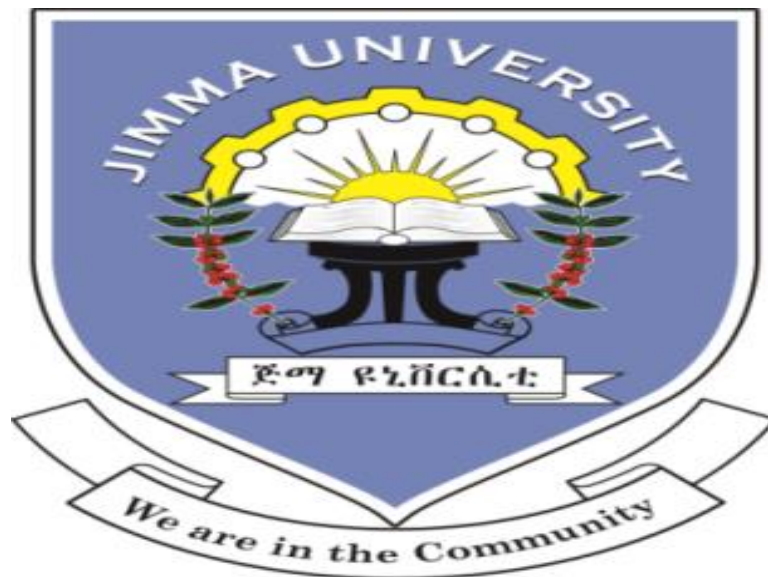


**The Implication of Female Household Headship on
Multidimensional Urban Poverty: Evidence from Selected Sub-
Saharan Africa Countries**

By:

AMLAKSETEGN ZENEBE EDE'O

A Thesis Submitted to the School of Graduate Studies of Jimma University
in Partial Fulfillment of the Requirements for the Award of the Degree of
Masters of Science in Economics (Economic Policy Analysis)



**JIMMA UNIVERSITY
COLLEGE OF BUSINESS & ECONOMICS
DEPARTMENT OF ECONOMICS**

June 5, 2017

Jimma, Ethiopia

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Under the guidance of

Badassa Wolteji (Ph.D.)

And

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Declaration

I hereby declare that this thesis entitled “The Implication of Female Household Headship on Multidimensional Urban Poverty: Evidence from Selected Sub-Saharan Africa Countries”, has been carried out by me under the guidance and supervision of Badassa Wolteji (Ph.D.) And Jibril Haji (Assistant Professor).

The thesis is original and has not been submitted for the award of the degree of diploma in any university or institution.

Researchers name

Date

Signature

Certificate

This is to certify that the thesis entitled “The Implication of Female Household Headship on Multidimensional Urban Poverty: Evidence from Selected Sub-Saharan Africa Countries”, submitted to Jimma University for the award of the degree of masters of science in economics (economic policy analysis) and is a record of valuable research work carried out by Mr. Amlaksetegn Zenebe, under our guidance and supervision.

Therefore we hereby declare that no part of this thesis has been submitted to any other university or institution for the award of any degree of diploma.

Main advisor’s name

Date

Signature

Co-advisor’s name

Date

Signature

Abstract

The main purpose of this study was to analyze the linkage between female household headship and multidimensional urban poverty in SSA. The study utilized household level cross country data from four selected countries in the region. It used the Alkire-Foster multidimensional poverty approach to compare the wellbeing of Female-Headed Households with their Male-Headed counterparts from a multidimensional perspective. The study also applied multilevel mixed effect logistic regression models to investigate household and country level determinants of multidimensional poverty among households.

The results showed that more percentage of Female-Headed Households are poor than Male-Headed Households, which implies the existence of feminization of multidimensional urban poverty in the studied countries. The regression results, too, showed that gender of the household head has a significant effect on poverty and female-headed households are fifteen percent more likely to be multidimensionally poor than male-headed households. Among household level variables access to finance, the highest level of education the household head completed, age of the household head and employment status have positive and significant effect on multidimensional wellbeing of households. Whereas, household size and marital status have negative effect on the probability of being multidimensionally poor. And two macro level government policies (expenditure on primary school per student and health expenditure per capita) have a significant effect on the multidimensional wellbeing of households. The effect of these variables was different for male-headed and female-headed households. Thus anti-poverty policies and programs that are targeted to mitigate differences in household characteristics between the two genders are recommended.

Key words: Female-Headed Households, Multidimensional urban Poverty, Multilevel mixed effect logistic regression

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Table of Contents

Declaration.....	i
Certificate.....	ii
Abstract.....	iii
Acknowledgment.....	iv
Table of Contents.....	v
Acronyms.....	viii
CHAPTER ONE.....	1
INTRODUCTION.....	1
1.1. General Background.....	1
1.2. Problem Statement.....	3
1.3. Objectives of the study.....	5
1.4. Significance of the study.....	5
1.5. Scope and limitation of the study.....	6
1.6. Organization of the Thesis.....	7
CHAPTER TWO.....	8
LITERATURE REVIEW.....	8
2.1. Theoretical Framework.....	8
2.1.1. Female Household Headship: concepts and definition.....	8
2.1.1.2. Causes of female headship.....	10
2.1.2. Poverty: Concepts and Definitions.....	11
2.1.2.1. Urban poverty.....	12
2.1.3. Measuring Poverty.....	13
2.1.3.1. Unidimensional approach.....	14
2.1.3.2. Multidimensional Methods.....	17
2.1.3.3. Alkire Foster (AF) methodology.....	19
2.2. Empirical literature.....	21
2.2.1. Feminization of poverty.....	21
2.2.2. Determinants of poverty.....	24
CHAPTER THREE.....	29
METHODOLOGY OF THE STUDY.....	29
3.1. Data and Sources.....	29

3.2. Poverty Analysis	31
3.2.1 Poverty measurement: the adjusted headcount ratio	32
3.2.2. Unit of identification, dimensions, indicators, weights and cutoffs.....	35
3.3. Determinants of poverty: Multivariate analysis.....	39
3.3.1. Description of study variables.....	46
CHAPTER FOUR.....	49
RESULTS AND DISCUSSION	49
4.1. Characteristics of sample households by gender of household head (GHH) and country ..	49
4.2. Multidimensional Poverty analysis.....	55
4.2.1. Extent of multidimensional poverty.....	55
4.2.2. Feminization of Multidimensional Poverty	59
4.2.3. Determinants of multidimensional poverty.....	62
CHAPTER FIVE	68
CONCLUSIONS AND RECOMMENDATIONS	68
5.1. Summary and conclusion.....	68
5.2. Recommendations.....	71
References.....	74

List of tables

Table 3.1. Sample households by country and gender of household head	36
Table 3.2. Dimensions, indicators, weights and deprivation cutoffs used in the study	42
Table 4.1. Percentage of household head age groups	55
Table 4.2 percentage of household heads at different levels of education	57
Table 4.3 percentage of households with different household size	59
Table 4.4 Multidimensional urban poverty in SSA	60
Table 4.5 Multidimensional urban poverty in selected SSA countries	61
Table 4.6 Multidimensional urban poverty in SSA by gender of household head	63
Table 4.7 Multidimensional urban poverty in selected SSA countries by gender of household head	64
Table 4.9 Determinants of Multidimensional Urban Poverty Multilevel Logistic Models Results	67

List of Figures

Figure 4.1. Percentage of households with access to financial services	54
Figure 4.2 percentage of employed household heads	56
Figure 4.3 percentage of married household heads	58
Figure 4.4 contribution of each indicator to multidimensional poverty	62
Figure 4.5 incidence of deprivation in the ten indicators	62
Figure 4.6 Raw headcount ratios of multidimensional urban poverty in SSA at different poverty cutoffs	65
Figure 4.7 Adjusted headcount ratios of multidimensional urban poverty in SSA at different poverty cutoffs	65

Acronyms

AF	Alkire Foster (methodology)
BMI	Body Mass Index
CSA	Central Statistics Agency of Ethiopia
DHS	Demographic and Health Survey
FGT	Foster-Greer-Thorbecke (measures of poverty)
FHH	Female Household Head
FHHs	Female-Headed Households
GHH	Gender of the Household Head
GHS	Ghana Health Service
GSS	Ghana Statistical Service
HPI	Human Poverty Index
MDGs	Millennium Development Goals
MHH	Male Household Heads
MHHs	Male-Headed Households
MoH	Ministry of Health
MPI	Multidimensional Poverty Index
NISR	National Institute of Statistics of Rwanda
OPHI	Oxford Poverty and Human Development Initiative
PCA	Principal Component Analysis
SSA	Sub-Saharan Africa
UNDP	United Nations Development Program

CHAPTER ONE

INTRODUCTION

1.1. General Background

Nowadays stories, news and reports that feature Africa are mostly different from those encountered a decade ago. The second decade of the 21st century is being mentioned as the time of a rising Africa. The continent is showing undeniable progress in many aspects including the wellbeing of its population. Speaking of wellbeing, the overall population of Africa saw a substantial modification in most dimensions of livelihood. But this progress is not a case for every African nation, rather a mixed in which some countries showed a clear advancement and some others did experience little or no economic growth and development. And even within a country some parts of the population still remain disadvantaged (Beegle et al, 2016).

Whether women are among those who are disadvantaged is a pertinent question to be raised in relation to the observed economic growth and decline of poverty in Africa. In other words, are women equally benefitted from the advancements their countries has made? Or what is the poverty status of women as compared to men? Answering these questions is very critical because women constitute half of the population that brought this change and to be benefitted from the change they worked for is their right.

Irrespective of their location, urban or rural, women highly suffer from income and other related deprivations (or poverty) as compared to their male counterparts. They experience multiple forms of deprivations such as women specific ill health, low levels of education coupled by smaller class attendance ratio, lack of adequate representation in leadership positions in spite of their significant share in the population, and longer working days but lower pays (Chant, 2011). They are also alienated from different social and economic rights such as access to credit, land and/or other productive resources (Rustagi, 2006). When it comes to only urban areas these problems appear prevalent, if not worse. Women in cities often suffer disproportionately because they experience greater difficulty in accessing resources and services tailored towards their needs, and they lack decision-making opportunities (Tacoli, 2012).

The ever increasing urbanization in developing countries is often associated with gender-related transformations. One of these changes is the greater involvement of women in both formal and informal paid employments that resulted from a wider range of job opportunities in the growing cities than in rural areas. This, subsequently, has demographic implications including a decline in fertility levels, often higher proportions of women in the overall urban population, and a concentration of Female-Headed Households (FHHs) in urban centers (Chant, 2007; Tacoli, 2012). Gradually these changes exacerbate the variety and intensity of gender-related difficulties only women in urban areas face. In the traditional development literature, this gender dimension of poverty is called “feminization of poverty”. Feminization of poverty is a notion that women constitute the poorest of the poor and a disproportionate number of women are overburdened by poverty and calamities associated with it (Chant, 2007). Thus the examination of gender dimensions of urban poverty shall be considered enormously critical both for a better understanding of the inter-linkages (of gender and poverty) as well as for effective policy interventions in urban parts of the developing world, obviously, Sub-Saharan Africa is not an exception.

The studies made on feminization of poverty were initially constrained by the limited availability of means to estimate women specific dimensions of poverty. In 1980s scholars suggested the relative vulnerabilities of FHHs to be used as a proxy for the multifaceted poverty faced by women (Rustagi, 2006; Tacoli, 2012). FHHs have, therefore, become a focus of economic and social research both in developing and developed nations. Most of the studies, since then, trace their rationale of studying the relationship between women household headship and poverty to the fact that the number of households headed by women has been rising and with the assertion that these households highly suffer from the burden of poverty and vulnerability (Chant, 2006; Rogan, 2014).

Even though there exists an academic dispute whether female-headed households are prone to poverty than their male-headed counterparts, many studies conducted on the issue affirmed that there is a strong and positive relationship between female household headship and the prevalence of poverty (Takane, 2007; Berhanu, 2011; Adeoti 2014; Rogan, 2014). Therefore it is of greater necessity to conduct a deeply rooted examination of the status of poverty among female-headed households so that we can understand whether there exists

feminization of poverty in the Sub-Saharan Africa region and produce alleviating policies and programs if the case happens to be true. But still there remain some unsettled issues among studies on the implication of female household headship on poverty. These dissimilarities evolve around on answers for the questions: what really represents the wellbeing of FHHs, how to measure their poverty status, what contributes to their poverty, and what the association of their socioeconomic status and their poverty status is, etc. With this context, this study aims at a well-articulated analysis of the mentioned unsettled relationship between female household headship and urban poverty through the use of multidimensional poverty analysis.

1.2. Problem Statement

A crucial step for a good study on feminization of poverty involves the decision about how to measure poverty. The way we measure poverty should enable us to answer the question about the presence of a difference between the wellbeing of men and women. Simple national aggregate considerations of poverty often mistreat differences between men and women. These differences usually are in terms of their access to income, resources and services. A gender equality standpoint draws attention to the need for gender-sensitive measurements of poverty that can be applied to check the equality between the two gender groups (Chant, 2006; Rogan, 2014).

According to World Bank (2011), one of the three key dimensions of gender equality is an accumulation of endowments. The endowments could be in terms of health, education and assets, which are the various forms of multiple deprivations women face. The conventional monetary poverty lines give little attention to these health and social indicators, hence fails to demonstrate the social and health dimensions of urban poverty which are disproportionately borne by women (Roger, 2014). This failure of the monetarist approach to address this issue of multiple deprivations raises the importance of a multidimensional lens to complement the income-based unidimensional approach. A multidimensional approach also potentially carries more direct implications for policy (Alkire and Santos, 2010).

Following a series of seminal works by Amartya Sen, a Nobel Laureate in Economics, since 1976 well-being and poverty are now seen as multidimensional phenomena. The well-being of women depends, thus, on several dimensions such as health, education, empowerment, social inclusion etc. in addition to income (Batana, 2013). Despite this recognition of poverty as multidimensional phenomenon its assessment continues to be conducted almost exclusively in terms of income (or expenditure) following the unidimensional monetarist approach. This practice is, partly, prevalent because of the assumption that low household incomes are causally linked with other deprivation indicators, such as low levels of education and longevity (Balisacan, 2011). But Klasen (2000, cited in Alkire (2011)) found that while the overall expenditure and levels of deprivation were strongly correlated; the correlations were weaker for the most deprived and certain population groups, such as female-headed households. This may provide one justification for recent studies on gender dimensions of poverty to suggest the multidimensional poverty approach than unidimensional monetarist methodology.

To the researchers' limited knowledge, the studies made on the relationship between female household headship and poverty in Africa generally and SSA specifically has been usually carried out in a unidimensional perspective. This means that only one dimension of life, such as income, consumption, food expenditure, nutrition and/or Body Mass Index (BMI) has been used as an approximation to the population economic wellbeing. See for example Kodama (2006), Adeyemi, Ijaiya and Raheem (2009), Berhanu (2011), Sekhamu (2012), Jayamohan and Amenu (2014), Prince (2014). But these studies, using a single variable, could not provide a full understanding of feminization of poverty. This is because using only one variable, that can represent only a single aspect, cannot address all of the multiple deprivations that woman headed households experience.

Based on the fact that the traditional unidimensional poverty assessment is now deemed incomplete as it disregards non-monetary dimensions of poverty and the interaction between these many dimensions of deprivations, this paper uses multidimensional poverty analysis methodology that is suggested by economists to overcome these limitations. By doing so, this study tries to systematically examine the nature, intensity and sources of multidimensional urban poverty among FHHs in SSA.

The other gap in the existing literature of feminization of poverty is associated with the analysis of determinants of poverty. Studies usually model a single equation for all households and study the impact of being female-headed on poverty. But a better understanding requires examination of the effect of socio-economic and demographic factors on the poverty status of female-headed and male-headed households separately. Therefore in this study we model the likelihood for the incidence of multidimensional poverty among female-headed and male-headed households using separate equations.

In addition to estimating separated models for female-headed and male-headed households, this research goes a step by its application of advanced multilevel modeling. The multilevel models are estimated using household data from multiple countries. Simultaneous consideration of micro and macro determinants of household level multidimensional poverty is also another contribution by this study.

1.3. Objectives of the study

The overall objective of this study is to analyze the linkage between female household headship and multidimensional urban poverty in SSA.

Specifically, the following are the objectives of the study:

- To estimate the overall multidimensional urban poverty in the sample countries.
- To measure the state of multidimensional urban poverty among female-headed households in SSA and making comparisons with their male-headed counterparts
- To examine household and country level factors that influence the multidimensional poverty status of households

1.4. Significance of the study

In addition to its global coverage, it is now widely recognized that poverty is multidimensional in nature and complex in appearance. Like the rest of the developing countries, inhabitants of urban areas in SSA are being challenged by the prevailing level and complexity of poverty. The problem is worse when the focus is on females. One of the

reasons might be the fact that the socio-economic structure looks as if it is somewhat biased against them.

Therefore studies that measure the extent of poverty women (or their research proxy FHHs) face are of greater importance, to have policies that can resolve this problem. So far the studies in SSA focused on the application of unidimensional monetary indices leaving a larger knowledge gap in relation to non-monetary dimensions of wellbeing. Thus this study is significant in that way it provides insight about non-monetary dimensions of poverty, applying multidimensional poverty analysis.

The use of multidimensional poverty approach in this study has interesting empirical contribution because it goes beyond the previous studies, on the same concern, by simultaneously taking account of additional dimensions of health, education and living standards. These dimensions are further classified into ten specific indicators which enable a closer understanding of the feminization of poverty. This methodology also allows considering the joint distribution of deprivations (what actually exists in reality), which makes it to be used to analyze the complex nature of urban poverty female-headed households face. The study also checks the social, economic and demographic factors that determine the observed multidimensional poverty. Therefore it can, at least, be a reference on the issue and indicate further ways to consider in analyzing the poverty within female-headed households.

1.5. Scope and limitation of the study

Poverty is a broad concept, which can be seen from different perspectives such as economic, gender, political, legal etc. It is also possible to look at poverty from spatial perspectives, urban and rural contexts. But, it is impossible to cover all of the dimensions and contexts of poverty in this single study. Therefore, this study is confined to the assessment of the incidence and intensity of multidimensional poverty and its determinants only among urban households in selected SSA countries.

1.6. Organization of the Thesis

This thesis has five chapters. Chapter one introduces the problem to be studied and why and how we studied. The second chapter presents a framework for the study and assesses related literature. Chapter three discusses the methodology used for the research. Chapter four presents analysis results and discussion of the results. And the fifth chapter summarizes the research and concludes about the problem studied finally the chapter forwards policy implications and further research directions.

CHAPTER TWO

LITERATURE REVIEW

2.1. Theoretical Framework

2.1.1. Female Household Headship: concepts and definition

Much attention has been drawn to the idea of feminization of poverty in recent years, thus the study of female headship of households and its impact on poverty is being studied for many years in economics literature. But the studies are not on full agreement, rather controversial, starting from the definition of a household and who is to be regarded as head of a household and what the criteria for deciding the head is. This sub-section discusses these issues in the context we are using in this study.

A household is an important economic unit and the head of this economic unit plays a decisive and significant role. The term head of household is used to cover a number of different concepts referring to the chief economic provider, chief decision maker, the person designated by other members as the head, etc. (Tsehay, 2007). The focus changes depending on specific circumstances of a country. For example in developing countries like those in SSA, traditionally, the male partner or the husband in a household is usually regarded as the head of the household irrespective of his contributions. This might be because, among others, men are bestowed with greater power or influence in the family or household due to the socially-constructed control over the general affairs of the family. This influence includes decision making in economic, social and political affairs concerning the household. Generally, the definitions of head of household in many contexts reflect the stereotype of the man in the household as the person in authority and bread winner, even if he may not. According to Kabeer (2003), in official data collections conducted both at micro and macro level, men are usually recognized as family heads without due deliberations to the real economic significance or contributions of the female member.

A nuclear household is usually headed by a man who plays a father role and a woman who plays a mother role in a cooperative manner. But for different reasons, there are also cases where the male partner is absent or is not playing his role and the households are headed by a single female parent (Tsehay, 2007). Such households are called ‘female-headed’ households which consist of a woman living alone with/without her children or a woman living along with her spouse and children but with the major economic role in the household (Fuwa, 1999; Chant, 2007).

The ambiguity in defining the term “head” when left to the judgment of the family members, and the various implicit meanings loaded in the term (head) resulted in a lesser consensus on the situation when a female is regarded as head of household and the household is female-headed household (FHH). Fuwa (1999) gives three broad categories of FHH definitions: self-reported, demographic, and economic. The self-reported category is often created based on respondents statements in surveys and censuses, although there is no precise definition. Demographic definitions take account of FHHs where the female head is separated, divorced, widowed or single. This category also considers households where there is a male partner but not present temporarily as FHHs. The other aspect of demographic classification of households can be done in terms of *de facto* and *de jure* FHHs. *De facto* FHHs are those households where the self-reported male head is absent during majority of the time. *De jure* female-headed households are those usually headed by widows or unmarried, divorced or separated women. Thirdly, FHHs may be defined depending on the level of economic contribution of females to the household. This final categorization implies defining headship in terms of the largest cash earner in the household. According to Fuwa (1999) defining a female member, usually a mother, as the head of a household if she is the bread winner of the family is the suggested way.

In the countries we chose in particular or the DHS in general head of a household is defined as the person who is considered responsible for the household. The head is appointed by the respondent at the survey and s/he may be chosen because s/he is the sole bread winner, the eldest or for some other reason. The propensity for women to perceive or report themselves as the household head, especially if an adult male lives in the household, varies across cultures. In traditional communities, as those in SSA, it is customary to report a

male (husband) partner as the head of the household if he lives with, or is attached to, the family, i.e. if he is not died or divorced. Thus most of the times a self-reported female household head appears to be a de-jure FHH (Batana, 2013)

2.1.1.2. Causes of female headship

Factors responsible for the global incidences and increase (in number) of female-household headship are diverse and differ from region to region and from a country to another. In general, post-war economic restructuring and the focus on industrialization, especially in contemporary developing countries, have led to rural-urban labor migration which changed the sex ratios in both rural and urban areas, as a result of this relocation more FHHs are found to exist in cities. This is because the newly opened job opportunities in the urban factories require lower labor but skill which women are regarded good at. Thus higher employment rate attracts the women in the rural part to come and live in urban areas usually alone, or with their kids but as the principal of the household (Chant and Brydon, 1998). Through years with this higher inhabitation of females to the urban areas and leading their settled life with their family started to increase the formation of FHHs as a new family structure and composition.

In Africa greater numbers of single female migrants to cities are resulted due to frequent guerilla wars and the death of male combatants in rural areas (Chant, 2003). Thus women household headship happens to be common in cities despite the fact that poverty in these urban areas appear to be dominant than their rural homesteads where they can cultivate and support themselves. In addition to the war that affects the whole society, lawlessness and the associated violence against women in the countryside is another factor for migration of women to cities of Africa (Moser and Rodgers, 2005). Sometimes, the growth in proportion of FHHs in Africa is closely linked to poverty whereby the inability of men to satisfy household needs and deepened financial stress which leads to forced male labor migration or family disruption and divorce (Kabeer, 2003).

In addition to the aforementioned reasons for the formation and increasing percentage of FHHs, in specific circumstances, women in a household who seek for autonomy and class, may decide to make a deliberate action to be independent, which is to get divorced.

According to Chant and Brydon (1989), FHHs in Latin America, specifically in Mexico, are formed as a deliberate strategy on the part of women to escape the financial and emotional insecurity resulting from co-residence with an irresponsible partner. For example in some African towns, such as Abidjan in the Ivory Coast, women positively resist living with their partners for fear of being economically constrained (Moser and Rogers, 2005).

2.1.2. Poverty: Concepts and Definitions

The variation in extent, its multi-dimensional nature and other related factors, resulted in a difficulty in getting a single and straight forward definition for poverty. Thus different authors and institutions are forwarding different definitions for poverty according to their context. Some argue that income alone can adequately describe human welfare, because incomes of an individual are objective, unbiased and can be adjusted to offset differences between inter and intra-household inequalities (Ravallion, 2011). But many others do not agree with such simplification of poverty and they argue that using income measures only one aspect of deprivation ‘the command over commodities’ and overlooks other dimension or aspects of wellbeing. For example, from an urban context, an income approach can underestimate urban poverty because it does not capture other dimensions of urban livelihood and poverty associated with cost of living, access to productive public services, vulnerability to macroeconomic fluctuations and environmental health hazards, and erosion of kin-based safety nets that commonly exist in the traditional rural population (Tacoli, 2012).

One of the known personalities who does not accept income as a sufficient indicator of poverty is Amartya Sen, whose works underpin the concept and measures of multidimensional poverty. He stated that human lives are battered and diminished in all kinds of different ways, and the first task in measuring wellbeing is to acknowledge that deprivations of very different kinds have to be accommodated within a general overarching framework (Sen, 2004). Thus for Sen, poverty has to be seen as the deprivation of basic

capabilities¹ rather than merely as lowness of incomes. He further elaborated his argument that the perspective of deprivation of capabilities does not involve any rejection of the utilitarian view that low income is clearly one of the major causes of poverty, since lack of income can be a principal reason for a person's capability deprivation (Sen, 1999).

In most of recent economics literature poverty is recognized to be multi-dimensional in its causes and manifestations. The deprivations households are facing include lack of income and productive resources sufficient to ensure a sustainable livelihood; hunger and malnutrition, ill health; limited or lack of access to education and other basic services; increasing morbidity and mortality from illness; homelessness and inadequate housing; unsafe environments; and social discrimination and exclusion; lack of participation in decision making and civil, social and cultural life. Therefore the analysis and measurement of poverty are now being conducted using the multidimensional approach (Ravallion, 2011; Batana, 2013; Alkire et al., 2015e).

2.1.2.1. Urban poverty

Conceptualizing urban poverty separately from the whole notion of poverty is noted by some authors to be problematic for couple of reasons. One of the reasons is the arbitrary definition of categories between rural and urban areas and the other is a dualistic spatial classification as rural and urban. These factors may have undesirable effect of restricting discussion about the structural causes or determinants of poverty and diverting attention of poverty reduction policies and programs from national and international level solutions to be area specific (Tsehay, 2007). There is, however, a need to recognize and understand the distinguishing features of urban poverty. Therefore the analysis, formulation and implementation of policies will be differentiated, for rural and urban, although policy coordination is needed.

As compared to rural poverty urban poverty, especially in developing countries, has peculiar and complex characteristics in terms of its incidence, economics, demography and politics (Desai, 2010). The urban poor are highly affected by, among others, persistent

¹Capability is combination of two words 'capa'city and 'ability'. And can be defined as **being able to** (live longer, be well-nourished, be healthy, and be literate).

price distortions and communal violence. They have inadequate provision and lower access to functioning services and infrastructure like school facilities and microfinance institutions. They are also challenged by inadequate protection of poorer groups' rights, feeling powerlessness, exclusion (via discrimination) and self-exclusion of potential social program beneficiaries. They live in inadequate shelter which is typically of poor quality, overcrowded and insecure (Mabogunje, 2005; Desai, 2010).

What makes a policy strike against these urban poverty problems a puzzle is, that they are highly interrelated to one another. Their occurrences have a negative response loop, where a bad story leads to a worse one. This in turn is attributed to (or leads to) the difficulty of identifying between the causes and the effect of a certain problem for sure. Generally speaking, since it is multi-dimensional in nature and have a joint distribution of the problems, an urban poverty research must take in to consideration quite a complex set of facts.

2.1.3. Measuring Poverty

There are number of reasons why we should measure poverty and measuring poverty helps to keep poor people on the agenda. This is done as it enables us to identify who are the poor and target, evaluate and monitor policy and institutional interventions geared towards the poor (World Bank, 2009). The way we measure poverty also importantly affects the way we understand poverty and create policies to influence it. This makes the reason why poverty measurement methodologies are of tremendous practical relevance. Given these and other factors we have different approaches to the measurement of poverty.

There are essentially two widely applied poverty measurement methods, the Direct (multidimensional) approach and the Indirect (unidimensional) approach. The direct method shows whether people satisfy a set of specified basic needs, rights, or functionings- in line with Sen's capability approach². The Indirect method, on the other hand, determines

²According to Sen's Capability approach, Functioning means being and doing; that means a person's achievement of what s/he wants to do or be. Functioning of a person may include, among others, being well fed, having part in the community, being sheltered, being related to other people, to be working in the labour market, and caring for (and being cared by) others and being healthy (Sen, 1984).

whether people's incomes (consumption) fall below the poverty line, the income (consumption) level at which some specified basic needs can be satisfied (Herrera, 2014).

Both methods have been extensively applied in the world of poverty analysis, but in recent years the multidimensional approach appear to be the most used. The second fact is credited for the availability of data, i.e. countries are conducting multi-topic household surveys, such as Demographic and Health Survey, which provide the required inputs for the construction of multidimensional measures. According to OPHI (2015), the number of countries have increased dramatically from the mid-1980s to around 130 developing countries on May 2015. This enabled the construction of both international multidimensional poverty measures (e.g. global MPI) and national MPIs (e.g. Mexico, Bhutan) (Alkire and Santos, 2010).The following is a discussion of the two approaches: what the approaches specifically are, how they are related, what the difference between them is, their advantage and limitations.

2.1.3.1. Unidimensional approach

Unidimensional methods are those applied when a well-defined single-dimensional resource or variable, such as income, consumption and/or expenditure is selected as a basis for the poverty measurement. The first step of the analysis, identification, in the indirect unidimensional evaluation starts by setting a poverty line corresponding to a minimum level below which a person or household is considered poor. And the second step, aggregation, is usually done through the use of a numerical poverty measure that determines the overall level of poverty given the poverty line (Foster, Greer and Thorbecke, 1984).

Unidimensional methods require a single dimensional variable and a single cutoff³ (about the poverty line), but places no a priori restrictions on how the resource variable has been constructed. The interpretation of the variable and its cutoff level is very different if total income or total expenditure is used, with the former reflecting 'what could be' and the latter reflecting 'what is'. The underlying principle of aggregation, however, is the same

³ As compared to the dual cutoff (about indicator deprivation and about the overall poverty) the multidimensional analysis follows

whichever resource is chosen: adding up monetary values to obtain a total resource level that can be compared to a monetary cutoff or what is called the poverty line (Alkire and Foster, 2011).

The worldwide used income poverty line⁴ was “dollar-a-day” or “extreme” poverty measure reported by the World Bank. Those individuals who fail to acquire this minimum amount of dollar in a day are deemed to be poor according to this approach. And the widely used poverty measures in this monetarist unidimensional approach were the class of decomposable poverty measures developed by Foster, Greer and Thorbecke (1984), also called FGT measures. Using the dollar a day poverty line, these measures incorporate both the level and depth of poverty for a given individual, household or population, which satisfy a range of poverty axioms and possess several desirable properties of a poverty measure such as decomposition and subgroup consistency.

The FGT index is defined as,

$$P_{\alpha} = \frac{1}{n} \sum_{i=1}^q \left(\frac{z - y_i}{z} \right)^{\alpha} \quad , \alpha \geq 0 \text{ for } y_i \leq z$$

Where P_{α} is a measure of poverty, z is the poverty line (in terms of income or consumption expenditure), n is total population, q is total number of poor households, and y is the total income or consumption expenditure. The poverty index, P_{α} , changes when α takes different values. This means, when α is 0, 1, and 2, P_{α} equals the head count index (P_0), the poverty gap index (P_1), and the poverty severity measure (P_2), respectively.

Despite its worldwide use, the traditional monetarist poverty measure has been increasingly challenged for not being good enough to measure the welfare of a society. This is because, due to externality and imperfect market, income or consumption may not precisely reveal what happened to the welfare of the society (Ravallion, 2011). This means that monetary poverty does not consider the goods and services which are part of welfare but which don't

⁴ This minimum threshold has been modified depending on the presence of data. It once was a single dollar per day and upgraded in Chen and Ravallion (2010) to be \$1.25/day and later \$1.90 in 2012 according to purchasing power parity.

have market prices or are related to non-market dimensions (for example, public services of health, education, safety net, environmental quality) that are, frequently, not provided through the market (Herrera, 2014).

Using the indirect method to study household level poverty provides no way to verify the intra-household distribution of income, this is because the approach assumes equity in the distribution of resources within a household. For example, Klasen and Wink (2003) found that there is evidence of an anti-female bias in some regions of countries they studied. This approach designates individuals in households whose incomes/expenditures are below the poverty line as poor even if the household as a whole is not poor if individuals are considered, on the other hand.

The international poverty comparison was the other aspect in which the monetarist income approach has been challenged. Leaving aside the challenges of data comparability, economists have recognized some basic limitations of the income method that makes it inapplicable to compare countries. First, the pattern of consumption behavior may not be uniform across countries, so attaining the poverty line level of income does not guarantee a person will meet his/her minimum needs. Second, people may face different prices, reducing the accuracy of the poverty line. Third, the ability to convert a given amount of income into certain functionings varies across age, gender, health, location, climate, and conditions such as disability, i.e. people's conversion factors differ. Fourth, participatory studies indicate that people who experience poverty describe their state as comprising other deprivations in addition to low income. Finally, from a conceptual point of view, income is a general purpose means to valuable ends. Thus, important as income is, measurement exercises should not ignore the space of valuable ends (Sen, 1979; Alkire and Santos, 2010).

Challenges to the traditional unidimensional monetarist approach continued as high profile initiatives, such as the Stiglitz-Sen-Fitoussi Commission⁵, called for broader measures that

⁵The Stiglitz-Sen-Fitoussi Commission, named after the surnames of its leaders, is a commission of inquiry created by the French Government in 2008. The inquiry examined how the wealth and

take account of other vitally important aspects of life. The human development approach, suggested by this commission, argued that although income is important, it needs to be complemented by more direct measures. Ending \$1.25/day poverty is unlikely to mean the end of the many overlapping disadvantages faced by people living in poverty, including malnutrition, poor sanitation, a lack of electricity, or inadequate schools (Alkire and Sumner, 2013). So tackling other aspects of poverty requires additional policies and investments, and measures that incentivize and monitor progress on them (Alkire and Santos, 2010).

New welfare approaches started defining poverty not as the possibility of obtaining results (focusing on the resources available) but as the deprivation of capabilities and functionings (having good health, education, safety, decent employment, etc.) (Sen, 1979). And new poverty reduction programs focused on results (conditional cash transfer depending on education, health, etc.). Thus the targeting, monitoring and evaluation of these programs need indicators covering these dimensions (Herrera, 2014). These and other factors necessitated a need for a newer approach to define and measure poverty, a multidimensional approach.

2.1.3.2. Multidimensional Methods

After the seminal works of Amartya Sen on poverty, famines, entitlements and deprivations (Sen, 1976; 1981; 1985) an extensive debate on the concept of poverty measurement was raised and various approaches and indices to capture poverty, including multidimensional approach, were developed. Most of these documents were on agreement about the fact that poverty encompasses deprivations in a wide variety of dimensions, therefore it appears unsatisfying to use only income and/or consumption as a proxy to analyze poverty. Besides applying unidimensional methods to an aggregate composite indicator for the multiple aspects, which includes both ordinal and cardinal dimensions, suggests that the presence or the extent of shortfalls in component variables (i.e. dimensions or indicators) are of no particular concern, and thus do not independently affect whether a person is poor, or the

social progress of a nation could be measured, without relying on the uni-directional gross domestic product (GDP) measure.

overall level of poverty (Alkire and Santos, 2010). For these reasons it may made sense to explore alternative measures that can complement unidimensional methods.

In the last decade of the 20th and the first decade of the 21st centuries the literature on multidimensional poverty measurement blossomed in a number of different directions⁶. But much of the research in this area has been concerned with finding an appropriate poverty measure, rather than devising new methods of identifying the poor (Alkire and Foster, 2011). It was in 2003 two signal articles, that go beyond poverty measures and seek for answer for how the multidimensional poor should be identified, were published.

The first one was by Bourguignon and Satya (2003). This paper proposed a class of multidimensional poverty measures that extended the Foster Greer and Thorbecke (FGT) class of indices and discussed interrelationships among dimensions. Bourguignon and Satya's (2003) discussion of identification of the poor is concerned with general forms of identification functions and their context assumed that tradeoffs are being made between continuous dimensional variables. They proposed the use of dimension-specific lines (which are called deprivation cutoffs in Alkire and Foster (2007, 2011a)) as the basis for determining who is deprived and in which dimension. They then posit the existence of a general identification function, which determines whether a person is deprived enough to be called poor, and a poverty measure that evaluates how much is the overall poverty. Axioms analogous to the ones used in the unidimensional case ensure that the measure they proposed properly reflects poverty and that it can be decomposed by subgroup. The axioms also ensure that the poverty measure is consistent with the identification function.

The second paper, authored by Atkinson (2003) linked the emerging axiomatic literature on multidimensional poverty measures to the 'counting' literature that had been implemented in Europe and urged that counting measures to be connected more with welfare economics. Atkinson discussed two benchmark identification approaches, the union and intersection approaches. Under union identification, a person who is deprived in

⁶ Example papers mentioned in Alkire and Foster (2011) were; Anand and Sen (1997), Brandolini and D'Alessio (1998), Chakravarty et al (1998), Tsui (2002), Deutsch and Silber (2005), Duclos, Sahn and Younger (2006), Chakravarty and D'Ambrosio (2006), Kakwani and Silber (2008) and Thorbecke (2008)

any dimension is considered poor. Whereas according to the intersection identification approach only persons who are deprived in all dimensions are considered poor. Both approaches appear easily understandable and have useful characteristics, such as being able to be applied to ordinal variables. However, they can be particularly ineffective at separating the poor from the non-poor and may mislead conclusions. In a study made by Alkire and Seth (2009; cited in Alkire and Foster, 2011b), which used ten dimensions to identify the poor in India, the union approach identified 97 percent of the population as poor, whereas the intersection approach identifies one-tenth of 1 percent (0.01%) to be poor.

According to Alkire and Foster (2011b), one important omission in this literature is a proper discussion of the axiomatic structure for identification functions (or, more generally, for overall methodologies) that could help guide the construction of new identification techniques. They added that too little attention has also been paid to developing practical alternatives to the union, intersection, and unidimensional identification approaches. This was a key motivation behind Alkire and Foster's (2007, 2011a) "counting and multidimensional poverty measures", also known as the Alkire-Foster (AF) methodology. This new methodology for measuring poverty, in adherence to Sen (1976), first identifies who is poor then aggregates to obtain overall measures of poverty that reflect the multiple deprivations experienced by the poor.

2.1.3.3. Alkire Foster (AF) methodology

The Alkire Foster method of Multidimensional poverty measurement was developed at Oxford Poverty and Human Development Initiative (OPHI) by Sabina Alkire and Professor James Foster since 2007. In addition to be compatible with the standard conceptual framework proposed by Sen (1976) for measuring poverty, in the sense that it first identifies who is poor, then aggregates to obtain overall measures of poverty that reflect the multiple deprivations experienced by the poor, the methodology satisfies a set of basic axioms for multidimensional poverty measurement.

The AF methodology of multidimensional poverty measurement creates a class of measures that both draws on the counting approach, which identifies the poor according to

the number (count) of deprivations they experience, and extends the Foster, Greer and Thorbecke (FGT) class of decomposable poverty measurement, what is arguably the most popular class of unidimensional poverty measures employed in the literature, (Alkire et al., 2015e).

Having identified who is poor, the AF method aggregates the information on the poor and generates a unique class of poverty measures (M_α) that goes beyond the simple headcount ratio⁷. Three measures in this class, depending on the value of α (a parameter reflecting society's aversion to poverty), are of greater importance. The first member of this family of multidimensional poverty measurement is the so called *Adjusted Headcount Ratio* (M_0), otherwise known as the MPI, when the value of α equals 0. 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), i.e. $M_0 = H \times A$. This variety of the AF methodology can be calculated with both cardinal (e.g. income) and ordinal (e.g. sanitation), this makes the rationale behind its wide use in the multidimensional poverty literature (Alkire et al., 2015b). The other two members M_1 and M_2 can be calculated with only cardinal dimensions. These two are not dealt with here because we don't use them in our study.

This methodology is a flexible technique that can incorporate several different 'dimensions' of poverty or wellbeing, according to the context, to create measures that complement income poverty indices. Besides it is perhaps best seen as a general framework for measuring multidimensional poverty since many key decisions are left to the user. These include the selection of dimensions, dimensional cutoffs, dimensional weights, and a poverty cutoff (Alkire and Foster, 2011b). Given these features of the AF methodology it has been continually used to analyze multidimensional poverty in the world.

A poverty measure that is to be selected from a wide range of options should be checked how it behaves to different situations, so that it will be a good measure of poverty and

⁷In the traditional headcount ratio the measure of poverty is expressed as the ratio of the number of poor to the whole population ($h = \frac{p}{n}$).

supports policy goals (Alkire et al, 2015e). In the literature of multidimensional poverty analysis Sen (1976) formally introduced the term axiom- to refer to the desirable properties that a measure (or family of measures) should follow. And those methods which came up with measures having this character are termed axiomatic approaches.

The Alkire Foster methodology is a typical example for axiomatic measures. One can decompose M_0 by population sub-group, to show how each of these varies by region, by ethnicity, by rural and urban areas, or other subgroups for which the sample is representative (Alkire et al, 2015b).

2.2. Empirical literature

The search for empirical literature for this research is challenged by the fact that the study covers multiple issues (urban, multidimensional and gender dimensions of poverty) and multiple countries from SSA. Up to our best expedition in the literature we could not find papers that address the issues we are dealing with simultaneously. Most of the studies are done about single country and they focus on the rural women. In those researches that included urban areas the gender of the household head is considered as one demographic predictor of the poverty status in a household. Studies that measure the effect of other factors on the multidimensional poverty status of FHHs and compare these effects with that on MHHs are of rare availability. Therefore in the subsequent paragraphs we tried to customize the existing literature to our objectives. The first section of the literature we review is those researches done on the poverty and women. In the second section we review those researches on determinants of poverty.

2.2.1. Feminization of poverty

Since the 1990s many studies concerned with the idea of feminization of poverty have been done in many different nations, disciplines, methodologies, etc. As far as the methodology is concerned, larger part of the literature accepted female-headed households as a proxy to measure the level of welfare and poverty of women. Much research in low-income urban communities has identified female-headed households as more vulnerable economically than male-headed households, that is, a higher proportion are in lower standard of living

and/or have less secure incomes and other resources required for a pleasant life. Thus the studies use the relative vulnerability of FHHs to measure the poverty among women. However it is not of universal consensus to use this method. There are lines of arguments for the departure from the utilization of FHHs for the study of feminization of poverty and for the emphasis on studying individual women.

One of these arguments states that measures of poverty “among female” and “among female-headed households” are not indicators of the same phenomenon. Even though both capture a gender dimension of poverty they do in distinct ways. They differ by the unit of identification they consider and by the population included in each group, and obviously have different meanings. Headship-based indicators are intended to represent what happens to specific vulnerable groups and their families, therefore their unit of analysis (identification) is the household and the population considered includes both men and women living in these households, but excludes women and men living in other household formations (Afriyie and Amposah, 2014; Vijay, Lahoti and Swaminthan, 2014). On the other hand, Indicators of poverty among females make a complete separation of men and women as individuals, and this enables the examination of intra household gender poverty in addition to considering all females in the study area (wikigender).

The second argument is that even though most of female-headed households experience a higher level of poverty and have a higher rate of vulnerability to poverty, it would not be correct to state that all female-headed households are poor. One of the reasons is the fact that the proportion of female heads working compared to the overall female work participation rates is higher, since in most cases the female head is the active earner of the family (Rustagi, 2006). In terms of economic wellbeing more in-depth research, such as Chant (1997, 1998), has showed that because of factors such as the contributions from children and the different distribution and use of resources (e.g. consumption smoothing) within the household, female-headed households are not necessarily worse off. Following these arguments some researchers studied individual women to see the status of feminization of poverty.

Kodama (2006) studied feminization of non-monetary aspect of poverty in Ethiopia. The paper used body mass index (BMI) to analyze poverty-affected females in the Amhara

region of Ethiopia. BMI is chosen, Kodama argues, because it is one of the effective tools for measuring individual poverty level. Data used in this study was mainly from the Ethiopian Demographic Health Survey (DHS) carried out in 2000 by the Central Statistical Authority (CSA) of Ethiopia. This paper used data from the Amhara region covering 1,407 females between 15 and 49 years of age, including 211 female household heads and 1,196 married females. The results of the BMI analysis show that the most poverty-affected female group is the female household heads in urban areas.

Another study is a paper by Hazel McFerson. McFerson (2010) studied Poverty among Women in Sub-Saharan Africa. The paper focused on the traditional restrictions on women property rights, weak governance and violent civil conflict in perpetuating gender discrimination as major causal factors of poverty among rural women in Sub-Saharan Africa countries of the tropical belt. The paper stated that unlike the rest of the world all these three factors are existing simultaneously in contemporary Africa and their interaction is severely affecting the livelihood of the women in the area. The paper also compared statistical evidences about different human development indicators for women from forty six African countries for the years 1994 and 2005. The study concluded that poverty among women is sever specially in four dimensions of lack of asset, lack of income, lack of opportunities and lack of access.

Another study from a multidimensional perspective is Batana (2013). In this paper the author measured multidimensional poverty among women in fourteen SSA countries. The study analyzed women of reproductive age (15 - 49) about whom data was obtained from DHSs conducted in each country within three years before the study. The Alkire Foster multidimensional poverty approach was applied with customization of the indicators and cutoffs to the study context. This study used the usual three dimensions of asset, schooling and nutrition and one uncommon dimension empowerment to measure the state of multidimensional poverty in the studied women. The estimations made resulted in that women are multidimensionally disadvantaged. And the dimensions schooling and asset possessions are the main contributors to their problematic livelihood.

But most of the studies on feminization of poverty studied the status of FHHs. There is, however, difference within these studies too. Higher portion of them regard the gender of

household head (GHH) as one of the demographic factors that determine the level of household poverty. Thus they use the GHH as one of the explanatory variables in their regression analyses and interpret for the sign of the coefficient on the GHH.

Adeoti (2014) studied the trend in and determinants of multidimensional poverty. The study focused on the trend and determinants of household level multidimensional poverty in rural Nigeria in the years 2004 and 2010. The study applied the Alkire Foster methodology with five dimensions and fifteen indicators. FHH were studied as subgroup in the poverty analysis and found to be multidimensionally poorer than their MHH counterparts during both years with an increasing trend. In the multivariate analysis that made use of binary logistic regression the GHH was regarded as one demographic predictor of poverty. The regression analysis results showed that FHHs have higher probability of being multidimensionally poor than MHHs.

Another paper is by Habyarimana, Zewotir and Ramroop (2015). This study analyzed the DHS in Rwanda to measure poverty. They used the Principal Component Analysis (PCA) to create an asset index. The asset index is used to identify the poor and nonpoor. They applied a binary logistic regression to check the determinants of poverty. Their analysis found that gender, education, occupation and age of the household head and household size are predictors of poverty status of a household. And the sign of these predictors is in line with the literature, in that being female-headed increases the probability of a household becoming poor.

2.2.2. Determinants of poverty

Feminization of poverty does not necessarily mean female household headship leads to poverty. It rather means, as we saw in the introduction, FHHs are poorer than MHHs, the effect of poverty and factors behind poverty is different for the two male-headed and female-headed family structures. Therefore we need to have analysis that considers FHHs and MHHs separately. Some studies did so and found that FHHs are poorer than their MHH counterparts. The studies also observed that the effect of some demographic and socioeconomic factors is biased against the FHHs. The following are some exemplary papers, and the first two studied entirely FHHs and the rest compared them with MHH.

Berhanu (2011) studied the incidence of urban poverty in female-headed Households in Addis Ababa, Ethiopia. The study made use of primary data collected by the researcher and used both qualitative and quantitative data analysis methodology to assess the incidence of poverty in Addis Ababa. The research found that the prevalence rate of poverty among FHHs is high (73%) with a poverty gap of 20 percent. The paper had one step ahead in considering the multidimensional aspects of welfare, though not its explicit intension. It tried to analyze the educational status of the heads, migration, access to financial services, participation in social institutions, etc. But this study could have done more using regression analysis to test the exact contribution of these factors and their statistical significance.

Sekhamu (2012) studied socioeconomic and demographic determinants of poverty among FHHs in a South African town. The study identified the poor households using the World Bank Household Level Subsistence income, calculated as sum of all the income members of the household earn. Applying logistic regression the study examined the association of the household poverty status with a set of socioeconomic and demographic predictors. Findings of the research showed that household size, employment status and age of the female household head have significant effect on the poverty status of the FHHs studied.

Meron (2003) examined the extent of poverty and vulnerability of female-headed households to poverty by comparing these households with their male-headed counterparts in urban Ethiopia. This study also looked at the determinants of their welfare and poverty. Using the data from the 1999/2000 Ethiopian Household Income, Consumption and Expenditure Survey (HICES) and Welfare Monitoring Survey (WMS) from Central Statistical Authority (CSA) the paper applied the Foster, Greer and Thorbecke (FGT) poverty indices, descriptive analysis of poverty indices and micro level regressions to achieve the objective. One advantage in this paper was it had a multivariate regression analysis using binomial probit model to test the effect and significance of other socio economic and demographic factors on the two household structures. The paper revealed that female-headed households are poorer and more vulnerable to poverty than male-headed households. But this is not due to the gender of the head, according to the paper, rather other factors played the role. Educational attainment of the head, household size

(especially higher number of children in a family), location of residence in the region, and to some extent employment status of the head are found to be the key determinants of poverty.

Takane (2007) studied FHHs from six villages in Malawi and found that they are highly disadvantaged as compared to MHHs. The paper applied descriptive analysis to compare the characteristics of the two family structures. The study has also examined the difference between different categories of FHHs. Those categories of FHHs who have non-farm income, labor and income opportunities from social networks happened to be better-off than those who have not.

Jayamohan and Amenu (2014), on their research titled Gender and poverty – an analysis of urban poverty in Ethiopia, analyzed gender aspects of urban poverty in Ethiopia using Secondary data from the 1999/2000 and 2004/2005 Household Income Consumption and Expenditure Survey (HICES) and Welfare Monitoring Survey from the Central Statistical Authority (CSA) of Ethiopia. Applying the FGT index and regression models, such as Ordinary Least Squares, Probit and Quantile models, this study found that Feminization of poverty is a weak argument in urban Ethiopia because between 1999/2000 and 2004/2005, the poverty headcount has decreased for both female-headed households and male-headed households, and the rate of reduction was higher for the FHHs. However, over the two periods the income shortfall below the poverty line and severity of poverty were more common in households headed by females. This study had also assessed the determinants of poverty in the two household structures and found that there were gender poverty differences in terms of location, and educational level of household head.

The above studies on determinants of poverty are done about one country and some, even, about a specific town. To have a broader understanding of the state of feminization of poverty it would have been better if they considered a wider region of Africa- or at least SSA. The development literature contains some studies that cover a wider area of SSA. The following are just to present how these studies could be done.

Adeyemi, Ijaiya and Raheem (2009) studied the relative contributions of selected micro and macroeconomic variables to the observed level of poverty in Sub-Saharan Africa. The

paper used cross country data from forty eight countries for the year 2003 from three different but related sources. The authors selected per capita household consumption expenditure in each country to be their measure for the poverty status of households. The independent factors selected as determinants of poverty were country level micro and macro variables. The study applied multiple linear regression model with the log of household consumption expenditures as dependent variable to be explained by the variables they proposed to have effect on poverty. The study found that along with others gender discrimination against women has a negative effect on the livelihood of the population, to which women are part.

Prince (2014) studied macro level determinants of multidimensional poverty in SSA. This study used the Human Poverty Index (HPI) and per capita household consumption expenditure of 47 SSA countries as variables that indicate the wellbeing of the population in the region. It tested the effect of policies and activities that aim at improving economic growth and capabilities, related to literacy, health and empowerment, on the dependent variables. The study found that growth in GDP per capita has a positive and significant relationship with poverty reduction. The capability based policies has no significant effect on household consumption expenditure. But these policies about health, education, health, women empowerment and productivity have a significant effect on reduction of multidimensional poverty as measured by the HPI.

As observed from the review of literature we made, the analysis of feminization of poverty can be seen from different perspectives and approaches. Some of the studies used the misleading unidimensional approach, given our discussion in section 2.1.2.2. By applying regression in this framework these studies considered some basic aspects of wellbeing as exogenous to the poverty status of households. Because education and health are examined as causes of poverty in the monetarist unidimensional approach.

The other part of the literature applied multidimensional methodology. Such studies have a closer look and provide a good appreciation of feminization of poverty as compared to the above studies. In contrary to the monetarist approach this methodology recognizes health, education and living standard variables as manifestations (or dimensions) of

poverty than factors leading to poverty. This leaves a place for the examination of the socio-economic and demographic factors behind the households' multidimensional poverty.

Taking a wider study area is intuitively better for a broader understanding. Thus studies that are done using multiple countries data would be more indicative about the status of feminization of poverty in SSA. They better consider households from multiple countries than country averages because poverty is borne by individuals or households. Analyzing data about individuals and/or households from multiple countries and checking the impact of between country differences and within country similarities lack the literature on feminization of poverty generally, or in SSA specifically.

Therefore in this thesis we tried to contribute to the existing stock of knowledge on feminization of poverty in SSA by filling the gaps we discussed above. The contributions made can be summarized as; the study of the issue using multiple country data, analyzing poverty from multidimensional perspective, testing the effect of some socioeconomic and demographic factors on the probability of household to be multidimensionally poor. Unlike the rest of the literature this paper simultaneously considered household and country level variables in the regression analysis. And we made comparisons between female-headed households and male-headed households in terms of the incidence, intensity and determinants of multidimensional poverty.

CHAPTER THREE

METHODOLOGY OF THE STUDY

3.1. Data and Sources

For a cross-country analysis data comparability is particularly important (Jenkins and Bryan, 2013). This is because the credibility of the empirical results depends crucially on the availability of a database with health, education and living standard indicators collected using common methodology. One of the sources for such data is the Demographic and Health Survey (DHS). Demographic and Health Surveys (DHSs) are nationally representative household surveys that have been conducted in more than 85 countries worldwide since the middle 1980s (Subramanian, et al. 2012).

The DHS collects a wide range of objective and self-reported data on indicators of health, education, household living standards and non-material demographic and socio-economic characteristics of the respondents using three questionnaires: a household questionnaire, a women's questionnaire and a men's questionnaire. Therefore we found the information we needed for the indicators of multidimensional poverty and for the supposed household level determinants of poverty from the DHS dataset we obtained from the ICF DHS program database.

A key advantage of the DHS over other sources was that the same methodology is adopted in all countries, allowing comparisons between countries. Other advantages of the DHS include high response rates, national coverage, high quality interviewer training, standardized data collection procedures across countries and consistent content over time, allowing comparability across populations cross-sectional and over time (Subramanian, et al. 2012).

We have used another secondary source for macro or national level variables, about which the DHS does not collect information. The data for these entries was taken from the World Development Indicators data by the World Bank, released on 23, March 2017. We chose

this dataset from the rest available sources because it is the primary World Bank database for development data from officially-recognized international sources.

The DHS usually takes place in five years interval. This made the possibility of getting many SSA countries conducting the survey during the same year implausible. Accordingly, for this research, we have chosen four SSA countries based on the availability of data. These countries, namely Ghana, Lesotho, Malawi and Rwanda, are chosen because they conducted their very recent DHS in the same year of 2014.

Technically speaking we have used some sort of stratified cluster sampling. It was clustered because from the total SSA countries conducting DHSs we have chosen four, as clusters into which households are nested. And it was stratified, as discussed in the next paragraph, the sample households were proportionally representative to the entire urban households in the selected four countries. The demographic and health surveys used a two-stage sampling in every country. The first stage was the choice of enumeration areas. The second stage involves selecting households from the enumeration areas (NISR et al., 2015; GHSS, GHS and ICF, 2015; MoH Lesotho and ICF, 2016). From the enumeration areas we selected the urban part and from the selected enumeration areas we took sample households based on data availability.

In choosing the sample households for this paper we had to follow two facts, and we did follow. The first one was the percentage share of the two family structures in each respective country. The percentage of FHH in the countries we chose was almost the same (31 – 35%) in 2014. So following this we made the percentage of FHH in the sample we selected 33 percent. The second consideration came from the model we chose for our regression analysis. According to Jenkins and Bryan (2013) in using multilevel modeling if the target level is households (or level one) then the number of the households chosen should be way higher than the number of countries so that we can get good estimates of the parameters. Therefore after cleaning the data based on relevant variables this study used, we have selected 3,609 households from the four countries.

Table 3.1. Sample households by country and gender of household head.

Country	FHH	MHH	Total
Ghana	598	1324	1922
Lesotho	97	223	320
Malawi	257	526	783
Rwanda	267	317	584
Total	1219	2390	3609

Source: ICF database, 2016

3.2. Poverty Analysis

From the multidimensional poverty measurements discussed in section 2.1.3.2., in this study we used the Alkire Foster (AF) family of poverty measures, specifically the adjusted headcount ratio (M_0), to analyze poverty. This AF methodology was chosen for a couple of reasons. First, technically it accords to a number of desirable properties of multidimensional poverty measures and practically the AF family of measures uses the intuitive counting approach to identify the poor, and explicitly considers the joint distribution of deprivations both during identification and aggregation stages (Alkire et al 2015d). Second the (M_0) of this family selected for our purpose and its consistent partial indices (H & A) are intuitive and they are particularly applicable for both ordinal and/or cardinal data rigorously (Alkire et al, 2015c). The applicability of M_0 with ordinal variables makes it handy when poverty is viewed from the capability perspective since many key functionings are commonly measured using ordinal variables. These technical and practical advantages of M_0 make it a particularly attractive option to inform formulation and monitoring of public policy.

Besides, the AF methodology is considered to be a general framework which allows us to adopt it, using indicators and weights that make sense in the context of our study, to create tailored poverty measures that are specific to the purpose we intend (Alkire et al, 2015b). Having indicators and cutoffs that are context and area (country) specific is very important for policy interventions. This is because the indicator, which is important for one area to differentiate poor and non-poor, is not equally important in another region.

3.2.1 Poverty measurement: the adjusted headcount ratio

The adjusted headcount ratio used in this study was calculated according to the framework discussed in Alkire et al. (2015e, 2015c, 2015b). The study considered ' n ' households from urban areas of four SSA countries. We analyzed these n households for ' d ' number of dimensions of wellbeing or poverty. To do this we first formed an $n \times d$ achievement matrix ' Y ', where the rows represented the n households and the columns represented d dimensions. A specific entry $Y_{ij} \geq 0$ is the achievement of household $i = 1, 2, \dots, n$ in wellbeing indicator $j = 1, 2, \dots, d$. And a row vector $|Z_j| > 0$ was formed whose entries are the indicators' deprivation cutoffs, below which a household was considered deprived in indicator j .

By applying the deprivation cutoffs to the achievement matrix Y , we constructed an $n \times d$ deprivation matrix ' g ' replacing each entry in Y that was below its respective deprivation cutoff Z_j with 1 and each entry that was not below its deprivation cutoff with 0. This is called the first censoring, because the achievements above their corresponding deprivation cutoff were converted into 0. The deprivation matrix provides a snapshot of who is deprived in which dimension.

The next step was to assign weights for each dimension and indicator to decide the relative importance of the different deprivations. A row vector $|w| = (w_1 \dots w_d)$ of weights or deprivation values was used to indicate the relative importance of the different deprivations, and these weights are summed up to one $\sum_1^d w_i = 1$. Then an overall deprivation score ' C ', whose value lies between 0 and 1, was computed for each household by summing the deprivation gap of all d indicators multiplied by their corresponding weights, such that $C_i = \sum_{j=1}^d w_j g_{ij}$. This gave a column vector ' C ' that summarizes the deprivation scores of all n households.

$\sum_{i=1}^n c_i(k) / q$. Thus the adjusted headcount ratio we used in this paper to measure poverty can be written as follows

$$M_0(X; z) = \mu(c(k)) = H \times A = \frac{q}{n} \times \frac{1}{q} \sum_{i=1}^q c_i(k) = \frac{1}{n} \sum_{i=1}^n c_i(k)$$

$$= \frac{1}{n} \sum_{i=1}^n \sum_{j=1}^d w_j g_{ij} \dots \dots \dots (3.2)$$

For this research we have two subgroups that are mutually exclusive, female-headed households (n_f) and male-headed households (n_m) and the sum of these two subgroups equals the total number of households (n). And if we divide the achievement matrix Y in to two sub groups Y_f and Y_m that contains only female-headed and only male-headed households, respectively, then the overall M_0 can be written as:

$$M_0 = \frac{n_f M_0(Y_f)}{n} + \frac{n_m M_0(Y_m)}{n} \dots \dots \dots (3.3)$$

And the contribution of female-headed households to overall poverty (C_f) was calculated as:

$$C_f = \frac{n_f M_0(Y_f)}{n M_0(Y)} \dots \dots \dots (3.4a)$$

Whereas the contribution of male-headed households to overall poverty (C_m) was calculated as:

$$C_m = \frac{n_m M_0(Y_m)}{n M_0(Y)} \dots \dots \dots (3.4b)$$

We have also decomposed the overall poverty in to the contribution by the dimensions (or specifically by the indicators) considered. This decomposition was based on what is called censored headcount (CH), the headcount for each indicator after censoring those who are non-poor to zero and the raw headcount (H), which is the headcount for each indicator without censoring those who are poor to zero. In Andualem (2016) the censored headcount for indicator j is defined as $CH_j = \sum_{i=1}^n g_{ij}(c_i > k)$, and the contribution of each indicator computed as:

$$H_j = \sum_{i=1}^n g_{ij} \dots \dots \dots (3.5)$$

3.2.2. Unit of identification, dimensions, indicators, weights and cutoffs

The unit of identification/analysis used in this research was household and the households assessed include both male-headed and female-headed households. The selection of a household for the multidimensional poverty analysis implies that the deprivations are simultaneously experienced by all household members rather than isolated individuals, or literally it is families as a whole and not isolated individuals which are affected by and respond to difficult situations. For instance, if child education was a deprivation we assumed that this deprivation impacts not only upon the child who was out of school, but also to the whole household. This means that all other individuals living in this household are considered deprived with respect to this dimension (child education).

As far as dimensions and indicators are concerned, we used the dimensions and indicators that are frequently used in the literature of multidimensional poverty analysis for developing countries. Therefore the three dimensions and the ten indicators used in Alkire and Santos (2013) and OPHI (2016) were adopted with small modification. The slight modification was made on one living standard indicator, and on the cutoff of one education indicator. The one done on the living standard indicator was broadening the flooring indicator used in Global MPI (2016) to consider the roof and the wall of a dwelling, thus changed it to housing condition. The change in the cutoff (if it is a change at all), was for the years of schooling indicator of education dimension. Here we have modified the 10 years of age, at which a member of the household should finish the 5th grade, to 12 years. Because based on the official school age of the countries we studied one can reach the fifth grade at a minimum of 12 years, since s/he starts the formal education of grade one at seven years of age. The dimensions, indicators and cutoffs (both deprivation and poverty cutoffs) were directly as used in Alkire and Santos (2013) and OPHI (2016) except for the aforementioned modifications. Regarding the weights, all dimensions and each indicator within a dimension are equally valued, thus assigned the same weight. The table 3.2 on the next page summarizes the dimensions, indicators with their relative weights and deprivation cutoffs we used in this study.

Table 3.2. Dimensions, indicators, weights and deprivation cutoffs used in the study

Dimensions	Indicators (weights)	Deprivation cutoffs
Education	Years of Schooling (1/6)	No household member aged 12 years or older has completed five years of schooling.
	Child school attendance (1/6)	Any school-aged child is not attending school up to the age at which s/he would complete class 8.
Health	Child Mortality (1/6)	Any child has died in the family in the five-year period preceding the survey
	Nutrition (1/6)	Any adult under 59 years of age, or any child for whom there is nutritional information is undernourished in terms of height for age
Living standard	Electricity (1/16)	The household has no electricity
	Improved sanitation (1/16)	The household's sanitation facility is not improved (according to MDG guidelines), or it is improved but shared with other households
	Improved Drinking Water (1/16)	The household does not have access to improved drinking water (according to MDG guidelines)
	Housing conditions (1/16)	The household does not have adequate materials in two of: floor, wall and roof
	Cooking Fuel (1/16)	The household cooks with dung, wood or charcoal
	Asset ownership (1/16)	The household does not own at least one asset for easy mobility, one asset for access to information and one asset for livelihood

Source: Alkire and Santos (2013), with slight modification

Education

The argument that human capital (particularly education) is essential for economic growth is intuitively obvious. Expanding education has been recognized as the most important investment in human capital, among other human capital variables, for a long time. Human capital formation is not only valuable on its own but it is also instrumental to economic growth and poverty reduction, because education is a key determinant of individual opportunities, attitudes, and economic and social status (Andualem, 2016). Thus countries are striving to have expanded, of course with quality, coverage of education and achieving

universal primary education is the second goal of the MDGs and developing countries' primary goal.

As member of the United Nations, SSA countries have been working hard to achieve this MDG two of having all primary school aged children at school. Thus in this research we assumed households who are not reached with this goal of the governments and the universal community as deprived in the education dimension of wellbeing. To identify this we used two indicators with their respective cutoffs. The first indicator required at least one household member, twelve years or older, to have attended fifth grade. And the second indicator in this dimension required every primary school aged child in the household to be attending school. Households with no school aged child were regarded non-deprived in this indicator.

Health

Health is the other (in addition to education) important component of human capital, that really matters in the process of economic growth and development. There is a two-way relationship between health and economic development. One is that economic growth improves health, and the other improved health significantly enhances economic productivity and growth (Abebe, 2010). This makes health both the cause and result of economic advancement. This in turn leads countries to give due attention to the health status of their citizens, and to incorporate health related issues in their development agendas and micro and macroeconomic policies. Child mortality and nutrition were selected for the analysis of health related deprivations in this study. The first indicator, child mortality, most of the time is related to infectious diseases or diarrhea, which are easily preventable that implies the occurrence of such easily preventable mortality is uncountable deprivation. In this research, each household member was considered deprived if there has been observed, at least one, child death in the last five years before the survey. The second indicator required a well nourishment of the household. Adults were considered malnourished if their BMI was below 18.5 m/kg^2 . And children were considered malnourished if their z-score of height-for-age was below minus two standard deviations from the median of the reference population by the WHO standards.

Living standards

By the seventh goal of MDGs countries agreed to ensure environmental sustainability and have been exerting unprecedented efforts to the achievement of this goal. Environmental sustainability comprises progress in many factors, water, sanitation, forests, climate change among others, that affect the standard of living people are going through. According to Andualem (2016) the term standard of living expresses the quality of life which includes the availability of clean water, good waste disposal, good toilet services, fuel used for cooking and energy and clean and well-constructed housing. The presence or absence of one aspect of this living standard reinforces the availability or lack of another aspect(s) of this dimension.

For example, use of modern energy source like electricity has multiple effects in the livelihood of a household. Access to electric light by extending the day provides extra hours for reading and hence helps improve the school performance of children and for men and women working in and outside home extends working hours. Clean cook-stoves, that use electric power, can reduce fuel consumption and the negative health effects of dirty fuels, especially on women and children, from daily exposure to deadly cooking fumes (Mekonen, 2016).

To add another example access to water also has multiple effects in the household. Water is of multiple uses for drinking, cleaning or sanitation and a good access to clean or usable water for these purposes helps the health and productivity of the population. On health, access to clean water reduces the deaths from easily preventable diseases like diarrhea (what is regarded as one among the usual causes of child mortality). And from productivity point of view a lesser time to fetch water has an easily perceivable effect on the performance of home errands by women.

Thus having this significance of the living standard on the wellbeing of the population we chose six indicators to represent this dimension. The first indicator required the household to have access to electricity service. In relation to the second indicator, as per the MDG, a household is considered to have access to improved sanitation if it has some type of flush toilet or latrine, or ventilated improved pit or composting toilet, provided that they are not

shared. According to the third living standard indicator in this research a household is said to have access to clean drinking water if the water source was any of the following types: piped water, public tap, borehole or pump, protected well, protected spring or rainwater and it was within a distance of thirty minutes' walk (roundtrip).

The fourth indicator of the living standard dimension considered the housing condition of the household. The cutoff for this indicator checked if the household didn't have adequate materials for floor, wall and roof. What are the adequate materials for each part of the house considered are decided based on the DHS reports and survey questionnaires. If the house has earth/sand or dung floor material it was regarded as having inadequate flooring, if the house does not have finished roofing (corrugated iron/metal, wood, asbestos/cement fiber, cement/concrete, roofing shingles, or something better) the roof was not adequate. The wall was classified as improved if it was finished and made of cement, stone with lime/cement bricks, cement blocks, covered adobe, wood planks/shingles. Therefore for this indicator a household was regarded as deprived in housing condition if it did not have adequate material for the two of floor, wall and roof. The fifth indicator in the living standard dimension required a household to use cooking fuel better than dung, wood or charcoal. The last but not the least indicator of this dimension considered possession of assets and appliances. Household is deprived in assets if it doesn't own at least one of the assets for access to information (phone (mobile or fixed), radio, TV) neither one asset for easy mobility (bicycle, motorbike, motorboat, car, truck or animal wheel cart) nor one asset for livelihood (refrigerator, agricultural land or livestock (at least one cattle or at least one horse or at least two goats or at least two sheep, or at least 10 chicken).

3.3. Determinants of poverty: Multivariate analysis

The mere presence of an index that measures poverty, its incidence and intensity, doesn't necessarily guarantee policy implication. Therefore we need some vital analysis that shows a possible transmission mechanism between the prevailing problem, poverty, and they way out, policy interventions. One way of having this analysis is to check the causes or determinants of the measured poverty level. In economics literature regressions are widely

used to see the determining factors of poverty and the response of poverty status to changes in one of these factors while holding the change in other factors constant.

In the unidimensional monetary poverty analysis two distinguished approaches are used in modeling the determinants of poverty. The first approach estimates the determinants of logarithm of consumption at household level. This is done using a level ordinary least square regression (OLS), which is estimated taking the standard of living as a continuous dependent variable. And the second approach, models directly the determinants of the FGT poverty measures using the categorical regression techniques (Meron, 2003; Adeyemi, Ijaiya and Raheem, 2009; Jayamohan and Amenu, 2014). There are two specific reasons that we could not follow the above two approaches in this research. The first reason was about the choice of the dependent variable and the second takes place in choosing explanatory variables for the change in the selected dependent variable.

Speaking of the first reason the dependent variable is the variable that we select to show the multidimensional poverty status of a household. The use of consumption (or any other single variable) is based on the assumption that poverty can be analyzed using a single dimension of wellbeing, which is declared to be inappropriate in the multidimensional framework. Therefore we needed to look for another variable that can represent the different aspects of wellbeing. For example in this paper we have considered health, education and living standard, using consumption cannot fully represent these three dimensions. Therefore we needed a single variable that is computed considering the status of the household in these three dimensions. The first candidate for Alkire et al. (2015a), and the one used in this paper, is the censored deprivation score of households.

The censored deprivation score assumes only two values, 1 if the household is multidimensionally poor (i.e. $c_i \geq k$) and 0 if the household is non-poor ($c_i < k$). This makes it to be a binary indicator following a Bernoulli distribution (Alkire et al., 2015c). Here the common assumptions of the classic linear regression (the OLS used in the monetary approach) fall short, because the dependent variable was bounded to be either 1 or 0 and neither is continuous nor follow a normal distribution that is often assumed in linear regression models. Binary regression models are recommended and widely applied

when the dependent variable is dichotomous, as in our case. Besides these models fit well for both continuous and discrete independent (predictor) variables (Bewick, Cheek and Ball, 2005; Alkire et al., 2015a).

But our econometric model(s) had also to incorporate the fact that our research is some sort of survey research. This was because the sample was not taken randomly but cluster sampling from geographical areas was used instead and households were nested into clusters of countries. This was also the same as saying the observations had hierarchy, a two level (specifically countries then households). With such data, households within one country were more similar to each other than households from different countries. This implied households of the same country were similarly influenced by the same factors and hence the response data was not independent anymore, rather it was correlated. But there was also between-cluster variability, in that observations from two different countries more likely had different responses or characteristics. This intra-cluster similarity and inter-cluster variability could have implications for model parameter estimates (Jenkins and Bryan, 2013).

The single level regression model assumptions about the independence of the observations conditional on the explanatory variables and uncorrelated residual errors are not always met when analyzing nested data (Hox and Mass, 2005). This made the use of the traditional flat binary regression models invalid and unreasonable for this study. The violation of these assumptions would lead to biased estimates for the parameters and large standard errors if we used the flat logistic models for this study (Khan and Shaw, 2011). And this may consequently lead to incorrect tests and conclusions. Hence, in order to draw appropriate inferences and conclusions from the multistage stratified clustered survey data we better applied advanced modeling techniques.

There are some advanced modeling techniques that could be applied in our research. The first one involves pooling the data for all countries together and use cluster-robust standard errors. But this approach is conservative because though the correlations within a country are controlled, they are not explicitly modeled. The estimated parameters do not describe

the distribution of the unobserved factors. More importantly such model does not account hierarchical nature of the data (Jenkins and Bryan, 2013).

The other option was a separate model for each country. In such model the effect of unobserved factors are accounted for in the intercept. Thus it cannot be identified separately (Khan and Shaw, 2011; Jenkins and Bryan, 2013). We could also pool the data and fit a country fixed effect model. This model would produce different intercepts for each country that represents the unobserved factors that are shared commonly in a country. Therefore in such model the country effects are treated as fixed parameters rather than random terms. Besides this analysis constrains household effects to be the same and equal across countries (Jenkins and Bryan, 2013).

The last but the ideal multilevel modeling technique and the one applied in this research is the mixed effect multilevel logistic regression model. The multilevel logistic regression analysis considers the variations due to hierarchy structure in the data. It permitted the simultaneous examination of the effects of country level and household level characteristics on household level outcomes while accounting for the non-independence of observations within groups (Khan and Shaw, 2011). Therefore by use of multilevel modeling we computed mixed effects—that were, a fixed effect for both the household and country level factors and a random effect for the between country variation simultaneously. And more importantly this multilevel modelling corrected the bias of the estimates, the over/underestimation of the standard errors and lead to more accurate test results and conclusions (Roxana, 2015).

Our use of multilevel logistic regression allowed us to include macro level predictors for the household poverty status. These macro level predictors are the same for all households from the same country. We could not include these macro predictors if we applied standard single-level logistic regression technique because it would produce underestimated standard errors of higher-level parameter estimates, thus increasing possibilities of Type I errors, where the null hypothesis of no association would be rejected, while there was no true association (Khan and Shaw, 2011).

Following Hox and Mass (2005), we developed the following four random intercept fixed slope multilevel logistic models for the regression analysis. Assume that there were $j =$

1 ... 4 countries and $i = 1 \dots n_{ij}$ households that were nested within the countries. And let π_{ij} is the probability that $c_{ci} = 1$, a household was multidimensionally poor, whereas $(1 - \pi_{ij})$ is the probability that $c_{ci} = 0$ household was not multidimensionally poor, then:

Model One: This model was called the **null model**. It was a model with only an intercept and country effects represented by the random error, i.e. no independent variables were included. This model provided us with the random effect of between country variability conditional on unobserved latent variables. Thus explained variation in response due to the shared characteristics of respondents from one country. It was given by

$$\text{Log} \left[\frac{\pi_{ij}}{(1 - \pi_{ij})} \right] = \beta_0 + u_{0j} \dots \dots \dots (3.6)$$

Where

- β_0 = the coefficient of the intercept, and
- u_{0j} = random errors at cluster (country) level

Under this model, we estimated the (ICC) to determine if our choice about the application of multilevel modeling was really justified by the data. This ICC was derived from the between-cluster and within-cluster variability and presented the magnitude of between-cluster variability that was due to country effect.

Model Two: let us call this **the Feminization of poverty model**, in this model we included the gender of the household head (GHH) as the only predictor variable. This model provided the answer for the question we raised in relation to the presence of feminization of poverty in the study area. This model also estimated the magnitude the difference between the two genders.

$$\text{Log} \left[\frac{\pi_{ij}}{(1 - \pi_{ij})} \right] = \beta_0 + \beta_1 GHH_{ij} + u_{0j} + e_i \dots \dots \dots (3.7)$$

Where

GHH is the gender of the household head

GHH = 1 if the household head is female, and

GHH = 0 if the household head is male

e_i = household level error term

Model Three: This was a model for FHH. In this model we included both household and country level independent variables and estimated their effect on the likelihood of a female-headed household being multidimensionally poor. This model was a mixed effect model that we used to estimate both fixed effects of the individual and country-level factors and random intercept of between-cluster variation for female-headed households.

$$\text{Log} \left[\frac{\pi_{ij}}{(1-\pi_{ij})} \right] = \beta_0 + \beta_1 HHS_{ij} + \beta_2 \text{age}15_29_{ij} + \beta_3 \text{age}39_49_{ij} + \beta_4 EMPT_{ij} + \beta_5 MAR_{ij} + \beta_6 EDUpr_{ij} + \beta_7 EDUuse_{ij} + \beta_8 EDUhi_{ij} + \beta_9 AFS_{ij} + \beta_{10} EdExp_{ij} + \beta_{11} HeExp_{ij} + u_{0j} + e_{ij} \dots (3.8)$$

Where: *HHS* is household size

age is age of the household head

*age*15_29 = 1 if the age of the household head is 15 – 29

*age*15_29 = 0, otherwise

*age*29_39 = 1 if the age of the household head is 29 – 39, (reference)

*age*29_39 = 0, otherwise

*age*39_49 = 1 if the age of the household head is 39 – 49

*age*39_49 = 0, otherwise

EMPT is employment status of the head

EMPT = 1 if the head is employed

EMPT = 0 if the head is not employed, (reference)

MAR is the marital status of the head

MAR = 1 if the head is married

MAR = 0 if the head is not married, (reference)

EDU is the maximum education level the head has completed

*EDU*no = 1 if the head has no formal schooling, (reference)

*EDU*no = 0, otherwise

*EDU*pr = 1 if the head completed primary school

*EDU*pr = 0 otherwise

*EDU*se = 1 if the head has completed secondary school

*EDU*se = 0 otherwise

*EDU*hi = 1 if the head has completed higher education

*EDU*hi = 0 otherwise

AFS is the access the household has to financial services

AFS = 1 if the household has access to financial service

AFS = 0 otherwise, (reference)

EdExpc = government expenditure on primary education per student

HeExpc = health expenditure per capita (constant 2011 international USD)

Model Four: this was a Model for MHH. This model was just like the third model except it considered only the MHHs. The labels are the same but in this model the household head characteristics considered are of the male household heads.

$$\text{Log} \left[\frac{\pi_{ij}}{(1-\pi_{ij})} \right] = \beta_0 + \beta_1 HHS_{ij} + \beta_2 age15_29_{ij} + \beta_3 age39_49_{ij} + \beta_4 age49_59_{ij} + \beta_5 EMPT_{ij} + \beta_6 MAR_{ij} + \beta_7 EDUpr_{ij} + \beta_8 EDUse_{ij} + \beta_9 EDUhi_{ij} + \beta_{10} AFS_{ij} + \beta_{11} EdExpc_{ij} + \beta_{12} HeExpc_{ij} + u_{0j} + e_{ij} \dots \dots \dots (3.9)$$

The random error (u_{0j}) is also called random effect. Unlike the intercept which is common for all countries the random effect is specific to each country. The (u_{0j}) are mutually independent and normally distributed with mean 0 and variance σ^2_{u0} . The random effect was explained using intra-class correlation coefficient (ICC), which was calculated using between-cluster variance and within-cluster variance [$ICC = \sigma^2_u / (\sigma^2_u + \pi^2/3)$]. In log distribution, the residual variance of households within a country is zero but variance is considered constant at $\pi^2/3$.

We calculated The ICC to show the level of between-cluster correlation within a model and to compare models three and four with null model by looking at the decline of the ICC value in models three and four. We calculated Proportional change in variance (PCV) for models three and four with reference to models with no predictor variables for the two family structures separately. The result was used to show the power of the predictor variables we included in models three and four to explain the likelihood of households being poor. The PCV was calculated by $PCV = (V_e - V_{ni})$ where V_e is variance in incidence of poverty in the empty models and V_{ni} is variance models three and/or four.

To test the significance of the random variance we used 95 percent confidence interval for the ICC estimate. The size of fixed effects of household level and country level variables

we used the z-ratio. To examine the stability of effect size of explanatory variables as the result of high collinearity among the variables, we used the Variance Inflation Factor (VIF).

3.3.1. Description of study variables

Dependent variable

The dependent variable we chose to indicate the multidimensional poverty status of households was the censored deprivation score. The censored deprivation score assumes value 1 if the household is multidimensional poor, that is the deprivation score of the household is above or equal to the poverty cutoff. And it assumes 0 if the household is multidimensionally nonpoor.

Household level explanatory variables

In the monetarist methodology of modeling the determinants of the likelihood of a household to be poor various health and education related variables are used as exogenous factors (Meron, 2003). But in the multidimensional case many of these variables are directly used to construct the poverty measures. Thus considering them as determinants of poverty most of the times leads to endogeneity problem in the model (Alkire et al., 2015a). Thus we must use non-indicator demographic and socio-economic characteristics in modeling the determinants of the probability of the household to be multidimensionally poor. Therefore based on existing literature and data availability we included six household level factors as explanatory variables.

These household level demographic predictor factors about the household head were age, gender, employment status, marital status, and educational status of the household head. Regarding the household level socio economic determinant household size and access to financial services were considered.

Empirical literatures show that poverty status has some kind of quadratic relationship with age. That is the probability of incidence of poverty is high at early and elderly ages in that the household is better-off at productive ages of the household head. For this analyses we categorized the age of the household head in ten years gap into three groups for FHHs and

four groups for MHHs. Then we compared the odds of being multidimensionally poor for household heads at productive ages of (29 – 39) with other age groups.

Education level of the household head was assumed to have a negative relationship with the incidence of poverty at the household. This means household heads with lower education are more probable to be multidimensionally poor and those with better education are expected to have lower probability of incidence of poverty as compared to the former. Thus we compared the probability of households with better education with a reference group of household heads with no education.

Access to financial service was defined by the presence of a household member who has an account at bank or in any financial institution. The value for this variable was binary and assumed 1 if the household had access to the service and 0 otherwise. We expected a lesser probability of being poor in households with access to financial services.

Marital status of the household head is categorized in to two categories and have binary value. It equals 1 if the head is married and 0 if the head is not married. The household head is regarded as married if she/he is officially married or living together with a partner. Household heads that are divorced, widowed, separated or never been in a relationship are recorded as not married.

Employment status of the household head also had binary outcomes. 1 if the head was employed and 0 if not. The head of a household was regarded as employed if s/he worked in the last 12 months preceding the survey. The head was also regarded as employed if s/he had job but was on leave on the last seven days from the survey. Household heads were considered unemployed if they had no job or did not work in the last 12 months from the survey.

Household size was defined by the number of household members that were reported to be living within that household but not somewhere else. This variable had continuous values and it was assumed to have negative relationship with the incidence of poverty.

Country level explanatory variables

The poverty status of a household is also associated with the policies and political economy of the country it belong to (Wilhelm and Fistas, 2005). In multidimensional perspective government policies on human development are well recognized to have a significant impact. The allocation of public investment for human capital development is among the policies of such effect (Odior, 2014). The impact of public investment on the reduction of poverty is significant if the investments are made on pro-poor sectors like education and health (Wilhelm and Fistas, 2005; Odior, 2014).

Studies are suggesting that public investments on education and health sectors are significant in the process of poverty reduction thus affects the poverty status of the population (Zahid and Tayyaba, 20013; Odior, 2014; Omari and Muturi, 2016). Wilhelm and Fistas (2005) suggest considering the levels of per capita public expenditures is important to assess the potential impact of public investment on growth and poverty reduction. Accordingly in this research we have included the government expenditure on primary education per student as percentage of GDP per capita and health expenditure per capita as explanatory variables. These two are chosen since they are closely related with the two education and health dimensions we used to construct the multidimensional poverty index. We expect these variables to have a negative relationship with the incidence of poverty.

CHAPTER FOUR

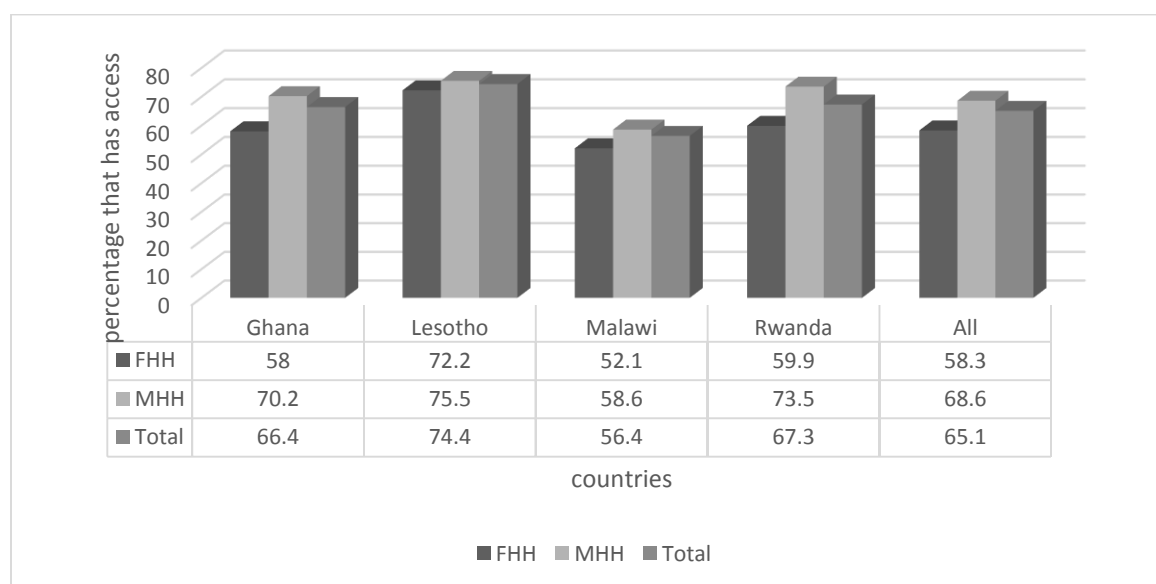
RESULTS AND DISCUSSION

This study has considered a total of 3,609 households from four Sub-Saharan African countries. Principally these households were chosen based on the availability of data for all required measurements and analysis we have conducted. As we stated in section 3.1 we have also followed the reality for the proportion of FHH and MHH both at the entire sample and in each country. In this chapter we discuss the results of the research. The first section presents the description of characteristics of sample households by gender of household head and country. We discussed the multidimensional poverty analysis in the second section.

4.1. Characteristics of sample households by gender of household head (GHH) and country

From the total sample households, larger percentage (65.1%) has got access to financial services and the rest 34.9 percent has no access to financial services. The next figure depicts the percentage of households with access to financial services for the total sample and for each country differentiated by GHH.

Figure 4.1. Percentage of households with access to financial services



In terms of financial access by households Lesotho stands out first, where 74.7 percent of the households has access to some form of financial service, followed by Rwanda (67.3%) and Ghana (66.4%). Whereas in Malawi only 56.4 percent of the households has access to open an account in a financial institution. Speaking of gender disparity larger portion of MHHs (68.6%) has access to financial services as compared to 58.3 percent of the total FHHs chosen for this research. It is in Malawi where there is a larger (6%) difference in the financial service accessibility between the two genders, i.e. 58.6 percent by the MHHs and only 52.1 percent by the FHHs, as compared to the other three nations.

Regarding the age of household heads, we have the possible minimum and maximum ages by default. This is because the DHS collects information for women between ages 15 – 49 and for men between ages 15 and 59. Most (35.9%) of the household heads, for both genders, are in the age group that ranges between 29 and 39.

Table 4.1. Percentage of household head age groups

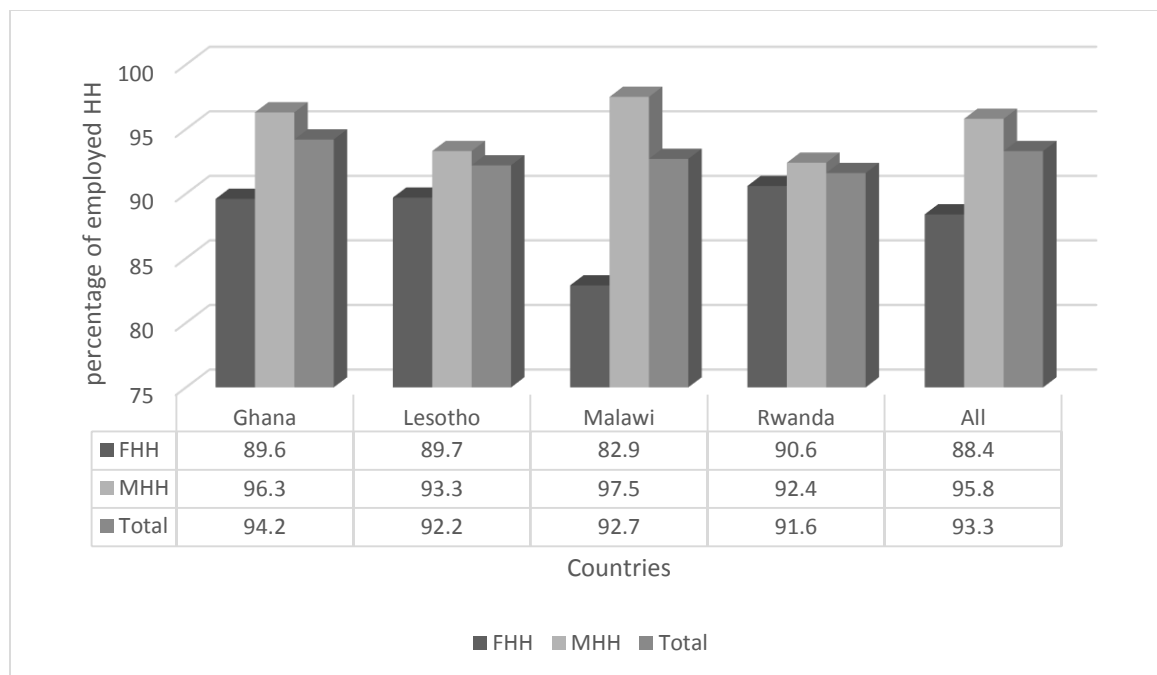
Country	Household Structure	Age group of household head			
		[15 – 29]	(29 – 39]	(39 – 49]	(49 – 59]
Ghana	FHH	33.4	35.2	31.4	-
	MHH	28.4	32.3	24.1	15.3
	All	30	33.1	26.4	10.5
Lesotho	FHH	20.6	46.4	33	-
	MHH	14.8	39.5	27.4	18.3
	All	16.7	41.6	29.1	12.6
Malawi	FHH	40.9	40.8	18.3	-
	MHH	23.8	43.7	26.4	6.1
	All	29.4	42.8	23.7	4.1
Rwanda	FHH	31.8	38.6	29.6	-
	MHH	45.7	27.4	15.2	11.7
	All	39.5	32.5	21.7	6.3
Total	FHH	33.6	38	28.4	-
	MHH	28.4	34.8	23.7	13.1
	All	30.2	35.9	25.3	8.6

Source: ICF database (2016) and own calculation

For female household heads there are fewer (28.4%) in the oldest age group. Ghana contributes the largest share for the older female household heads and Malawi does for the younger female household heads. The mean age for the FHHs is 33 years and the youngest female household head is 17 years old from Rwanda. For male household heads, the mean age is 36 and larger share is in the older age group of greater than 39 years of age.

The other characteristics we considered was employment status of the household head. As can be seen from figure 4.2 below 93.3 percent of the sample households reported that the head of the household has worked for the 12 months preceding the DHS and/or the household head had job but was on leave on the last seven days from the survey.

Figure 4.2 percentage of employed household heads



Source: ICF database and own calculation

Looking in terms of gender of the household head, though most of the heads were employed they were more of the female household heads that has no job (11.6%) than the male household heads (only 4.2%). Ghana has the larger gender disparity in terms of household heads that are employed, that only 3.7 percent of the MHHs but 10.4 percent of the FHHs were unemployed.

The table (4.2) below presents the highest education level the household head has completed. This table shows that secondary education is the most attended level, where 50.4 percent of the MHH and 48.5 percent of the FHH completed it, followed by primary education, where 24.1 percent of the total sample household heads completed. There are fewer household heads (8.1%) with no education as compared to household heads who has completed primary, secondary and higher education. The education status is also unfair against FHHs. FHHs comprise higher percentage at the lower levels and their share is exceeded by their male counterparts at better levels of secondary and higher education.

Table 4.2 percentage of household heads at different levels of education

Country	Household Structure	Education Status of Household Head			
		No Edu.	Primary Edu.	Secondary Edu.	Higher Edu.
Ghana	FHH	11.7	16	60.6	11.4
	MHH	10.8	9.7	60.5	19
	All	11.1	11.7	60.5	16.7
Lesotho	FHH	0	19.6	45.4	35
	MHH	5.4	30	37.2	27.4
	All	3.8	26.8	39.8	29.6
Malawi	FHH	7.8	33	44.8	14.4
	MHH	2.9	34.6	45.8	16.7
	All	4.5	34.1	45.5	15.9
Rwanda	FHH	7.9	50.6	26.1	15.4
	MHH	4.7	49.8	25.2	20
	All	6.2	50.2	25.6	18
Total	FHH	9	27.5	48.5	15
	MHH	7.8	22.4	50.4	19.4
	All	8.1	24.1	49.8	18

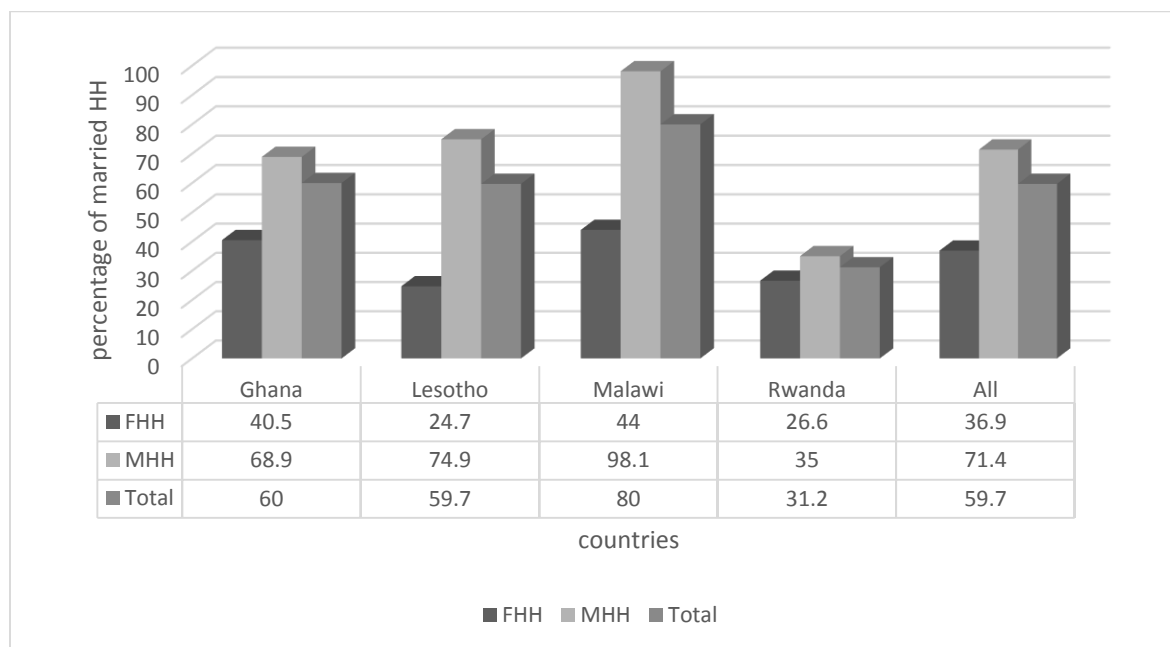
Source: ICF database (2016) and own calculation

The exception in relation to education status of the household head comes from the households we sampled from Lesotho. In Lesotho 35 percent of female household heads completed higher education as compared to only 27.4 percent of the male household heads who completed the same level. And we have no female household head that has no education at all in this country.

In relation to marital status of the head 59.7 percent of the total households reported that they are married. This means they are either officially married to or living with a partner. The remaining 40.3 percent household heads are either never been in a relationship or are divorced or one of the partners has passed away.

Showing a greater gender disparity, 71.4 percent of male household heads are reported to be married as compared to their female counterparts of which only 36.9 percent are married. This gender disparity is higher among households from Malawi. In Malawi from the total male household heads 98.1 percent are married but only 44 percent of the total female household heads reported as living with a partner (officially or otherwise).

Figure 4.3 percentage of married household heads



Source: ICF database and own calculation

What we found odd in this marital status information about the household head is that in Rwanda only 31.2 percent of household heads reported to be married to someone and the rest 68.8 percent are staggering a lonely responsibility. And, as the other countries, in this country too they are the male household heads that happen to be married most of the times.

The last household characteristics we describe is the household size. For ease of description, we analyzed the household or family size in households by dividing them into three categories. The first one was a small household size where we expected a maximum of 3 individuals. The medium family, the second group, holds four to six members. A household with seven or more members is classified as a large family size.

Table 4.3 percentage of households with different household size

Country	Household Structure	Household Size		
		[1 – 3]	(3 – 6]	>6
Ghana	FHH	69.7	27.1	3.2
	MHH	58.8	32.9	8.3
	All	62.2	31.1	6.7
Lesotho	FHH	73.2	24.7	2.1
	MHH	54.7	39.9	5.4
	All	60.3	35.3	4.4
Malawi	FHH	53.3	40.9	5.8
	MHH	23.2	56.3	20.5
	All	33.1	51.2	15.7
Rwanda	FHH	47.9	39.7	12.4
	MHH	73.2	17.7	9.1
	All	61.6	27.7	10.7
Total	FHH	61.8	32.6	5.6
	MHH	52.5	36.7	10.8
	All	55.6	35.3	9.1

Source: ICF database (2016) and own calculation

Accordingly more than half (55.6%) of the sample households are of group one supporting three or less individuals. And only 9.1 percent of households have more than six members. As far as gender of the household head is concerned women predominate on the small family size group. But in Rwanda though the percentage of small size families headed by females is higher than the other size families, the male heads are way higher in large family sizes compared to the female-headed households in the country.

The largest family sizes headed by a female household head are from Rwanda, 4 households with 10 members and one with 13 members. The average family size for FHHs is three members. More than 20 percent of these households contain three members. The largest family size among FHHs in Lesotho is eight, a single household, and the rest three countries have households with more than eight members.

4.2. Multidimensional Poverty analysis

The multidimensional poverty analysis was made, as per proposed in section 3.2.1, using the Alkire Foster multidimensional poverty measure. The application of this methodology to analyze our data provided us with three particular but related indices that enabled us to tell what the state of multidimensional poverty in the selected countries is. The subsequent subsections interpret and discuss the results of the analysis. The first subsection provides overview of the extent of multidimensional poverty. The results in the second subsection are presented exploiting the subgroup decomposability property of the AF indices, which means we decomposed the three indices in terms of GHH, to compare the poverty status of FHHs with that of their male-headed counterparts. The last subsection analyzed the effect of household and country level factors on the incidence of multidimensional poverty among households using multilevel mixed effect logistic regression. This analysis was done separately for FHHs and MHHs.

4.2.1. Extent of multidimensional poverty

Table 4.4 presents the estimated extent of multidimensional urban poverty in all households from the selected countries. Using a $k=33.3$ percent poverty cutoff 41 percent of the studied households are identified as multidimensionally poor. This means that about 41 percent of the total households are deprived in one third or more of the weighted ten indicators we

considered. Since this estimate is based on sample we can be 95 percent confident that the true parameter for all households in the region would be between 39.5 and 42.2 percent as can be seen from the 95 percent confidence interval in parentheses. The estimate for the intensity of poverty showed that on average poor households experience deprivation in 41 percent of the weighted deprivation indicators.

Table 4.4 Multidimensional urban poverty in SSA

Incidence	Intensity	Adjusted headcount ratio
0.41	0.41	0.17
(.395 - .427)⁹	(.408 - .417)	(.163 - .177)

The main output of this analysis was the adjusted headcount ratio (M_0). This index is also known as the Multidimensional Poverty Index (MPI). This MPI represents what is the share of deprivations or proportion of deprivations that the poor are facing out of the 100 percent deprivations that would happen if all of the households were deprived in everything at the same time. The 0.17 estimate for the M_0 implies that the urban poor in the sample experience almost one fifth of the total deprivations that would exist if every household in the region was deprived in every dimensions at the same time. This is the actual deprivation among the poor in proportion to maximum deprivations possible.

We have also computed country level estimates. The results, in table 4.5, for each country provided us with the certainty about the robustness of our methodology in relation to our choice about dimensions, deprivation cutoffs and poverty cutoff. The results conform to international studies like Global MPI (2016). But the estimates we have are reasonably higher than those reported in Global MPI (2016). We are okay with this difference because our analysis was conservative about some indicators than the Global MPI (2016) or others like it. For example the Global MPI considered only the floor of the house a household

⁹ Figures in parentheses for this and the next tables are 95% confidence intervals.

lives in. But in this study, as we argued for in section 3.2.2, we have expanded this indicator to include the roof and the wall of a dwelling.

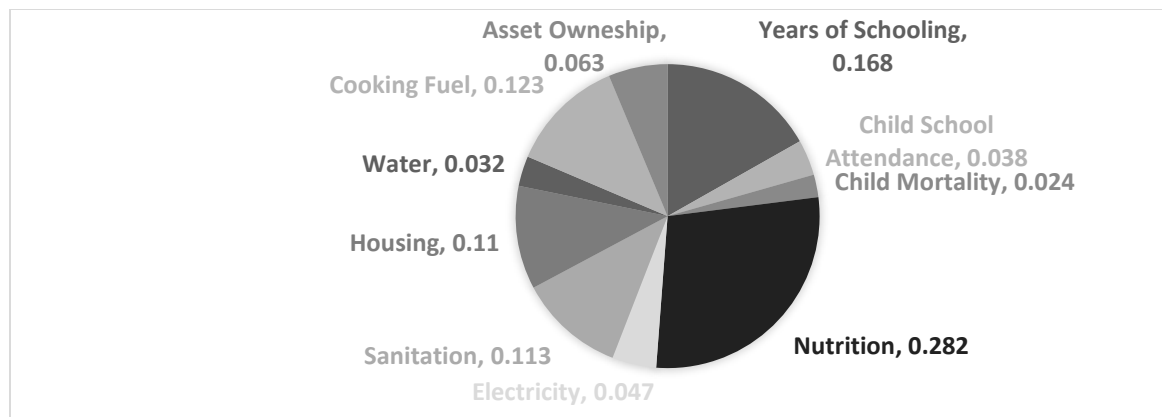
Table 4.5 Multidimensional urban poverty in selected SSA countries

Countries	Incidence	Intensity	Adjusted headcount ratio
Ghana	0.40 (.382 - .426)	0.41 (.403 - .415)	0.17 (.156 - .175)
Lesotho	0.13 (.097 - .172)	0.41 (.381 - .429)	0.06 (.039 - .070)
Malawi	0.46 (.439 - .497)	0.41 (.398 - .414)	0.19 (.173 - .202)
Rwanda	0.52 (.478 - .559)	0.43 (.419 - .442)	0.22 (.203 - .242)

As figure 4.5 (on the next page) shows more than 80 percent of the households are deprived in housing condition when the three components are considered simultaneously, obviously higher than what would be if only the floor was taken. This eventually resulted in a bit higher estimates for the multidimensional poverty indices we computed.

We applied dimensional decomposition to check the contribution of each dimension and indicator to the observed state of multidimensional poverty in the study area. The following chart shows the score of each indicator in this analysis. The scores sum up to one (100%).

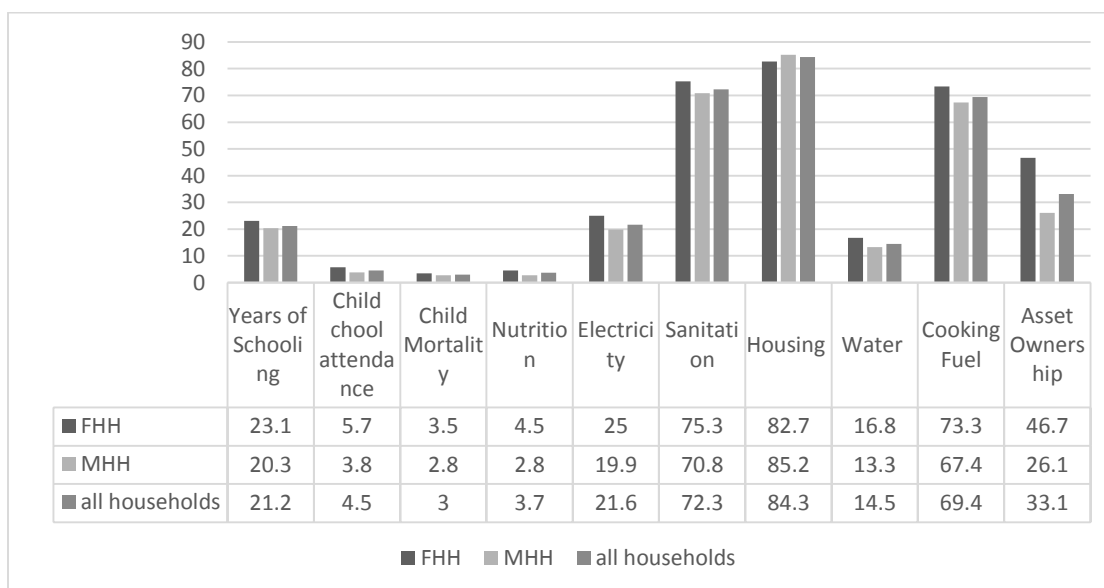
Figure 4.4 contribution of each indicator to multidimensional poverty



The chart above shows that deprivation in nutrition indicator contributes the highest share (of 28.2%) to the total multidimensional poverty measured in M_0 . The other major contributors are deprivations in dimensions of years of schooling, cooking fuel, sanitation and housing condition 12.3, 11.3 and 11 percent respectively.

The analysis in the above paragraph and chart considered only the poor, which means it censored out the nonpoor. Therefore to see the multidimensional wellbeing of the total population, both poor and nonpoor, we used the raw headcounts for each indicator. These are the incidence of deprivation in each indicator, or simply the proportion of all households who are deprived in any indicator.

Figure 4.5 incidence of deprivation in the ten indicators



The raw headcount for indicator housing condition, from figure 4.5, shows that out of the total households 84.3 percent are deprived in housing condition indicator. And this does not necessarily mean this percent of the population is multidimensionally poor. Some of them might be multidimensionally poor if they are also deprived in other dimensions and their weighted deprivation score sums up to or above the poverty cutoff. Accordingly indicators housing, sanitation, and asset ownership are those aspects of wellbeing that happened to be difficult to be achieved by larger portion of households.

Indicators child schooling, child mortality and nutrition have lower headcounts. This can be attributed to the fact that households with no legible member for an indicator were regarded as non-deprived in that specific indicator. This argument better justifies for the first two of these indicators because they are used against households with kids, thus households that did not have a child member were identified as non-deprived in these two indicators.

4.2.2. Feminization of Multidimensional Poverty

Checking for the existence of feminization of poverty from multidimensional perspective we found a positive result. From table 4.6, we can read that 43 percent of the FHHs are multidimensionally poor as compared to 40 percent of the MHHs. The scenario is serious if intensity of poverty among the poor households is compared. On average a poor FHH is deprived in 43 percent of the weighted deprivation indicators, that is eight percent higher than for an average MHH.

Table 4.6 Multidimensional urban poverty in SSA by gender of household head

Household Structure	Incidence	Intensity	Adjusted headcount ratio
FHH	0.43 (.398 - .454)	0.43 (.425 - .441)	0.18 (.172 - .197)
MHH	0.40 (.384 - .423)	0.40 (.396 - .407)	0.16 (.154 - .170)

The existence of feminization of poverty is true for each country too. In Ghana, Malawi and Rwanda all of the three indices were higher for FHH than those for MHH. The Lesotho case needs some explanation. Though lower percentage (10%) of the FHHs are multidimensionally poor as compared to 14 percent in MHHs, their score for M_0 is the same. This is an evidence for one discussion of the concept of feminization of poverty. That is what we can put in simple words as a poor FHH and a poor MHH are not equally poor. The concentration of deprivations in an average FHH is much higher than in MHH. In Lesotho a typical FHH is deprived in 47 percent of the total weighted deprivations among the poor. But this proportion was lower for a MHH, only 38 percent. The following table presents the estimated multidimensional poverty indices by country and GHH.

Table 4.7 Multidimensional urban poverty in selected SSA countries by gender of household head

Country	Household Structure	Incidence	Intensity	Adjusted headcount ratio
Ghana	FHH	0.42 (.382 - .461)	0.42 (.409 - .433)	0.18 (.160 - .195)
	MHH	0.39 (.370 - .423)	0.40 (.396 - .411)	0.16 (.149 - .171)
Lesotho	FHH	0.10 (.042 - .164)	0.47 (.417 - .516)	0.05 (.019 - .077)
	MHH	0.14 (.101 - .194)	0.38 (.363 - .412)	0.05 (.039 - .076)
Malawi	FHH	0.44 (.382 - .504)	0.43 (.411 - .439)	0.19 (.162 - .215)
	MHH	0.41 (.395 - .428)	0.41 (.408 - .417)	0.17 (.163 - .177)
Rwanda	FHH	0.54 (.479 - .599)	0.46 (.439 - .475)	0.25 (.218 - .276)
	MHH	0.50 (.446 - .557)	0.41 (.392 - .419)	0.20 (.180 - .227)

We ascertained the prevalence of feminization of multidimensional urban poverty in the selected countries using stochastic dominance analysis technique. The use of this technique helped testing the robustness of our comparison between the two family structures using poverty summary measures. According to Alkire et al. (2015d) FHHs are said to poverty dominate MHHs if the former has greater or equal score for all poverty cutoffs and absolutely greater for some poverty cutoffs than the later. The following two figures display the results for the stochastic dominance analysis by the raw headcount ratio and adjusted headcount ratios for the two household structures at different poverty cutoffs.

On figures 4.6 and 4.7 all of the points on the darker line (that represent FHHs) are absolutely higher than the points on the lighter line (for MHHs). This means for all of the five poverty cutoffs the headcount ratio and the MPI for FHHs are higher than their male-headed counterparts. This supports the original finding we have above about the existence of feminization of poverty in all households, from these countries, combined. And the gap becomes wider on the figure that shows the MPI. This can explain that the intensity of multidimensional poverty is harsh against FHHs for all of the five poverty cutoffs.

Figure 4.6 Raw headcount ratios of multidimensional urban poverty in SSA at different poverty cutoffs

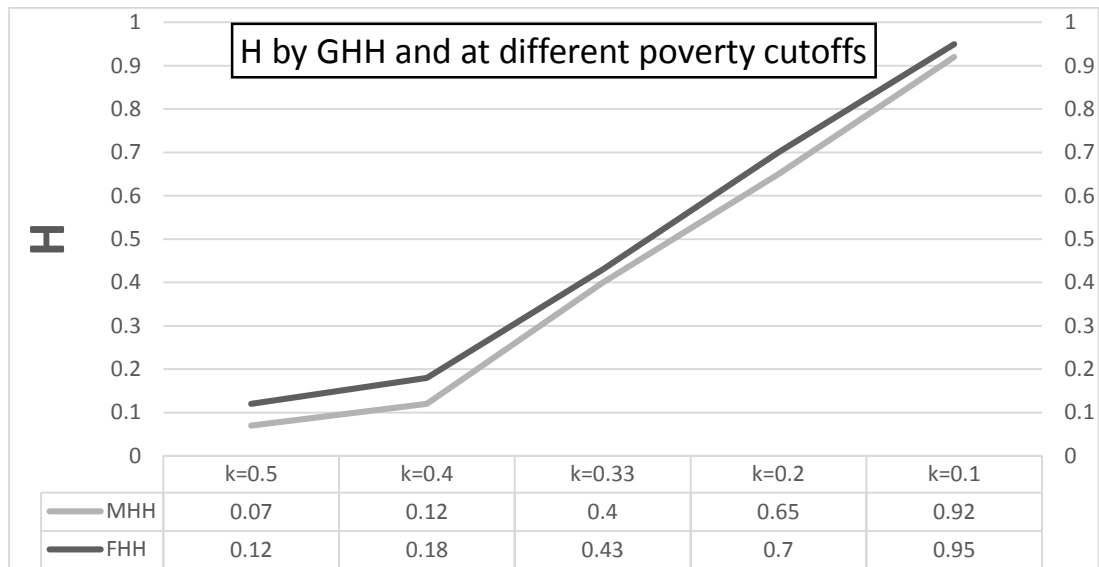
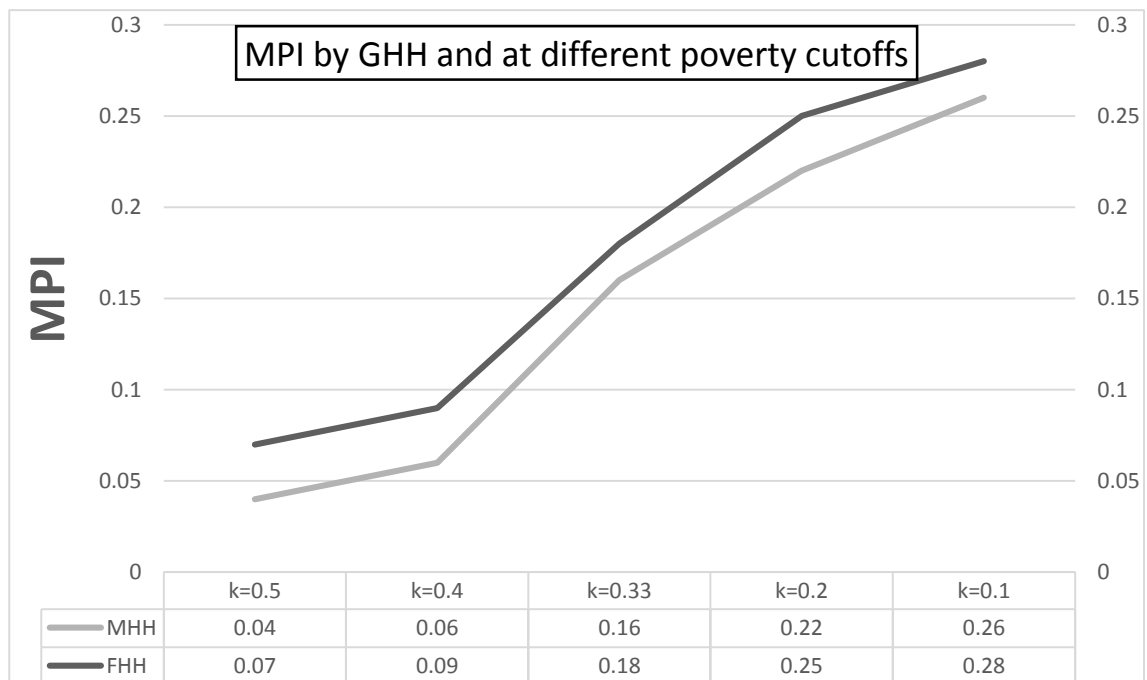


Figure 4.7 Adjusted headcount ratios of multidimensional urban poverty in SSA at different poverty cutoffs



4.2.3. Determinants of multidimensional poverty

We ran four distinct multilevel logistic random intercept regression models and examined the effect of household characteristics and country-level factors on the odds of a household being multidimensionally poor. Table 4.9 presents the results for the four models we estimated.

The first (null) model, included only random intercept to capture between-country variability. The coefficient for the constant intercept in the null model showed that the probability of a household in an average country (one with country level variance $u_0 = 0$) is 35 percent [calculated as: $\exp(-0.6404403)/(1+\exp(-.6404403))$] keeping other things constant. But the main intension behind this model was not calculating this probability, rather it was to check whether there is difference among households from different countries and similarity within households from the same country that support our application of multilevel modelling. We checked this by estimating the intra-cluster correlation coefficient (ICC).

The intra-class correlation coefficient indicated the proportion of the variance explained by the grouping structure in the population. In this model, 14.4 percent of the total variance in the likelihood of a household being multidimensionally poor was accounted for by between-country variation (ICC=0.144; 95% conf. interval (0.034 – 0.415)). Therefore we are justified by the data, that we are right in using multilevel models and grouping of the households into countries.

Similarly, the ICC was computed for models three and four to understand the relative effects of household level and country level factors on the incidence of multidimensional poverty among households. The between-cluster variability declined for both models implying including household and country level variables better explained the likelihood of incidence of multidimensional poverty among urban households in the study area than the empty model.

Table 4.9

Determinants of Multidimensional Urban Poverty Multilevel Logistic Models Results

	Null Model	Model II	Model III	Model IV
Fixed Effects				
Household Level Predictors				
Gender of household head (female)		1.158** (2.00)		
Access to Finance			0.518*** (-4.66)	0.492*** (-6.48)
Age of Household Head				
Age[15_29]			1.348* (1.80)	1.472*** (2.93)
Age(39_49]			0.383*** (-5.49)	0.555*** (-4.42)
Age(49_59]				0.498*** (-4.09)
Household Size			1.220*** (4.72)	1.223*** (7.17)
Employment Status				
Employed			0.669* (-1.93)	1.652* (1.88)
Education Status of household head				
Primary			0.391*** (-3.43)	0.249*** (-6.01)
Secondary			0.190*** (-6.30)	0.143*** (-8.94)
Higher			0.039*** (-8.68)	0.040*** (-12.27)
Marital status of household head				
Married			1.308* (1.82)	1.558*** (2.99)
Country Level Predictors				
Primary Education expense per capita [#]			-0.0301*** (-3.28)	-0.0298*** (-3.75)
Health Expenditure per capita [#]			-0.00807** (-2.97)	-0.0094*** (-5.23)
Constant	0.527 (-1.70)	0.5* (-1.85)	19.486*** (5.04)	10.230*** (4.66)

continued

Random Effects				
Constant	0.555 (-0.80)	0.548 (-0.82)	0.019** (-2.22)	0.015** (-3.05)
Intra-cluster Correlation Coefficient	0.144		0.005	0.004
Proportional Change in Variance			97.30%	96.60%
N	3609	3609	1218	2389

Note: t statistics in parenthesis; * p<0.1, ** p<0.05 , *** p<0.01; # coefficients reported

In model two we estimated that the sign for gender of the household head was positive and statistically significant at five percent level of significance. This implies that female-headed households are more likely to be multidimensionally poor than their male-headed counterparts. The average odd of being multidimensionally poor for female-headed households is 1.158 times that for male-headed households, other factors being equal for both FHHs and MHHs.

This result implies that feminization of multidimensional urban poverty exists in the sample countries. This result accords to the study by Buvinic and Gupta (1997) who observed that, out of 61 studies looking at the link between poverty and female-headed households in developing countries, 38 found female-headed households over-represented among poor households. In the recent literature too findings by Bastos et al. (2009), Apata et al. (2010), Afriyie and Amposah (2014) and Adeoti (2014) support the existence of feminization of poverty in the region.

In model three we estimated the effect of household and community level factors on the odds of being multidimensional poor among female-headed households. And model four was used to estimate that of among male-headed households. The results showed that among household level variables access to finance, age of the household head, household size and the highest level of education the household head completed has a statistically significant association with the multidimensional urban poverty status of FHHs and MHHs in SSA. Before discussion of this association we have checked the significance of these models in explaining the reality.

In addition to the ICC, we also calculated Proportional change in variance (PCV) for models three and four with reference to models (which are not reported here) with no predictor variables for the two family structures separately. The results for the PCV indicated that addition of predictors to the empty models better explained the likelihood of households being multidimensionally poor. Similar to ICC, models three and four that contain the household and country level factors simultaneously, resulted with higher PCV. The PCV in model three indicated that 97.3 percent of variance in the incidence of multidimensional poverty in a female-headed household could be explained by the combined factors we included at the household and country levels. The model for male-headed households also showed that 96.6 percent of the variance is explained by the model with independent variables at the two levels. Accordingly, models three and four combining household-level and country-level factors were selected for predicting the incidence of multidimensional poverty in FHHs and MHHs respectively. Therefore the interpretations in the next paragraphs refer to these models.

Age of the household head was supposed to have different effect depending on the age group the head belongs to. As we hypothesized the odds of being multidimensionally poor for households with younger heads (15 – 29) was higher than that for the reference group (29 – 39). This is significant for both MHHs and FHHs at 0.05 and 0.1 level of significance respectively. The odds of being multidimensionally poor decreases for both household structures as the age of the head gets older. The effect of age on the incidence of poverty is inconclusive in most studies, where some studies found a positive relation and some others found a negative relation. The finding in this study is similar to Meron (2003) and Adeoti (2014) at least in the range of age we considered.

Access to financial services has positive impact on the wellbeing of households. But the impact is higher for MHHs than for FHHs. Female-headed households with access to financial services has lower odds of being multidimensionally poor, 0.517 times that of FHHs with no access to financial services, if other factors are controlled for. But the odds is 0.492 for their MHH counterparts. And this difference was statistically significant at 0.01 percent level of significance.

The highest education level the household head completed has a negative effect on the incidence of multidimensional poverty among households of both family structures. As the highest level the head completed increases the odds of being poor decreases at one percent level of significance. The impact of primary and secondary educations were better for MHHs than FHHs. The impact of higher education was almost similar, in that FHHs with a head with higher education were 0.039 times multidimensionally poor than FHHs with no education and the odds became 0.04 for MHHs. Almost all of studies that studied the impact of education on poverty found the same result. See for example Adeoti (2014), Jayamohan and Amenu (2014), Habyarimana, Zewotir and Ramroop (2015).

Household size has a positive contribution to the incidence of multidimensional poverty among both FHHs and MHHs. The estimates indicated that log of being poor increased by an average of about 0.22 for each increase in member of a household, other factors remain constant. This positive association is statistically significant at 0.001 level of significance. Takane (2007), Achia, Wangombe and Khadioli (2010), Sekhamu (2012) found the same effect of larger household size negatively correlated with household wellbeing.

Though it has weak statistical significance of 0.1 level, Employment status of the household head has different effect for the two household structures. Employment status contributed for a better livelihood of female-headed household studied. Being employed decreased the probability of being multidimensionally poor among these households. Other things remained unchanged the odds of being multidimensionally poor for households with a working female head is 0.67 times that of households with unemployed female head. But for MHHs the effect was the other way round. The odds of being multidimensionally poor was higher for employed household heads than unemployed household heads, almost 1.7 times.

Contrary to our expectation being married increases the odds of being multidimensionally poor for both households. Other things held constant on average the odds of a married household head to be multidimensionally poor is 30 percent greater than the odds of not married female household heads. The odds for MHHs is more significant at 5 percent level of significance and the magnitude too increased to more than 55 percent. This might be attributed to the following fact. Since marital status of a household head is self-reported,

the likelihood of a household head who are married to economically inactive partner to report married is high. But the contribution of a single partner (the head or otherwise) could not drive the household out of multidimensional poverty.

For the country level predictors we considered, table 4.9 reported coefficients (not the odds ratios) estimates for ease of interpretation. The signs for these variables showed that they have an inverse relationship with the incidence of multidimensional urban poverty at household level. The test statistics showed that both factors are significant at 0.1 percent level of significance.

For a one USD increase on health expenditure per capita, on average, the log odds of being multidimensionally poor decreases by 0.008 for FHHs and by 0.009 for MHHs, other household characteristics and macro policies remain unchanged. In relation government expenditure per a primary school student we found the same impact. Other things remaining constant a one percent increase in public expenditure on a student at primary school the log odds of incidence of multidimensional poverty on household level decreases by 0.03 on average for both types of households.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1. Summary and conclusion

Women, as half of the world population, have their share in the burdens and fruits of human life. These burdens and fruits are not, however, distributed fairly between women and men. Women are accepted to be disproportionately represented among the poor. This notion is popularly known as feminization of poverty. By feminization of poverty it is meant that poverty has a gender dimension which is usually biased against women.

However the feminization of poverty needs a scrutinized analysis in relation to a specific area because women are not poorer than men everywhere. This study was concerned with the wellbeing of women in urban areas of SSA. The study of all women in the area could not be done because of limited availability of means to estimate women specific dimension of poverty and data. Therefore we analyzed the characteristics of FHHs as representative for the status of women in the region. Following this, this research studied the implication of female household headship on multidimensional urban poverty using cross country household data from four SSA countries, namely Ghana, Lesotho, Malawi and Rwanda.

Based on the fact that deprivations women experience are multifaceted this research argued that the traditional unidimensional poverty analysis is not adequate to address the issue. Therefore we sought for a multidimensional approach that can jointly address the multiple deprivations women face. Thus this study applied the Alkire Foster Multidimensional poverty analysis approach. This approach is intuitive and has useful properties which allow targeting and poverty comparison over time and across groups.

To have a full image of the extent of multidimensional poverty the study estimated the multidimensional poverty indices for the entire sample households, before making comparisons between FHHs and MHHs. Then we decomposed the MPI in terms of gender of the household head and compared the state of multidimensional poverty among FHHs and MHHs from the selected four SSA countries. The comparison helped to check whether

multidimensional poverty in the region has a feminized face. We also undergone some robustness and sensitivity dominance analysis with different values of poverty cutoff (k) to the comparison of the two household structures using poverty measures.

The study finally did multivariate analysis to examine the effect of some household and country level variables on the incidence of poverty at household level. Necessitated by the nested nature of the data, we applied an advanced multilevel modeling technique. Because the response we estimated was binary, 1 if the household is poor and 0 if the household is nonpoor, we fitted a mixed effect random intercept multilevel binary logistic regression models and ran four models. The significance and robustness of the models was checked using the intra-cluster correlation coefficient (ICC) and proportional change in variance (PCV). The results showed that there is significant between country variance and justified the application of multilevel modeling for this study.

Having understood that there is difference on the wellbeing of female-headed and male-headed households, we estimated the effect of household level socioeconomic and demographic factors on the odds of being poor for the two household structures separately. Unlike other studies on the same topic this study tried to estimate the association of household level poverty with country level policy variables, about government expenditure on education and health.

Various conclusions can be made from the analysis we made in this paper. Specifically in urban areas of the sample countries, about 41 percent of the population is multidimensionally poor. And these poor households carry one fifth of the burden of maximum total deprivations the entire households could experience if no one had anything above the deprivation cutoffs. The state of multidimensional poverty in these countries is also intense, where a poor household barely meets almost half of the requirements for a good life.

Decomposing the overall multidimensional poverty by dimensions or indicators showed that nutrition, years of schooling, and cooking fuel contributes the lion share for the poverty status within the poor households. One can easily observe that these three indicators are

from different dimensions. This has a good implication for the importance of multidimensional consideration of wellbeing. Had we used a unidimensional approach we would not have this awareness because unidimensional measures do not have such ability of simultaneous and detailed aggregation and decomposition.

Under-nutrition is a very critical problem for the society. This conclusion of ours is based on the estimates that from the total households only 3.7 percent are deprived in nutrition but this indicator contributes 28 percent to the total poverty, showing how intense it is against the poor.

Women are disproportionately represented among the poor, in that there are more (in percentage) poor FHHs than poor MHHs. This implies that feminization of multidimensional poverty exists in urban areas of Ghana, Malawi, Lesotho and Rwanda. The stochastic dominance analysis showed that female-headed households dominate their male-headed counterparts being multidimensionally poor.

This analysis of feminization of poverty using the multidimensional poverty indices is also supported by the results from the regression analysis. That is the odds of being multidimensionally poor for FHHs is 15.8 percent higher than the odds for MHHs. This result was statistically significant at five percent level of significance and in line with larger part of the development literature on feminization of poverty.

From the multivariate analysis we can conclude that there is strong relationship between the various household and country level variables and the poverty status of the household. The first of these variables is access to finance. Access to financial services has an easily intuitive positive impact on the reduction of multidimensional poverty among households. But the impact on the reduction is higher for male-headed households than for female-headed households.

Educational attainment of both FHHs and MHHs is found to be among the important factors associated with poverty and welfare status of the households. Households with illiterate household heads are more likely to be multidimensionally poor, and those

household heads with higher level of schooling are better-off than those with lower level of schooling.

An increase in household size has a negative effect on the wellbeing of households. With an addition of a single member to a household the probability of the household to be multidimensionally poor increases by 22 percent for both female-headed and male-headed households. From a multidimensional poverty perspective, addition of one member to a household implies addition of an indicator in which the household is legible. If the member is deprived in that indicator, then the household is regarded as deprived.

Employment status of the household head affects the poverty status of the households to some extent especially for FHHs. Being employed, for female household heads, decreases the likelihood of the household to be multidimensionally poor. But the estimates are not strongly significant, statistically speaking.

Government policies related to the education and health dimensions are effective in reducing multidimensional poverty in the sample countries. The increase in government spending on primary education and health expenditure per capita significantly reduces the odds of being multidimensionally poor by 0.03 and 0.01 percent respectively.

5.2. Recommendations

Based on the analysis we made and the empirical findings certain policy implications and recommendations can be forwarded. In this sub section we recommend some policies and show some directions for future research.

Governments should promote the use of national multidimensional poverty measures to assess the wellbeing of their citizens. Though unidimensional measures that are frequently used in SSA countries are easier to calculate, they should be accompanied by multidimensional approach. This provides a clear map for coordinating the design and implementation of poverty reduction programs and policies.

Those countries that are moving away from a narrow conceptualization of poverty to a comprehensive understanding of multiple deprivations should invest more in

multidimensional poverty measures. Because this is vital to establish and convey good practices for the implementation of multidimensional poverty measures that has the potential to generate significant advances in understanding the situation and to create useful policy.

The results indicated that all the three dimensions of health, education and living standard collectively contribute to the prevailing poverty among households. Therefore policies that are holistic in effect should be used so that they affect many dimensions at a time. One of such policies is a policy aimed at educating females. An increase in the number of girls in school and female literacy reduces poverty. It also implies that, in the longer term, fertility rate will fall and child survival will improve. These factors themselves contribute to higher productivity and improved livelihood.

Specifically it is found that though all of them are not identified as multidimensionally poor, at the given poverty cutoff, many households are deprived in indicators of asset, housing condition, sanitation, and cooking fuel. Thus policies that focus on improving the wellbeing in relation to these indicators are of two fold benefits. One in that they help the multidimensionally poor who are deprived in other dimensions too and the other prevent those households who are deprived in these indicators from becoming multidimensionally poor.

From the empirical results it is found that socio-economic and demographic variables have different effects for FHHs and MHHs. Thus anti-poverty policies and programs should be targeted to mitigate differences in household characteristics of access to finance, household size and education between the two genders.

Findings showed that the incidence and intensity of multidimensional poverty is higher at early ages of the household heads. Thus policies should focus on preventing early marriage. Besides such policies will also help to mitigate the negative effect of marital status on the wellbeing of the society.

Family planning programs can play a significant role in poverty reduction in the long run. In the first place these policies reduce the negative effect of large household size on the

wellbeing of households. But reducing fertility will have a positive impact on women's health, ability to work and productivity.

Increasing access of households to financial services can be used as an important mechanism to reduce poverty. Thus governments should prepare policies and programs to increase the income of households so that they can open saving accounts at financial institutions and create awareness about the benefits of using financial institutions.

The effect of government investment on education and health are proved to have the same positive effect for both male-headed and female-headed households, thus governments should increase the investments they make on these sectors. If these investments are made favoring female-headed households, they will have a higher impact on multidimensional poverty because human development will have a spillover impact on other characteristics.

Directions for future researches;

- Since the dimensions in the multidimensional poverty analysis are stocks, studies should consider the change of multidimensional poverty over time.
- Studies that focus on decomposition of multidimensional poverty in terms of socio-economic characteristics and different sectors of the economy will have good policy implications.

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