the joint achievements of household members. The global MPI uses the cross-dimensional poverty cutoff of one-third, identifying each person as poor if their weighted deprivations sum to one-third or more. Two other poverty cutoffs are also used: severe poverty (the percentage of people deprived in at least half of the weighted indicators) and vulnerability (the proportion of people deprived in 20 to 33 percent of weighted indicators) (Jahan & Alkire, 2018).

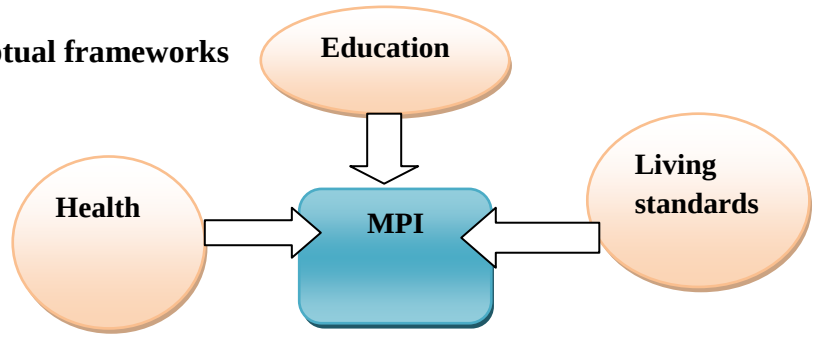
2.3 Conceptual Framework

Individuals' welfare depends not only on monetary income, but also on their access to certain social services, such as education and health care. Furthermore, when they own their homes, individuals benefit from the services their residences provide. Consequently, imputing the same level of welfare to two individuals with the same income, one of whom owns his own home while the other rents, has the net effect of underestimating the welfare level of the homeowner. These benefits vary by marital status, age, sex, size, region and living area. The value of the benefits imputed to households is thus estimated as a function of healthcare, education and living standards expenditures by marital status, age, sex, size, region and living area for each group in the population. Fighting extreme poverty on a multidimensional base like improving Wealth, education, Sanitation, Source of watering condition, Sources of energy for cooking and housing condition are among the main Millennium Development Goals (MDGs) agreed by 189 heads of state in 2000. Hence, to identify and analysis the extent and factors of urban multidimensional poverty, the conceptual model is drawn based on the literatures reviewed. This study analyzed multidimensional poverty indexes by using three dimensions; health, education and living standard. Education and health has two indicators and living standard has six indicators (Alkire & Foster, 2014). To analyzed factors

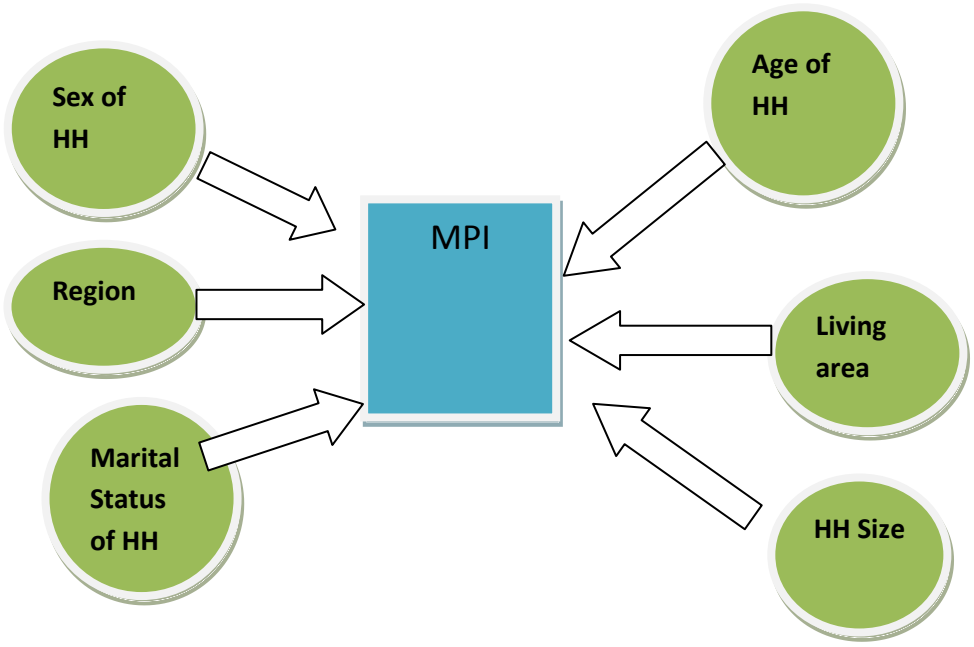
of multidimensional poverty this study uses different factors these are age of the household, sex of the household, marital status of the household, family size of the household (Gebreslassie, 2013), region and area of residence (Cacmakyapan & Goktas, 2013; Gebreslassie, 2013; Bersisa & Hashmati, 2016; Belaineh & Kedir, 2017).

The following diagram shows how multidimensional poverty indexes analyzed by using three dimensions; health, education and living standard.

Figure; 2.1 **Conceptual frameworks**



The following diagram also shows how factors of multidimensional poverty analyzed.



Source: extracted by the researcher (2018)

CHAPTER THREE

3. Methodology of the Study

3.1 Data type and sources

The data source for this study is secondary data obtained from CSA-World Bank-Ethiopian rural Socioeconomic Survey (ERSS-2015/16), which is nationally representative of small, and medium and large towns in the country. The data was generated with a collaborative project between the Central Statistical Agency (CSA) of Ethiopia and the World Bank Living Standards Measurements study. The data was meant to meet Ethiopian data demands and gaps targeting high quality and public accessibility while being aligned with the national strategy for developing statistics. The purpose of the project was to build capacity, share knowledge across countries, and improve survey methodologies and technologies. It covered all regional states except capital Addis Ababa. Its primary focus was rural parts and small towns. The data was collected from 402 small town and 1034 medium and large town enumeration areas (EAs). The 2015–16 survey was the third round of a long-term project to collect panel data on small, and medium and large town households, their characteristics, welfare and agricultural activities. The survey instrument was a questionnaire designed for collecting data at different levels: household, community, and agricultural. The primary sampling unit of the survey was households for the household questionnaire and it was drawn from a population frame that included small, and medium and large town areas in Ethiopia. For details of sampling procedure, sampling frame, sample size determination, and data quality refer to Ethiopia Socioeconomic Survey (ESS)Wave Three (2015/2016)

3.2 Method of Data Analysis

In this study both Alkire and Foster MPI and logistics regression were used. The study uses the Alkire and Foster MPI to examine multidimensional urban poverty status in Ethiopia. And also this study use logistic regression to identify factors that influence the urban multidimensional poverty status of households.

3.3 Model Specification

3.3.1 Model of poverty Analysis

3.3.1.1 Alkire Foster Methodology

In order to create a measure of multidimensional poverty, the paper used dual-cutoff approach created by (Alkire & Foster, 2014). The first cutoff is whether a person is deprived in a particular dimension. The second cutoff is the number of dimensions a person must be deprived in order to be considered poor. The Global MPI has three dimensions and 10 indicators. Each dimension is equally weighted, each indicator within a dimension is also equally weighted, and these weights. A person is identified as multidimensionality poor (or 'MPI poor') if they are deprived in at least one third of the weighted indicators shown above; in other words, the cutoff for poverty (k) is 33.33%.

The proportion of the population that is multidimensionality poor is the incidence of poverty, or headcount ratio (H). The average proportion of indicators in which poor people are deprived is described as the intensity of their poverty (A). The 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, it reflects both the share of people in poverty and the degree to which they are deprived.

If a person is deprived in 33.3% of the weighted indicators they are considered 'Vulnerable to Poverty', and if they are deprived in 50% or more (i.e. k=50%), they are identified as being in 'Severe Poverty'.

The base information in multidimensional poverty measurement is represented by a$n \times d$ dimensional achievement matrix X, where xij is the achievement of person i in dimension j. For each dimension j, a deprivation cutoff (zj) required in order to be non-deprived in indicator. The study obtain a deprivation matrix $g0$ such that: Based on this each person's achievement in each dimension xij , if the ith person's achievement level in a given dimension j falls short of the respective deprivation cutoff zj , the person is considered deprived in that dimension then the person is assigned a deprivation status value of 1, and 0

otherwise. It is noticeable that the deprivation in each of the d dimensions may not have the same relative importance. Thus, a vector $w = (w1,)$ of weights is used to indicate the relative importance of a deprivation in each dimension. The deprivation score of each person is determined. In addition to, the AF methodology uses a poverty cutoff (k) to determine the multidimensional poorness. The poverty cutoff is the minimum deprivation score a person needs to exhibit in order to be considered as multidimensional poorness. If the person is poor, the identification function will take on a value of 1; if the person is not poor, the identification function will have a value of 0.

The adjusted headcount ratio can also be written as the product of the incidence (H) and intensity (A) of poverty. Multidimensional headcount ratio or H is the percentage of the population that is poorness. Overall poverty is a population-share weighted sum of subgroup poverty levels. With this property this study analyzes poverty by regions, by ethnic groups, and by other subgroups. The population share is denoted by for urban areas and for rural areas.

The multidimensional poverty measure can also be written as a weighted sum of the dimensional deprivations. This property is useful to analyze the composition of multidimensional poverty. Based on equation, the censored headcount ratio of a dimension defined as the percentage of the population who are both multidimensional poor and also deprived in that dimension. Furthermore, this study considers the percentage contribution of each dimension to overall poverty which can be given by: if the contribution to poverty of an indicator is more than its weight, there is a relatively high censored headcount in this indicator. The poor are more deprived in this indicator. The censored headcount ratios and the percentage contributions are important for understanding the composition of poverty in different regions. In order to determine the number of multidimensional poor in given area it is need to multiply the M0 or H calculated from the sample survey by the population of the area. The number of multidimensional poor can be expressed as: Number of multidimensional poor=H * total population.

3.3.2 Description of Dimensions, Variables and cutoff point

In 2018, the United Nations Development Program's Human Development Report Office (HDRO) and the Oxford Poverty and Human Development Initiative (OPHI) agreed to adjust and unify their methodologies on poverty measurement and consider indicator improvements, in order to better monitor the Sustainable Development Goals (SDGs).Joint global Multidimensional Poverty Index first published in 2018, which is an international comparable measure of acute poverty that captures the multiple deprivations poor people experience with respect to health, education and living standards. It builds on the original MPI launched in 2010, and an innovative MPI launched in 2014. The best features of both of these are subsumed in the joint global MPI 2018, which also reflects new data possibilities to better align the global MPI to the Sustainable Development Goals (Jahan & Alkire, 2018).

Therefore, in this paper used three dimensions to measure multidimensional poverty: health, standard of living, and education. The selections of these dimensions are based on the Sustainable Development Goals (SDGs), Growth and Transformation Plan of Ethiopia (GTP) and other poverty reduction strategies. It appears that the choice of indicators for each dimension in some cases has led by experience and availability of data. A summary of the dimensions, indicators, thresholds and weights used in the MPI explained below.

Education

The MPI uses two indicators that complement each other within the education dimension: one looks at completed years of schooling of household members, the other at whether children are attending school. Years of schooling acts as a proxy for the level of knowledge and understanding of household members. In terms of deprivation cut-offs for this dimension, the MPI requires that at least one person in the household has completed **five years** of schooling and that all children of school age are attending grades 1 to 8 of school.

It is important to note that because of the nature of the MPI indicators, someone living in a household where there is at least one member with five years of schooling is considered non-deprived, even though she/he may not be educated. Analogously, someone living in a household where there is at least one child not attending school is considered deprived in this indicator, even though she/he may have completed schooling. People living in households with no school-aged children are considered non-deprived in school attendance. Hence the

incidence of deprivation in this indicator will reflect the demographic structure of the household and country, as well as the educational attainments.

However, due to data availability this paper used two indicators of education for deprived if any school age that have not read or write in any language in the household and no one is completed more than six grades in the household.

Health

Comparable indicators of health for all household members are generally missing from household surveys, making this dimension the most difficult to measure. The MPI uses two health indicators that, although related, depart significantly from standard health indicators. The first indicator looks at nutrition of household members. For children, malnutrition can have life-long effects in terms of cognitive and physical development. Adults or children who are malnourished are also susceptible to other health disorders; they are less able to learn and to concentrate and may not perform as well at work. Multiple Indicator Cluster Surveys (MICS) provide nutritional information on children, and World Health Survey (WHS) data provides nutritional information on adult household members (men or women). The nutritional indicator used for children relates to being under-weight (also called weight-for-age), which is used to track the SDGs. A child is under-weight if she/he is two or more standard deviations below the median of the reference population. The nutritional indicator used for adults meanwhile is the Body Mass Index (BMI). An adult is considered to be undernourished if he or she/he has a BMI lower than 18.5.

The MPI identifies a person as deprived in nutrition if anyone in their household (for whomever there is information on children, women or other adults) is malnourished. Therefore, it is fundamental to note that deprivation rates by indicator depart from the standard nutritional statistics, and depend upon the survey used and the demographic structure of the household. The second indicator uses data on child mortality. Most, although not all, child deaths are preventable, being caused by infectious disease or diarrhea. Child malnutrition also contributes to child death. In the MPI each household member is considered to be deprived if there has been at least one observed child death (of any age) in the household. It is important to observe that this indicator differs from the standard mortality statistics.

However, due to data availability this study used two indicators of health these are deprived in heath due to health problem for 4 week and deprived in heath due to haven't consulted medical assistance for 12 month.

Living standards

The MPI considers six indicators for standards of living. In these indicator SDG indicators almost similar to MDG indicators therefore this study includes ten MDGs indicators that are related to health and living standards, and which particularly affect women: access to clean drinking water, access to improved sanitation, and the use of clean cooking fuel. The justification for these indicators is adequately presented in the MDG literature. It also includes two non-MDG indicators: access to electricity and flooring material. Both of these provide some rudimentary indication of the quality of housing for the household. The final indicator covers the ownership of some consumer goods, each of which has a literature surrounding them: radio, television, telephone, bicycle, motorbike, car, truck and refrigerator. The selected deprivation cut-offs for each indicator (except for the one relating to assets) are backed by international consensus as they follow the MDG indicators as closely as data permit.

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 30 minutes' walk (round-trip). If it fails to satisfy these conditions, then the household is considered deprived in access to water.

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. If the household does not satisfy these conditions, then it is considered deprived in sanitation.

Electricity: A household is considered to be deprived in electricity if it does not have access.

Flooring: Flooring material made of dirt, sand or dung counts as deprivation in flooring.

Cooking fuel: A household is considered deprived in cooking fuel if the household cooks with dung, charcoal or wood.

Assets: If a household does not own more than one radio, TV, telephone, bike, motorbike or refrigerator, and does not own a car or tractor then each person in it is considered deprived.

The following table shows those indicators with the associated cutoffs used to identify deprived urban Ethiopia households.

Table 3.1: Multidimensional Poverty Index (MPI): Dimensions, Indicators, and Deprivation Cutoffs

Dimension	Indicator	Deprived if…	Relative Weight
Education	Years of Schooling	no one is completed more than six grade in the household	1/6
	Child School Attendance	any school age that have not read or write in any language in the household	1/6
Health	Health problem	health problem for 4 week	1/6
	Health Consult	Haven't consulted medical assistance for 12 month.	1/6
Living Standard	Electricity	The household has no electricity.	1/18
	Improved Sanitation	The household's sanitation facility is not improved (according to MDG guidelines), or it is improved but shared with other households.	1/18
	Safe Drinking Water	The household does not have access to safe drinking water (according to MDG guidelines) or safe drinking water is more than a 30-minute walk from home, round trip.	1/18
	Flooring	The household has a dirt, sand or dung floor.	1/18
	Cooking Fuel	The household cooks with dung, wood or charcoal.	1/18
	Assets	The household does not own more than one radio, TV, telephone, bike, motorbike or refrigerator and does not own a car or truck.	1/18

Source: Own design (2018)

3.3.1.2 Logistic Regression Model

There are various techniques for identifying the determinants of poverty. The most widely used method for identifying the contribution of different indicators to poverty is a regression analysis. Among different frequently used regression analysis this study employed logit

regression to examine the determinants of poverty in small, and medium and large urban areas in Ethiopia since the dependent variable is binary, taking the value of 1 if the household or individual is poor and zero otherwise.

The probability of households falling into poverty is modeled as a function of the household head's characteristics: age, gender, marital status; the household's characteristics like size; region and area of residence.

To identify key determinants of poverty this study first computed a dichotomous variable indicating whether the household is poor or not. That is,

$$yi = \sum \begin{matrix} 1\ if\ household\ is\ poor \\ 0\ otherwise \end{matrix} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where yi denotes poverty status

Although both logit and probit models on the same axis, logit model has heavier tails due to greater spread of the distribution curve. These situation causes that logit model is better than probit model in larger sample size. This is because when the sample sizes an increase, probability of observes in tail increases too (Cacmakyapan & Goktas, 2013). Logit analysis produces statically sound results, which can be easily interpreted, and the method is simple to analyses. Assume the following basic model, it can be express the probability that *y*=1 as a cumulative logistic distribution function.

$$yi = \beta 0 + \beta 1xi + ei \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.. (2)$$

$$Pi = E\left(Y = \frac{1}{Xi}\right) = \beta 1 + \beta 2Xi \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

The cumulative Logistic distributive function can then be written as:

$$pi = \frac{1}{1+e^{-(\beta 1+\beta 2)}} = \frac{e^{zi}}{1+e^{zi}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots... (4)$$

Where $zi = \beta 1 + \beta 2Xi$

Pi= Prob(Y=1/X) is the response probability. The non-response probability (1- Pi) is also evaluated as:

$$1 - Pi = Prob(Y = 0/Xi) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

$$1 - pi = 1 - \frac{e^{\text{zi}}}{1+e^{\text{zi}}} = \frac{1}{1+e^{\text{zi}}} \text{.....} (6)$$

Note that the response and non- response probabilities both lie in the interval [0, 1]; *Zi,* ranges from $-\infty$ to $+\infty$, and hence, are interpretable. There is a problem with non-linearity in the previous expression, but this can be solved by creating the odds ratio $\frac{pi}{1+pi}$ and its log-transformation.

$$\frac{pi}{1+pi} = \frac{Prob\left(Y=\frac{1}{Xi}\right)}{Prob\left(Y=\frac{0}{Xi}\right)} = \frac{1+e^{zi}}{1+e^{-zi}} = e^{zi} \text{.....} (7)$$

$$Li = \ln\left(\frac{pi}{1+pi}\right) = zi = \beta 1 + \beta 2Xi \text{.....} (8) \text{ (Gujarati, 2004)}$$

Li is called the logit, thus, the log-odds is a linear function of the explanatory variables. The above transformation has certainly helped the popularity of the logit model. Note that for the linear probability model it is Pi that is assumed to be a linear function of the explanatory variables. The odds ratio can be interpreted as the probability of something happening to the Probability it will not happen. Accordingly, the estimated models used in this study presented as follow.

This study then used a Logistic regression model, given by

$$\begin{aligned} logit(p) &= \ln\{p|1-p\} \\ &= \beta 1 + \beta 2 sexhh + \beta 3 agehh + \beta 4 ruruldum + \beta 5 sizehh \\ &+ \beta 6 maritalstatushh + \beta 7 region \end{aligned}$$

To determine whether the predictors household head's characteristics: age, gender, marital status; the household's characteristics like size; and area of residence and region were associated with the poverty index yi.

Where x1…x6 are the predictor variables; size of household, age of household, marital status of household, sex of household, region and type of residence(small, medium and large towns), respectively and p denoted the probability that the household was poor, was used.

Definitions of Variables and Expected sign

Dependent variable: poverty index (mpipoor) (yi) measured in terms of multidimensional poverty to measure this study use three dimensions and ten indicators: health, standard of living, and education. The selections of these dimensions are based on the Sustainable Development Goals (SDGs) and Alkire Foster methodology.

Independent variables (xi): Based on theories of poverty and previous studies, six explanatory variables were identified and included in the model. The variables include type of residence (small, medium and large towns) (rurdum), age of household (agesqr), marital status (hh_maritaldum), sex of household (sexhh), region (saq01dum), and size of the household.

Age of the household head (agesqr): it is a continuous variable of households in years. This variable arranged between 15 and 99. At early head ages of household may more contribute to multidimensional poverty index and expected sign is positive.

Marital status of the household head (hh_maritaldum): This refers to the marital status of the household head and it is a dummy variable and expected sign is negative.

Household size (hhsize): size of the household may have a factor for poverty index. And this study expects having large family size in the household contribute more to poverty index. Therefore, positive sign expected.

Sex of the household head (sexhh): it is dummy variable that assume a value of "1" if sexhh is female, "0" if male. The female household head may have a tendency for poverty. Thus being women expected to have a positive sign on poverty index.

Region (saq01dum): region may have a factor for poverty index. In this study region represents the regions of Ethiopia which includes two city administrations these are Tigray, Afar, Amhra, Oromiya, Somalie, Benishangul-Gumiz, SNNP, Gambela, Harari, Addis Ababa and Diredwa. This variable is a dummy and reference variable is Diredwa. There may be regional difference in poverty index but the expected sign is unknown.

Types of residence (rurdum): create dummy 1 for medium and large towns, 0 for small towns. There may be living area difference in poverty index.

Table 3.2: Explanatory variables and direction of influence on dependent variables

S/N	Explanatory variable	Expected sign	Remark
1	Sex of household head (dummy)	Positive for being male	Male 0 Female 1
2	Age of household head	Negative	
3	Marital status (Dummy)	Either positive or negative	
4	Household Size	Positive	
5	Region (Dummy)	Either negative or positive	
6	Living area	Either negative or positive	1 medium and large towns, 0 small towns
Source: Own design (2018)			

CHAPTER FOUR

4. ANALYSIS OF DATA AND PRESENTATION

This part of the study presents results and a discussion. In the first part researchers do a descriptive statistical analysis of major variables. Then this study analyzed poverty using multidimensional poverty measure by the AF methodology and tests for different subgroup. Finally, the results of the determinants of poverty are presented and examine whether the deprived indicators have a significant impact on one dimensional poverty that measured by per capita expenditure.

4.1. Descriptive Statistics Result

This section presents the descriptive statistics of dependent and explanatory variables used in this study. The dependent variable used in this study is poverty status while explanatory variables are age of the household, sex of the household, marital status of the household, size of the household, region and type of resident. Through descriptive statistics, the study used mean, percentage and standard deviation.

Table 4.1 Descriptive statistics of major variables

Variables	Mean	standard deviation
Household size	4.216574	2.222101
Adult equivalent hh size	4.06954	2.110192
Age of household size	44.11281	15.0383
% of Male headed households	58.47	
% of Female headed households	41.53	
% of small town resident	27.99	
% of medium and large town resident	72.01	

Source: own computation from Stata data output result (2018)

Family size is an important factor in analyzing poverty. Household size matters for computing multidimensional poverty indices and for harnessing the economies of scale effect that could arise from bulk purchases for health, education and living standard. As given in Table 4.1, average household size is 4.22, on average; a household has about five members. Moreover, the age of the household head is on average about 44 years. About 58.47 % of the households are headed by males while only 41.53 % are headed by females. This headship and gender difference has considerable implications for resource allocations and poverty severity. Household headship is predominantly a male phenomenon. Further, multidimensional poverty index significantly varies both across living area and also gender wise. As one can see from Fig. 1, poverty is more of a small town's phenomenon. For both genders, mean multidimensional poor is higher in households in small towns as compared to those in large and medium towns.

The study can draw an inference for policy implications: one-size-fits-all poverty reduction policies may not bring impressive results. One should come up with poverty targeting policies which take into account the realities of households and regional disparities. The evidence presented by descriptive statistics and in the histogram can be further strengthened by empirical results from a poverty analysis using Alkire Foster methodology.

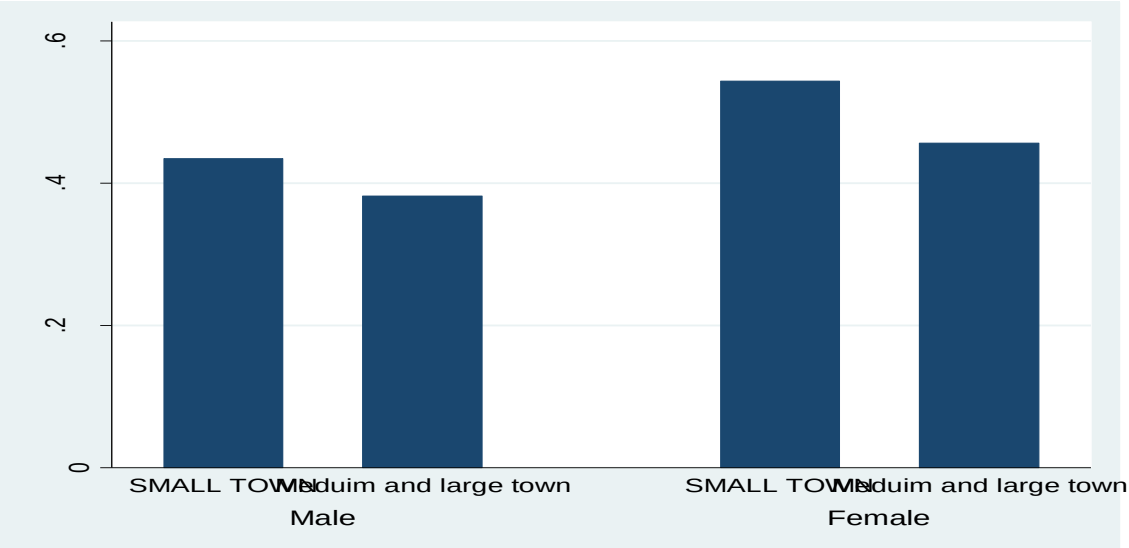


Fig. 4.1 Histogram of multidimensional poverty by area and gender

4.2. Overview of multidimensional poverty

4.2.1. Multidimensional poverty of urban (small, medium and large town) in Ethiopia

Table 4.2: Multidimensional poverty of urban (small, medium and large town) in Ethiopia 2015/16

Main results N = 1436

	Coef.	Std. Err.	[95% Conf.	Interval]
Main				
H	0.714	0.012	0.690	0.737
M0	0.329	0.006	0.317	0.340
Additional				
A	0.461	0.003	0.454	0.467

Note: Adjusted Multidimensional Headcount M0 = H*A

As we can see from Table 4.2, in urban (small, and medium and large towns) Ethiopian's 71.4 per cent are the multidimensional deprived headcount (the share of poor individuals in the population). According to the MPI, this means that they are in acute poverty. They are deprived at least either all the indicators of a single dimension or a combination across dimensions such as being in a household with lack of elementary functioning such as having access to good living conditions, in particular access to water, sanitation and cooking fuel, essential assets, electricity and flooring, lack access to education and health.

In this research the multidimensional poverty index shows on average the poor here are deprived in 46.1 per cent of the weighted indicators. According to MPI this means the average poor person is deprived in 46.1 per cent of the weighted indicators, so the intensity is 46.1 per cent. These are called "weighted" indicators, because to create the deprivation score each deprivation is entered according to its relative weight.

The MPI represents the share of the population that is multidimensionality poor adjusted by the intensity of the deprivation suffered. The 71.4 per cent figure is "adjusted" by the intensity of poverty, and that is why the MPI is calling the Adjusted Headcount Ratio. Therefore, Urban Ethiopia is deprived in 32.9 per cent of the total potential deprivations it could experience overall.

4.2.2. Aggregate Deprivation by indicator

Table 4.3: showing deprived individuals by indicator in urban (small, medium and large town) Ethiopia 2015/16

Summary of mpi indicators

Indicator	Type	Weight	Deprived
Domain 1			
nd_health1	Binary	.17	17.688 %
nd_health2	Binary	.17	57.103 %
Domain 2			
nd_school1	Binary	.17	17.409 %
nd_school2	Binary	.17	26.532 %
Domain 3			
nd_electricity	Binary	.06	56.337 %
nd_safewater	Binary	.06	19.916 %
nd_floor	Binary	.06	51.532 %
nd_sanitation	Binary	.06	81.476 %
nd_n_assets	Binary	.06	57.799 %
nd_cooking	Binary	.06	82.382 %

Deprived: Percentage of individuals whose indicator values are below the threshold.

The contribution of each indicator to multidimensional poverty is given in Table 4.3 the urban Ethiopia households deprived in cooking 82%, sanitation 81%; consulted medical assistance 57% and electricity use 56% were found to contribute the most positions respectively.

4.2.3. Aggregate Deprivation by dimensions

This section presents the extent of multidimensional poverty in urban areas of Ethiopia.

Table 4.4: Contribution of each dimension (domains) to urban (small, medium and large town) multidimensional poverty in Ethiopia 2015/16

Domain	M0
domain 1	0.325
domain 2	0.218
domain 3	0.457
Total	1.000

Contribution of each domain (%)

Table 4.4, indicates that the proportion of people who are poor and deprived in each dimensions. Domain 1, 2, 3 indicates health, education and living standard respectively. Highest deprivation in dimension is living standard 45.7%, health 32.5% and education 21.8% respectively.

4.3. Decomposition of poverty in various subgroups

Table 4.5: Decomposition of multidimensional poverty by urban (small, medium and large town) Ethiopia 2015/16

Decomposition by subgroups

MPI by: rural

	SMALL T~N	Meduim ~n	Total
H	0.744	0.702	0.714
M0	0.353	0.319	0.329
pop share	0.280	0.720	1.000

Indices by subgroup (absolute)

	SMALL T~N	Meduim ~n	Total
H	0.292	0.708	1.000
M0	0.300	0.700	1.000

Contribution of subgroups to indices (%)

As we can see in table 4.5 about 28 % or small portion of small town households were 35% multidimensionality poor as compared to about highest percentile 72 % of medium and large town households 31.9% MPI poor. Adjusted headcount poverty indices were lower than headcount poverty indices.

Table 4.6: Decomposition of multidimensional poverty by sex of household head in urban (small, medium and large town) Ethiopia 2015/16

Decomposition by subgroups

MPI by: hhheadsex

	Male	Female	Total
H	0.703	0.729	0.714
M0	0.313	0.350	0.329
pop share	0.586	0.414	1.000

Indices by subgroup (absolute)

	Male	Female	Total
H	0.577	0.423	1.000
M0	0.558	0.442	1.000

Contribution of subgroups to indices (%)

As we can see in table 4.6about35% of female headed households was multidimensionality poor as compared to about 31.3 % male headed households, though the percent of female headed household (41.4%) lower than male headed household (58.6%). Adjusted headcount poverty indices were lower than headcount poverty indices.

4.4. Logistic Regression

In literature on poverty analysis it is also common to do a regression analysis to identify factors responsible for the poverty status of households. Here this study runs a logit model to identify the determinants of poverty. This study conducted diagnostic analyses before running the model. As we can see from appendix 1 table 9, no one variable is correlated more than 0.8, therefore no correlation problem in this model. This study used stata command linktest to detect a specification error, and it is issued after the logit or logistic command as we can see from appendix 2 table 10, the variable _hat is statistically significant (with p-value = 0.000), so the model is well specified. The variable _hatsq is insignificant (with p-value = 0. 0.718). It tells us that this study have no specification error (since the linktest is insignificant). As we can see from appendix 3 table 11 the study has no faced multicolliniarity problem. Therefore it passes relevant diagnostic tests and fits well to the theory.

Table 4.7 presents logit regression result and also it presents the determinants of poverty. The probability of households living in large and medium town parts being poor is about 0.426 higher than for those living in small towns. Households with larger family sizes are more likely to be not poor. Household head with larger age are more likely to be poor. The significant factors that increase the probability of being poor are age of the household head, decrease in household size, and live in small towns. The significant factors that decrease the probability of being poor are living in medium and large towns. But marital status and sex of the household heads are insignificant or not a factor for multidimensional poverty index.

Table 4.7: logit model Result

Variables	Coef. (β)	Std. Err.	P>|z|
Sex of HH (female = 1, male = 0)	.1227127	.159246	0.441
Area of resident(Medium & large = 1, small town= 0)	.4258884	.1428607	0.003
Size of the HH	-.126964	.0296603	0.000
Age of HH	.0222879	.004704	0.000
Dummy for Tigray region	.7893634	.2880335	0.006
Dummy for Afar region	1.292481	.5897787	0.028
Dummy for Amhara region	1.185637	.2791062	0.000
Dummy for Oromia region	.8231356	.2724984	0.003
Dummy for Somalie region	1.942333	.4392058	0.000
Dummy for Benshangul region	.7806316	.6864149	0.255
Dummy for SNNP region	.7842921	.283765	0.006
Dummy for Gambela region	1.261459	.6042812	0.037
Dummy for Harar region	1.078521	.4344841	0.013
Dummy for Addis Ababa	.1469946	.2840227	0.605
Dummy for marital status (never married)	.272141	.2870891	0.343
Dummy for marital status (married monogamous)	-.110863	.2149335	0.606
Dummy for marital status (married polygamous	.8138291	.55938	0.146
Dummy for marital status (divorced)	.3687509	.2489579	0.139
Dummy for marital status (separated)	-.299268	.348106	0.390

As we can see from table 4.7 sex of the household and marital status of the household is insignificant factor for multidimensional poverty.

Area of residence; this explanatory variable is significant at 5% level of significance.

Regions; each of this explanatory variable are significant at 5% level of significance except Addis Ababa

Family size; this variable was also significantly and negatively influence multidimensional poverty at 5% level of significance. An increase family size decreases the probability of being multidimensional poor by 0.127, ceteris paribus. This figure reveals that the households whose family size increased have the probability of decreasing the multidimensional poverty rate by 12.7 percent than the borrowers who have less family size.

Age of the household; this variable was also significantly and positively influences multidimensional poverty at 5% level of significance. An increase age of the household increases the probability of being multidimensional poor by 0.022, ceteris paribus. This figure reveals that the households whose family size increased have the probability of decreasing the multidimensional poverty rate by 12.7 percent than the borrowers who have less family size.

Table 4.8: Marginal effects after the logit model

Variables	Marginal effect (dy/dx)	P>|z|
Sex of HH (female = 1, male = 0)	.1227127	0.439
Area of resident(Medium & large = 1, small town= 0)	.0963975	0.002
Size of the HH	-.0295892	0.000
Age of HH	.0051942	0.000
Dummy for Tigray region	.1662801	0.002
Dummy for Afar region	.232979	0.001
Dummy for Amhara region	.2413817	0.000
Dummy for Oromia region	.1768501	0.001
Dummy for Somalie region	.3044482	0.000
Dummy for Benshangul region	.1583677	0.170
Dummy for SNNP region	.1667247	0.002
Dummy for Gambela region	.2288465	0.002

Dummy for Harar region	.2060517	0.001
Dummy for Addis Ababa	.0337465	0.599
Dummy for marital status (never married)	.0613425	0.325
Dummy for marital status (married monogamous)	-.0257725	0.605
Dummy for marital status (married polygamous	.1643674	0.077
Dummy for marital status (divorced)	.0821956	0.118
Dummy for marital status (separated)	-.0718823	0.401

Note: Reference group for regional dummies is Dire Dawa, and for marital status is widowed

Table 4.8 presents' marginal effects after a logit regression result and also it presents the determinants of poverty. The odd ratio of the econometric result indicates that the probability of a household who live in medium and large towns to be poor is 0.096 as compared to household who live in small towns. The probability of Tigray region to be poor is 0.167 as compared to Dire Dawa. The probability of Afar region to be poor is 0.233 as compared to Dire Dawa. The probability of Amhara region to be poor is 0.241 as compared to Dire Dawa. The probability of Oromiya region to be poor is 0.177 as compared to Dire Dawa. The probability of Somalie region to be poor is 0.304 as compared to Dire Dawa. The probability of SNNP region to be poor is 0.167 as compared to Dire Dawa. The probability of Gambela region to be poor is 0.223 as compared to Dire Dawa. The probability of Harari region to be poor is 0.206 as compared to Dire Dawa.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATION

In this study using household survey data obtained from CSA-World Bank-Ethiopian rural Socioeconomic Survey (ERSS-2015/16), this study analyzed the extent and determinants of poverty. The analysis employed both the logistic regression method of poverty analysis and a multidimensional approach. The study performs multidimensional measurement of poverty analysis using three dimensions: education, health, and living standard. The AF analysis result shows in urban Ethiopian's there is an extremely high poverty incidence 71.4 per cent and relatively low average deprivation share across the poor poverty intensity 46.1 per cent. They are deprived at least either all the indicators of a single dimension or a combination across dimensions such as being in a household with lack of elementary functioning such as having access to good living conditions, in particular access to water, sanitation and cooking fuel, essential assets, electricity and flooring, lack access to education and health. Therefore, efforts need to be made to improve these deprivations through access to water and sanitation systems, cooking facilities, electricity access and educational opportunities and improve access to healthcare.

In this research the multidimensional poverty index analysis reveals that the poorest of the poor are those residing in small town areas compared to medium and large towns even if the difference is low. And also our results indicate that greater attention needs to be directed towards women because they experience a greater breadth and severity of multiple deprivations relatively. This implies that programs should target to reduce the number of poor urban households. Targeting programs in living standard, health and education dimension will reduce poverty substantially. It can be achieved by enforcing policies and collaborate with foreign concerned organs.

The logit regression result illustrates the probability of households living in large and medium town parts being poor are about 0.426 higher than for those living in small towns. Households with larger family sizes are more likely to be not poor. Household head with larger age are more likely to be poor. Sex of the household head is insignificant or not a factor for multidimensional poverty index.

The significant factors that increase the probability of being poor are age of the household head, decrease in household size, and live in small towns. The significant factors that decrease the probability of being poor are living in medium and large towns. But marital status and sex of the household heads are insignificant.

In general the findings of this study have important implications for interventions designed to reduce the multidimensional poverty in urban Ethiopia and attempts to make further contribution to the previous studies and can be used as a spillover for further research in the study area.

Based on the findings of the study, the following policy recommendations are given: Most studies were conducted in one-dimensional poverty approach, but this could not show the deprivation level of households in various dimensions. So in order to have a good picture of poverty status of the household, studies should be conducted in multidimensional aspect. Poverty affects people of different characteristics in different ways; because they play different roles, have different needs and face different shocks, constraints and opportunities. Policy makers should target gender specific parameter in designing poverty targeting policy and strategies. Moreover, all size fit one poverty reduction should not be attempted. If a policy makers need to get the most desired result in combating poverty; residence of living, region and climate condition should be considered. However, this study did not address the changes of multidimensional poverty from time to time which needs further research.

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Appendix

Appendix 1: Test correlation

Table 9: correlation test

```
. corr mpipoor sexhh rurdum hhsize hhheadage  region1  region2 region3  region4 region5  re
> gion6 region7  region8 region9  region10  region11 hh_maritaldum1 hh_maritaldum2 hh_marit
> aldum3 hh_maritaldum4 hh_maritaldum5
(obs=1434)
```

	mpipoor	sexhh	rurdum	hhsize	hhhead~e	region1	region2	region3
mpipoor	1.0000							
sexhh	0.0792	1.0000						
rurdum	0.1176	-0.0422	1.0000					
hhsize	-0.1234	-0.2496	0.1024	1.0000				
hhheadage	0.1057	0.0815	0.0211	0.1484	1.0000			
region1	0.0211	0.1241	-0.0545	-0.0292	0.0696	1.0000		
region2	0.0287	-0.0109	0.0637	-0.0058	-0.0114	-0.0457	1.0000	
region3	0.1150	0.0351	0.0806	-0.1507	-0.0163	-0.1973	-0.0580	1.0000
region4	-0.0081	-0.1010	0.0819	0.0210	-0.0849	-0.2080	-0.0611	-0.2638
region5	0.0850	0.0056	0.0669	0.0825	0.0078	-0.0795	-0.0234	-0.1008
region6	0.0095	-0.0307	0.1474	0.0324	-0.0012	-0.0362	-0.0106	-0.0460
region7	-0.0204	-0.0999	0.1243	0.1108	-0.0407	-0.1741	-0.0512	-0.2209
region8	0.0155	-0.0490	0.0522	0.0076	-0.0529	-0.0419	-0.0123	-0.0531
region9	0.0198	0.0058	-0.1014	-0.0178	0.0265	-0.0642	-0.0189	-0.0814
region10	-0.1321	0.0762	-0.2450	0.0502	0.1113	-0.1551	-0.0456	-0.1967
region11	-0.1015	0.0156	-0.1474	-0.0567	-0.0169	-0.0933	-0.0274	-0.1183
hh_marital~1	0.0214	0.0301	-0.1021	-0.3000	-0.3251	-0.0624	-0.0355	0.0397
hh_marital~2	-0.1268	-0.6088	0.0626	0.3635	-0.1092	-0.0940	0.0247	-0.0322
hh_marital~3	0.0470	-0.0657	0.0519	0.1023	0.0152	-0.0196	0.0324	-0.0109
hh_marital~4	0.0914	0.2866	0.0011	-0.1689	0.0086	0.1814	-0.0005	0.0699
hh_marital~5	-0.0273	0.1519	-0.0164	-0.0801	-0.0364	-0.0138	-0.0211	-0.0218

	region4	region5	region6	region7	region8	region9	region10	region11
region4	1.0000							
region5	-0.1063	1.0000						
region6	-0.0484	-0.0185	1.0000					
region7	-0.2329	-0.0890	-0.0406	1.0000				
region8	-0.0560	-0.0214	-0.0098	-0.0469	1.0000			
region9	-0.0858	-0.0328	-0.0150	-0.0719	-0.0173	1.0000		
region10	-0.2073	-0.0793	-0.0361	-0.1736	-0.0418	-0.0640	1.0000	
region11	-0.1247	-0.0477	-0.0217	-0.1045	-0.0251	-0.0385	-0.0930	1.0000
hh_marital~1	0.0437	-0.0232	-0.0281	0.0063	0.0149	-0.0498	0.0258	-0.0280
hh_marital~2	0.0699	-0.0322	0.0163	0.0824	0.0503	-0.0304	-0.0379	0.0001
hh_marital~3	-0.0161	0.1140	-0.0120	0.0159	-0.0139	0.0131	-0.0353	-0.0066
hh_marital~4	-0.0837	-0.0230	0.0674	-0.1159	-0.0152	0.0435	-0.0497	-0.0112
hh_marital~5	0.0191	-0.0163	-0.0167	-0.0054	-0.0193	-0.0047	-0.0018	0.0806

	hh_mar~1	hh_mar~2	hh_mar~3	hh_mar~4	hh_mar~5
hh_marital~1	1.0000				
hh_marital~2	-0.3591	1.0000			
hh_marital~3	-0.0400	-0.1529	1.0000		
hh_marital~4	-0.1059	-0.4051	-0.0451	1.0000	
hh_marital~5	-0.0558	-0.2134	-0.0238	-0.0629	1.0000

As we can see from above table 9, no one variable is correlated more than 0.8, therefore no correlation problem in this model.

Appendix 2: Test Specification Error

Stata command linktest can be used to detect a specification error, and it is issued after the logit or logistic command.

Table 10: linktest

```
.
. *Stata command linktest can be used to detect a specification error, and it is issued aft
> er the logit or logistic command

.
. linktest

Iteration 0:   log likelihood = -954.71672
Iteration 1:   log likelihood = -887.06554
Iteration 2:   log likelihood = -885.57481
Iteration 3:   log likelihood = -885.56664
Iteration 4:   log likelihood = -885.56664

Logistic regression                             Number of obs   =       1434
                                                LR chi2(2)      =     138.30
                                                Prob > chi2     =     0.0000
Log likelihood = -885.56664                     Pseudo R2       =     0.0724

------------------------------------------------------------------------------
     mpipoor |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       _hat |   .9611031   .1408883     6.82   0.000     .6849672    1.237239
     _hatsq |   .0380336   .1052888     0.36   0.718    -.1683286    .2443959
      _cons |  -.0049438   .0701562    -0.07   0.944    -.1424474    .1325598
------------------------------------------------------------------------------

.
. * we have checked the model have no spesificatin error
```

This study first see in the output from the logit command and in the linktest that followed, the variable _hat statistically significant (with p-value = 0.000), so the model is well specified. The variable _hatsq is insignificant (with p-value = 0.718). It tells us that this study have not specification error (since the linktest is insignificant).

Appendix 3: Test Goodness-of-fit

Commonly used test of model fit is the Hosmer and Lemeshow's goodness-of-fit test

Table 11: Goodness-of-fit

```
. ***Test Goodness-of-fit

.
. *commonly used test of model fit is the Hosmer and Lemeshow's goodness-of-fit test

.
. lfit, group(10) table

Logistic model for mpipoor, goodness-of-fit test

  (Table collapsed on quantiles of estimated probabilities)
```

Group	Prob	Obs_1	Exp_1	Obs_0	Exp_0	Total
1	0.4084	47	51.0	97	93.0	144
2	0.4860	73	65.1	70	77.9	143
3	0.5321	71	73.3	73	70.7	144
4	0.5804	76	80.2	68	63.8	144
5	0.6231	94	85.8	48	56.2	142
6	0.6582	95	92.1	49	51.9	144
7	0.7048	83	97.4	60	45.6	143
8	0.7482	106	104.6	38	39.4	144
9	0.8138	114	111.5	29	31.5	143
10	0.9649	125	123.0	18	20.0	143

```
      number of observations =      1434
            number of groups =        10
   Hosmer-Lemeshow chi2(8) =        12.37
               Prob > chi2 =         0.1353
```

With a p-value of 0.13, we can say that Hosmer and Lemeshow's goodness-of-fit test indicates that our model fits the data well.

Appendix 4: Test multicollinearity

```
. _rmcoll mpipoor sexhh rurdum hhsize hhheadage region1  region2 region3  region4 region5
> region6 region7  region8 region9  region10    hh_maritaldum1 hh_maritaldum2 hh_maritaldum
> 3 hh_maritaldum4 hh_maritaldum5
```

After the study has checked through the above command this study has no faced multicolliniarity problem.

Appendix 5: Logit result

Table 12: Logit result

```
.
. logit mpipoor sexhh rurdum hhsize hhheadage region1 region2 region3  region4 region5  reg
> ion6 region7  region8 region9  region10 hh_maritaldum1 hh_maritaldum2 hh_maritaldum3 hh_m
> aritaldum4 hh_maritaldum5

Iteration 0:   log likelihood = -954.71672
Iteration 1:   log likelihood = -886.44521
Iteration 2:   log likelihood = -885.63341
Iteration 3:   log likelihood = -885.63259
Iteration 4:   log likelihood = -885.63259

Logistic regression                               Number of obs   =       1434
                                                  LR chi2(19)     =     138.17
                                                  Prob > chi2     =     0.0000
Log likelihood = -885.63259                       Pseudo R2       =     0.0724
```

mpipoor	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
sexhh	.1227127	.159246	0.77	0.441	-.1894038	.4348291
rurdum	.4258884	.1428607	2.98	0.003	.1458866	.7058902
hhsize	-.1269642	.0296603	-4.28	0.000	-.1850973	-.0688311
hhheadage	.0222879	.004704	4.74	0.000	.0130683	.0315076
region1	.7893634	.2880335	2.74	0.006	.2248281	1.353899
region2	1.292481	.5897787	2.19	0.028	.1365364	2.448426
region3	1.185637	.2791062	4.25	0.000	.6385994	1.732676
region4	.8231356	.2724984	3.02	0.003	.2890486	1.357223
region5	1.942333	.4392058	4.42	0.000	1.081506	2.803161
region6	.7806316	.6864149	1.14	0.255	-.5647168	2.12598
region7	.7842921	.283765	2.76	0.006	.2281229	1.340461
region8	1.261459	.6042812	2.09	0.037	.0770893	2.445828
region9	1.078521	.4344841	2.48	0.013	.2269473	1.930094
region10	.1469946	.2840227	0.52	0.605	-.4096798	.7036689
hh_maritaldum1	.2721471	.2870891	0.95	0.343	-.2905372	.8348314
hh_maritaldum2	-.1108635	.2149335	-0.52	0.606	-.5321254	.3103984
hh_maritaldum3	.8138291	.55938	1.45	0.146	-.2825355	1.910194
hh_maritaldum4	.3687509	.2489579	1.48	0.139	-.1191977	.8566995
hh_maritaldum5	-.2992683	.3484106	-0.86	0.390	-.9821404	.3836039
_cons	-.8992112	.4140866	-2.17	0.030	-1.710806	-.0876165

Note Reference group for regional dummies is Dire Dawa, and for marital status is widowed

Appendix 6: Marginal effects after the logit model

Table 13: Marginal effects after the logit model

```
. mfx

Marginal effects after logit
      y  = Pr(mpipoor) (predict)
         =  .63018545
```

variable	dy/dx	Std. Err.	z	P>|z|	[95% C.I.]		X
sexhh*	.028513	.03688	0.77	0.439	-.043766	.100792	.414923
rurdum*	.0963975	.03119	3.09	0.002	.035265	.15753	.279637
hhsize	-.0295892	.00689	-4.29	0.000	-.0431	-.016079	4.21618
hhhead~e	.0051942	.00109	4.76	0.000	.003055	.007334	44.1172
region1*	.1662801	.05333	3.12	0.002	.061756	.270804	.134589
region2*	.232979	.07241	3.22	0.001	.091054	.374904	.01325
region3*	.2413817	.04749	5.08	0.000	.148313	.334451	.200139
region4*	.1768501	.05286	3.35	0.001	.073247	.280454	.217573
region5*	.3044482	.03666	8.30	0.000	.232596	.3763	.039052
region6*	.1583677	.1155	1.37	0.170	-.06801	.384746	.008368
region7*	.1667241	.05369	3.11	0.002	.061492	.271956	.16318
region8*	.2288465	.07552	3.03	0.002	.08083	.376863	.011158
region9*	.2060517	.06258	3.29	0.001	.083395	.328709	.025802
region10*	.0337465	.06417	0.53	0.599	-.092017	.15951	.133891
hh_mar~1*	.0613425	.0623	0.98	0.325	-.060759	.183444	.085774
hh_mar~2*	-.0257725	.04983	-0.52	0.605	-.123437	.071892	.578801
hh_mar~3*	.1643674	.09293	1.77	0.077	-.017767	.346501	.016736
hh_mar~4*	.0821956	.05264	1.56	0.118	-.020973	.185364	.106695
hh_mar~5*	-.0718823	.08567	-0.84	0.401	-.239786	.096022	.032078

```
(*) dy/dx is for discrete change of dummy variable from 0 to 1
```

Note: the reference variable for region is Dire Dawa and for marital status is widowed.