The Role of Women's Status on Children's Nutrition Security in Ethiopia

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Abstract

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Well improved health care and child nutrition is a manifestation for any country to escape from poverty. In most developing countries like Ethiopia children suffer from the burden of malnutrition. Numerous of studies in recent years have focused attention on the determinants of child nutrition in the developing countries. In the Ethiopian case, Studies show that almost half of the children are either stunted or underweight. This paper contributed to this concern by giving concern to that of women empowerment measurement variables and their correlation with nutritional status. Principally this paper examines the role of women's status on children's nutrition security in Ethiopia using the EDHS 2011 survey.

The paper employs both descriptive and Econometrics tools (both bivariate and Multivariate techniques) to show the interrelation ship among different women's status indicator variables including other socio economic variables on child nutrition. The study found that women's education, decision making role of women, women's attitude towards domestic violence and child age as a significant factor for child nutrition. The study also found that wealth index of households, availability of toilet and sanitation services as determining factor for child nutrition.

Separate regressions for rural and urban samples have been conducted and we observe that there is child malnutrition variation in terms of place of residence in which those of children who reside in rural areas are more stunted and underweight. There is also a considerable malnutrition difference among regions too. Hence, having this trend in mind intervention mechanisms not only to improve child nutrition but also so as to empower women in every aspect like Economical, social and related aspects is necessary.

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Table of Contents

Pages

List of Tables

Pages

Acronyms

Cms:	Centimetres
CSA:	Central Statistical Agency
DHS:	Demographic and Health Survey
GMR:	Global Monitoring Report
HAZ:	Height for Age
IFPRI:	International Food Policy Research Institute
MDGs:	Millennium Development Goals
NCHS:	National Center for Health Studies
SD:	Standard Deviation
SNNP:	Southern Nations Nationalities and Peoples
UNICEF:	United Nation International Children Emergency Fund
USAID:	United States Agency for International Development
WAZ:	Weight for Age
WFP:	World Food Programme
WHO:	World Health Organization
WHZ:	Weight for Height

CHAPTER ONE

1. Introduction

1. 1 Background of the Study

Improved nutrition and health is a key priority in international development. Better health and nutrition is both an end in itself and a means to escape from poverty. Child malnutrition and ill health is of utmost concern since deprivation in early childhood often causes irreversible damage to physical and mental health, reduces learning at school, and leads to lower incomes as adult (ACC/SCN and IFPRI, 2002). It is, therefore, appropriate that several of the Millennium Development Goals adopted by the United Nations reflect on child malnutrition, including the goal to halve the number of people living in hunger by 2015, and the goal to reduce child mortality by two-thirds.

Development researchers and practitioners increasingly define and conceptualize poverty in multidimensional terms, with health and nutrition being among the most important dimensions. Nowadays, Measurement of health and nutrition status is an important topic. However, indicators of health and nutrition outcomes, if chosen wisely, can also contribute to comparisons of well-being and deprivation more widely. In particular, child malnutrition indicators can help overcome some of the weaknesses that have been documented with comparisons of income/consumption poverty, such as the intractable problem of ensuring accurate monetary conversions.

Nutritional status of children is a manifestation of a host of factors including household access to food and the distribution of this food within the household, availability and utilization of health services, and the care provided to the child.

Several studies have explored interventions needed to increase a household's ability to address the causes of malnutrition. Interventions could focus on helping households use their resources more effectively to improve the nutritional status of their children as well as on increasing a household's resources (Strauss and Thomas, 1995).

According to UNICEF (2013), global progress in reducing child death since 1990 has been very significant. The global rate of under-five mortality has roughly halved, from 90 deaths per 1,000 live births in 1990 to 48 per 1,000 in 2012. The estimated annual number of under-five deaths has fallen from 12.6 million to 6.6 million over the same period. But still the world population suffer from malnutrition especially those of infants and children under the age of five are exposed to this problem in which sub Saharan Africa takes the largest share following South East Asia countries.

Encouragingly, the world is currently reducing under-five death faster than at any other time during the past two decades. The global annual rate of reduction has steadily accelerated since 1990-1995, when it stood at 1.2%, more than tripling to 3.9% in 2005-2012. Africa has seen a consistent acceleration in reducing under-five deaths, particularly since 2000. All regions with the exception of West and Central Africa as a whole have at least halved their rates of under-five mortality since 1990. Despite these gains, child survival remains an urgent concern in which the risk of dying before their fifth year age varies enormously depending on where a child is born (UNICEF, 2013).

Research on the relationship between women's status[1] and nutrition, particularly child nutrition, is continually expanding. As part of the quest to achieve gender equality, women's status has increasingly been the focus of many development interventions. In addition to being an end goal in itself, women's status is also considered as a means by

[1] According to Smith and Hadad(2000) it is *the relative status of women compared to men in the household as well as in the community as measured by decision making, attitude towards violence, education level, employment status and related others*

which to achieve other important development outcomes, such as improvements in child nutritional status. As women are often the primary caretakers in a household, intrahousehold dynamics that determine allocation of resources and their impact on individuals' well-being are increasingly a subject of analysis.

Studies that examine child malnutrition and women's status have used proxy measures of women's status, for example, indicators that depict sources of power such as education or setting of power such as customs regarding marriage (Adato and Mindek 2000; Yount 1999; Kishor 2000).

Substantial evidences by some scholars showed that households do not necessarily act in a unitary manner when allocating resources; women and men often have different preferences for allocating food and non food resources and may therefore distribute these resources differently, based on their bargaining power within a household (Alderman et al. 1995; Hoddinott and Haddad 1995; Quisumbing 2003)[2].

Studies also shows positive associations between increases in women's empowerment and improved nutrition outcomes and, conversely, that actions leading to women's disempowerment can result in adverse nutritional impacts for women themselves as well as for their children (Bhagowalia et al. 2012; Quisumbing and Maluccio 2003; Smith and Haddad 2000).

Investing in women is therefore considered beneficial for improving human capital formation, especially in terms of child nutrition, health, and education (Quisumbing 2003; Smith et al. 2003a; and Diepeveen 2012).Accordingly as empowering women is just increasing the nutritional status of a child such increase in womens capital

[2] *They tried to infer the role of women's empowerment in contributing to child nutrition with emphasis on super power of women as a care taker in a house hold.*

formation via educating them and creating awareness is better for child growth and survival.

Girma *et.al*(2002) indicated that region of residence, education of mother, education of father (mother's partner), economic status of the household, number of antenatal care visit for the mother, age, birth order and birth interval of the child were found to be determinants of child nutritional status.

Nonetheless, in the Ethiopian case, while researchers have devoted considerable attention to the determinants of child nutrition, less is known about how women's status affects child nutrition outcomes even though they have a prominent role in theoretical models (most notably Mosley and Chen, 1984; Schultz, 1984). Existing studies generally have also a limited focus in considering regional variation of child malnutrition using women's status as explanatory variables.

This paper by using evidence on different aspects of women's empowerment and endowments from mobility to decision-making power and attitudes toward verbal and physical abuse, examine the notion of empowerment and ascertain which specific aspects of empowerment matter most for child nutrition. This is important because different aspects of women's empowerment may act upon child nutrition in different ways and to varying degrees.

1.2 Statement of the Problem

Malnutrition affects the wellbeing of individuals. More specifically, the consequences of malnutrition are severe and they have irreversible and long lasting implications on those individuals who suffer malnutrition in their early childhood (Setboonsarng, 2005).

Chowdhury (2005) emphasized that, childhood poverty occurs at the most crucial period of physical and mental development such that deprivations in terms of nutrition, healthcare, education, or security even for a relatively short period of time can have long lasting and irreversible consequences on child development. Furthermore, productivity and welfare in adulthood could be adversely affected following early childhood poverty, which in turn might lead to intergenerational transmission of poverty.

UNICEF (2013) reports that, of the 6.6 million under-five deaths in 2012, most were from preventable causes such as pneumonia, diarrhoea or malaria; around 44% of deaths in children under 5 occurred during the neonatal period which account for 4 out of 5 under-five deaths globally. Sub-Saharan Africa countries including Ethiopia and South Asia countries[3] occupied the largest share for malnourished Children. In addition, level of children mortality under the age of five in Ethiopia is, 68 infants died per 1,000 live births and it is 40th in the world standard for the same trend where Sera Leone, Chad and Somalia accounted the first, second and third with 182,164 and 150 deaths per 1,000 live births respectively.

More precisely in the Ethiopian case, studies have shown that a large proportion of children have been suffering from malnutrition and that child malnutrition is a serious problem. Information obtained from the 2011 Ethiopian Demographic and Health Survey (EDHS) confirms this situation. The survey showed that there was a very high prevalence of chronic child malnutrition in which among samples of under five children (44 percent) were stunted and 11 percent in which one among ten children were severely stunted. Similarly, 29 percent of the children were underweight and among those 9 percent were severely underweight. With respect to acute malnutrition,

[3] *A study by Quisumbing and Bhagowalia(2012) in Bangladesh confirms this situation*

10 percent of the children were wasted and 3 percent were severely wasted which was far more than the 2005 EDHS survey data in which severe wasting level was 2% only. These trends infer that in the Ethiopian case child malnutrition is yet a critical problem. Even compared to other Eastern Africa member countries (Rwanda, Kenya, Tanzania, Uganda), child malnutrition is more common in Ethiopia than in the surrounding countries for which data are available (ICF International, 2012).

Apart from this, the prevalence of child malnutrition in the Ethiopian context infers a considerable variation between rural and urban areas. More specifically, malnourished children are overrepresented in rural part of the country than their urban counter parts. For instance, the prevalence rate of stunting in rural Ethiopia was 46 percent which is significantly higher than that of urban areas where 32 percent of children were stunted (EDHS, 2011).The same condition also holds for that of wasting and underweight in which regional and place of residence malnutrition variation still is one manifestation of children's nutrition security problem in Ethiopia.[4]

Existence of such soaring level of child malnutrition requires sound economic policy to tackle the major factors that results the problem is essential in order to avoid its adverse consequences. The causes and determinants of child malnutrition are complex, interrelated, and multidimensional. Smith et'al (2003) indicated that mothers are the main providers of primary care to their children, understanding the contribution of women's status on child nutrition will be identified as a key towards addressing the problem of child malnutrition. For example, Borooah (2002) indicated that womens' education benefits children in reducing risks associated with malnutrition.

Appoh *et'al (*2005) showed that mothers' practical knowledge about nutrition has important implication on nutritional status of children. On the other hand, Khasnobis

[4] *A study by Haile Kibret(2013) and Michael Tirfe (2006) confirms this situation*

and Hazarika (2006) demonstrated that improved women's relative household status leads to better nutritional status of children which seems important particularly in developing countries where women have lower social and economic status.

According to Alemu *et'al* (2002), mother's knowledge about care giving practices could affect child nutrition status in which caregivers can identify the symptoms associated with child malnutrition. Furthermore, they tried to infer that type of care givers employment was found to have a more mixed wise impact on child nutrition. According to them, child malnutrition was high in Ethiopia because women are less powerful relative to men or their spouses.

In light of this, therefore, identifying the role of women's status on children's nutrition security in Ethiopia can assist the effort towards alleviating the burden of child malnutrition. This study, though it also includes other socio economic variables, principally relies on the effects of women's relative status in their household as well as community on their children's nutrition security specific to Ethiopia.

1.3 Objectives of the Study

1.3.1 General Objective

The general objective of the study is to assess the role of women's status on children's nutrition security in Ethiopia using the 2011 Ethiopian Demographic and Health Survey data.

1.3.2 Specific Objectives

The specific objectives of the study are to:

- see the influence of women's status on children's nutritional security
- examine regional variations in terms of women status and child malnutrition

- examine variation in place of residence[5] among child malnutrition
- forward a certain policy recommendation based on the prevailing results of the study

1.3.3 Basic Research Questions

In order to achieve the above outlined specific objectives, the study tackles the following research questions.

1) Which indicators of women's status have a direct (huge) impact on children's nutrition security?
2) Is there any variation among child malnutrition interms of rural and urban samples?

1.4 Scope, Limitation and Significance of the Study

1.4.1 Scope of the Study

This study is restricted to relationship between Women's status (education level, decision making, attitude towards violence, employment and other socio economic demographic factors) and Children's nutrition security. The study is also confining to only to the case of Ethiopia using Ethiopian Demographic and Health Survey, 2011, data.

1.4.2 Limitation of the study

Basically, the study relied on secondary data source (the EDHS of 2011) and some of the variables that interest us were not correctly specified or they are missed. In some cases the age, height and weight data of a child were outlier or missed observations and hence we actually limited ourselves to a sample of 8,067.

[5] rural and urban residents

1.4.3 Significance of the Study

Achieving secured nutrition for its people, especially child nutrition is the goal of every nation. Secured from the problem of malnutrition is one of the basic pillars for the development of a given nation. Hence, this study concentrated on the issue towards removing vulnerability that may result from malnutrition, especially child malnutrition.

Studies among the relation between women's status and child nutrition in Ethiopia mostly were rely on descriptive statistics and also with greater emphasis on socio-economic and demographic factors of households including women's characteristics effect on child nutrition but not greater emphasis on women's empowerment (decision making, attitude towards violence, mobility) indices effect on child nutrition. This study is an attempt to fill the gap by including women's empowerment indices in addition to maternal endowments[6] and household socio-economic and demographic factors effect on child nutrition. As a result, this study may pay the way for further researchers to do researches related to intervention mechanisms depending on our findings.

1.5 Organization of the Paper

The remaining part of the paper is organized as follows. The second chapter provide both theoretical and empirical literature of the topic under investigation. Chapter three provides detail information about source and nature of data, model specification and way of analysis. Consequently, empirical analysis of the study under chapter four followed by conclusion and recommendation as chapter five.

[6] *For this study it includes Maternal height and age at first marriage*

CHAPTER TWO

2. Review of Related Literatures

2.1 Theoretical Literature

2.1.1 Definition of Women's Status

No consensus has been reached on a single definition of the widely employed term "women's status." It has been associated with women's autonomy, power, empowerment, authority, valuation, and position in society, and also simply with women's well-being. Women's status is sometimes referred to as gender inequality or gender equality.

Scholars of women's status classify the concept as being "non unitary," "multidimensional," and "multilevel," rendering it impossible to develop a consensus on its definition (Mason 1986, 1993; Sen and Batliwala 2000; Ember, 1997). This failure to define it is not an obstacle to understand the impacts of women's status, but it makes it especially important to clearly specify what is meant each time it is used. The following definition is used throughout this study: "Women's status is women's power relative to men's in the households, communities, and nations in which they live."

Three aspects of this definition are important to note. **First**, women's status is considered to be relative to men's rather than absolute or relative to other women's. The definition thus implicitly incorporates the idea of gender inequality argued by Ramaling et'al(1996) to be so harmful to children's nutritional status.

Second, it is founded on the concept of power. Simply put, power is the ability to make choices. It is the ability of a person or group of people to define goals and

pursue them, even in the face of opposition from others. Power is exercised through decision making and can take the form of actual decisions taken on one's own or taken jointly with another person through a process of bargaining and negotiation. It can also take the form of deception and manipulation, subversion and resistance, violence, coercion, threat, or even "non decision making," in which a person or group accepts the status quo as given without reflection or allows others to make a decision for them (Kabeer1999; Riley 1997; Sen 1990).

Third, the definition has an intra household dimension and an extra household dimension. Women experience differences in their power relative to men not only within households but also in the communities and nations in which they live. Customs and norms based in deeply held beliefs, values, and attitudes often dictate differential roles, acceptable behaviors, rights, privileges, and life options for women and men (Safilios-Rothschild 1982; Agarwal 1997; Kishor 1999; Kevane 2000; Senand Batliwala 2000; England 2000). For example, women and men may face different incentives or obstacles to engage in any employment at all or in certain types of employment, as well as different rewards and benefits from employment.

Women may garner less respect than men and face greater risk of assault, or be treated as intellectually inferior to men when they come into contact with people, groups, and institutions outside of their homes. They may find that health services for female-specific needs, such as gynaecological or maternity needs, are not available. More fundamentally, norms and customs governing social behaviour mean that some alternatives are not even considered in the domain of choice for women.

They are not conceived to be within the realm of possibility. These differences between women and men as social groups are rooted in unequal power relations

between them (Kabeer 1999; Riley1997; Sen and Batliwala 2000; Barosso and Jacobson 2000).

Because of extra household differences in women's and men's power, regardless of their power relative to their husbands, women may face more obstacles to attaining their goals and aspirations than men. Not taking into account the broader institutional context in which women and men operate may lead one to overlook important pathways through which women's status influences outcomes (Mason 1986, 1993;Safilios-Rothschild 1982; Sen and Batliwala 2000).

While the differential power of women and men outside of their households is not necessarily correlated with their differential power within households, the former influences the latter. As noted above, customs and norms determine who has "voice" indecisions, that is, who participates and thus influences them at all (Agarwal,1997; Katz,1997). Customs and norms set limits on the circumstances under which bargaining can be engaged in, for example, norms may call for silent acquiescence of women when men display anger (Kevane, 2000).

They also set the terms of the "outside options" of women and men and thus their ability to negotiate with their husbands. For example, if a woman has no better alternative than to stay with her husband in order to secure her livelihood because of discriminatory labor policies or the lack of enforced laws against domestic violence, then she will not find it in her interest to disagree with him in the case of conflict (McElroy and Horney1981; Haddad, Hoddinott, and Alderman1997).

2.1.2 Conceptual Framework

As stated in Behrman and Deolalikar (1988), a theoretical framework for the determinants of health and nutrition is essential in order to analyze these variables in an organized manner and to be able to interpret empirical studies. Therefore, the conceptual framework guiding the empirical analysis for this study is based on the United Nations Children's Fund's framework for the causes of child malnutrition and the subsequent extended model of care as presented in Engel, Menon, and Haddad (1999), as cited in Smith and Haddad (2000) (see the figure in Smith and Haddad, 2000).It presents a useful generalized understanding of how child's nutritional status and/or health are the outcomes of a multi-sectoral development problem that can be most effectively analyzed in terms of immediate (the most proximate level), underlying, and basic (the deepest level) causes.

It is shown in the framework that a child's nutritional status is the result of the interactions between the child's dietary intake and the child's health status, at the immediate level. Smith and Haddad (2000) argue that a child with inadequate dietary intake is more susceptible to disease and, disease in turn depresses appetite, inhibits the absorption of nutrients in food, and competes for a child's energy. Thus, dietary intake must be adequate in both quantity and quality, and nutrients must be consumed in appropriate combinations for the human body to be able to absorb them.

On the other hand, the immediate determinants themselves are stated to be influenced by three underlying determinants manifesting themselves at the household level. Thus, according to Behrman and Deolalikar (1988), since the proximate determinants of a child's health and nutrition usually are decisions made by the household in which the child lives-given assets, prices, and community endowments, a natural starting point is the determination of child's health and nutrition at the household level. The underlying

determinants stated in the framework are food security, adequate care for mothers and children, and a proper health environment and services.

In the conceptual framework, the degree to which the three underlying determinants are expressed, positively or negatively, is a question of available resources. Food security, for instance, is achieved when the household have the resources available for food production, food purchase or if the household gains in-kind transfer of food from outside sources. Similarly, care, which is quoted in Smith and Haddad (2000) as the provision in households and communities of "time, attention, and support to meet the physical, mental, and social needs of the growing child and other household members", is determined by the caregiver's control of economic resources, autonomy in decision making, and physical and mental status.

All of these resources for care are influenced by the caregiver's status relative to other household members. A final resource for care is the caregiver's knowledge and beliefs. The third underlying determinants of child nutritional status, health environment and services, rests on the availability of safe water, sanitation, health care, and environmental safety, including shelter. It is indicated that a key factor affecting all underlying determinants is poverty.

Smith and Haddad (2000) made it clear that the effects of poverty on child malnutrition are pervasive. It is argued that poor households and individuals are unable to achieve food security, have inadequate resources for care, and are not able to make use of (or contribute to the creation of) resources for health on a sustainable basis.

Finally, the framework shows that the underlying determinants of child nutrition (and poverty) are, in turn, influenced by basic determinants, which include the potential resources available to a country or community, limited by the natural environment,

access to technology, and the quality of human resources. Political, economic, cultural, and social factors affect the utilization of these potential resources and how they are translated into resources for food security, care, and health environments and services (Smith and Haddad, 2000).

2.1.3 Nutritional Status Indicators and Child Welfare

In this study, the words "nutrition" and "health" are used interchangeably because both outcomes are too related that it is difficult to disentangle one from the other, and thus both may signify the same thing when children are considered.

Though the word "malnutrition" is associated with both undernutrition and overnutrition (Smith and Haddad, 2000), in this paper it is meant to refer to undernutrition. Malnutrition literally means "bad nutrition" and technically includes both over and under nutrition. In the context of developing countries, under nutrition is generally the main issue of concern, though industrialization and changes in eating habits have increased the prevalence of over-nutrition. Nonetheless, within the context of World Food Programme (WFP) programs and assessments, malnutrition refers to under-nutrition unless otherwise specified.

WFP (2005) defines malnutrition as "a state in which the physical function of an individual is impaired to the point where he or she can no longer maintain adequate bodily performance process such as growth, pregnancy, lactation, physical work and resisting and recovering from disease."

Among others, health and nutrition are the most critical components of household basic needs in developing countries (Behrman and Deolalikar, 1998). Nutritional status of children below age of five is among the many indicators of household well being and it is one of the determinants of child survival (Zere and McIntyre, 2003).

According to Behrman and Deolalikar (1998), health status in micro empirical studies can be described by the following measures: clinical measures of bodily attribute; anthropometric measures of height, weight, triceps skin fold thickness, arm circumference etc; respondent reported diseases symptoms; reports on incapacity for undertaking normal respondent activities.

These nutritional indicators differ from each other on the basis of cost considerations, measurement error they entail, and the dimension of health they refer to. Clinical measures of bodily attributes are costly because data collection and analysis are expensive and time consuming. Therefore, they are less practical and socioeconomic data sets rarely have these measures of health status. The last two measurements are relatively cheaper and frequently in use. Although anthropometric measurements are not cheaper, they are commonly utilized for they are relatively easy to assess health and nutritional status.

2.1.3.1 Anthropometric Indicators of Child Nutritional Status

Anthropometric information can be used to determine an individual's nutritional status compared with a reference mean. It can be also used to determine the prevalence of malnutrition in a surveyed population. Acute and chronic malnutrition is measured and quantified through anthropometric tools. Within both emergency and development contexts, population based nutrition indicators can be a useful tool for assessment, prioritization and targeting. The basic information and measurements that constitute anthropometric measurements in children are; age, sex, height or length; height and weight in which these measurements are the key building blocks of anthropometrics and are essential for measuring and classifying nutritional status in children under five years (WFP, 2005).

The word “Anthropometric” is generally meant to represent the measure of people’s growth indicators such as weights and heights (related to their age and sex). It is used for growth assessment and is a single measurement that best defines the health/nutritional status of a child (Blossner, et. al., 2005). According to this measurement, the nutritional/health status of children is determined by comparing growth indicators with the distribution of the same indicators for “healthy” reference group, and identifying “extreme” or “abnormal” departures from this distribution. The international reference standard that is most commonly used (and recommended by the WHO) is that of the data on the weights and heights of a statistically valid population (US National Center for Health Statistics (NCHS)) of healthy infants and children in the US.

There are three ways of expressing these comparisons: Z-score (standard deviation (SD) score), percent of median, and percentile. But the interest here is on the SD score (Z-score) and it is defined as the difference between the value for an individual and the median value of the reference population for the same age, height, or weight divided by the standard deviation of the reference population.

Based on this comparison method, the three most commonly used anthropometric indicators for infants and children are;

Weight-for-height (WHZ): measures body weight relative to height and is normally used as an indicator of current nutritional status. Extreme cases of low W/H (Z-score below -2 SD) are commonly termed as “wasting”. It refers short term or acute malnutrition. It reflects acute undernutrition. It is defined as the percentage of children aged 0 to 59 months whose weight for height is below -2 standard deviations (moderate and severe wasting) and -3 standard deviations (severe wasting) from the median of the WHO Child Growth Standards.

Height-for-age (HAZ): reflects cumulative linear growth. Extreme case of low H/A (Z-score below -2 SD) is referred to as "stunting." It reflects chronic undernutrition during the most critical periods of growth and development in early life. It is defined as the percentage of children aged 0 to 59 months whose height for age is below -2 SD deviations (moderate and severe stunting) and negative three (-3) standard deviations (severe stunting) from the median of the WHO Child Growth Standards.

Weight-for-age (WAZ): reflects body mass relative to age. The severe case of low W/A (Z-Score below -2 SD) is commonly referred as "underweight. It reflects both short term and long term malnutrition; is a composite form of undernutrition that includes elements of stunting and wasting. It infers the percentage of children aged 0 to 59 months whose weight for age is below -2 standard deviations (moderate and severe underweight) and -3 SD (severe underweight) from the median of the WHO Child Growth Standards (WHO, 2006).

2.1.3.2 Causes of Child Malnutrition

An understanding of the most important causes of malnutrition[7] is imperative if the current unacceptably high numbers of malnourished children are to be reduced. Most researchers and scholars like Smith et'al (2000) assumed that the primary cause of malnutrition is food insecurity. But contrary to this, World Bank (2012) Studies suggest that food is not the only and not even the main cause of malnutrition. Many children in food secure environments and those in non poor families are malnourished because of poor maternal knowledge, inappropriate caring practices, lower women

[7] As stated by *Smith et.al(2000) Malnutrition is associated with both undernutrition and overnutrition. In the report, the term refers to cases of undernutrition as measured by underweight rates. A child is considered underweight if the child falls below an anthropometric cut off of –2 standard deviations below the median weight-for- age z-score of the National Center for Health Statistics/World Health Organization international reference.*

status in the house hold relative to men and inadequate access to health, water and sanitation services.

The causes of malnutrition are complex, multidimensional and interrelated such that they range from factors as broad as political instability and socioeconomic growth to those as specific as diarrheal disease (Smith and Haddad, 2000). Likewise, the solutions for dealing with malnutrition vary from efforts to maintain political and economic stability at national level to those focusing on enhancing access to sanitation and health services in individual communities.

UNICEF's (1998) conceptual framework on child malnutrition, emphasize on the role of immediate and underlying determinants that cause child malnutrition. The extended UNICEF model underscores the importance of the physical and mental well being of women, support from family and community, education all of which directly impact their ability to care for children. The social context of the household such as culture, traditions, occupation and incomes determine the relative status of women. The status of women in turn can determine health and dietary intakes of children in different ways. For instance, female participation in household decisions regarding the health of children or own health, large household purchases and those for daily needs, is essential for improving child nutrition in which it is at low stream in most developing countries. The degree of autonomy a woman has making decisions in a household can effectively determine if a child is given a proper diet and medical help.

It is shown in the framework that a child's nutritional status is the result of the interactions between the child's dietary intake and the child's health status, at the immediate level. Smith and Haddad (2000) argue that a child with inadequate dietary intake is more susceptible to disease and, disease in turn depresses appetite, inhibits the absorption of nutrients in food, and competes for a child's energy. Thus, dietary

intake must be adequate in quantity and in quality, and nutrients must be consumed in appropriate combinations for the human body to be able to absorb them.

It is indicated that a key factor affecting all underlying determinants is poverty. Smith and Haddad (2000) made it clear that the effects of poverty on child malnutrition are pervasive. It is argued that poor households and individuals are unable to achieve food security, have inadequate resources for care, and are not able to make use of (or contribute to the creation of) resources for health on a sustainable basis.

Finally, the framework showed that the underlying determinants of child nutrition (and poverty) are, in turn, influenced by basic determinants, which include the potential resources available to a country or community, limited by the natural environment, access to technology, and the quality of human resources. Political, economic, cultural, and social factors affect the utilization of these potential resources and how they are translated into resources for food security, care, and health environments and services (Smith and Haddad, 2000).

2.1.3.3 Household Level Socioeconomic Determinants of Child Nutritional Status

In the literature, the main household level socioeconomic determinants of child nutritional status include education of parents, household economic status, women's status relative to men's, and access to water and sanitation services. In one way or the other, all these are related to at least one of the three underlying causes of child malnutrition namely household food security, care for children and mothers, and household health environment (Smith et' al, 2003). The mechanism by which they influence nutritional status of children is discussed as follows.

I) Household economic status (Wealth index)

The economic status of a household where a child lives has been identified as one of the key determinants of child nutritional status. Smith et al. (2003) stated that household economic status significantly affects access to food (a necessary condition for food security). It also dictates possession and utilization of child care resources on a sustainable basis. Relatively better economic status of a household permits more spending on food, clean water, hygiene, and preventive health care (Alderman etal., 1995). In addition, it allows a more diversified diet and effective child care arrangements.

II) Maternal socioeconomic Status in the household and community

Included in this category which is a focus of this study are measures of women's status indicators like attitudes toward domestic violence, decision making role, maternal education, maternal employment status, and maternal endowments such as height and age at first marriage.

Mothers' education

In many developing countries particularly in Africa, tradition has laid the responsibility of child care on women which begins at infancy and continues until teenage and adulthood (Oyekale and Oyekale, 2000). The implication is that women are key players in the growth and development of a child. In enhancing the quality of care and nutritional status of children, the role of mothers' education is widely recognized.

Hobcraft (1993) presented Caldwell's (1979) suggestion regarding the pathways by which mothers' education might enhance child survival other than through enhanced economic status. Education improves the ability of mothers to implement simple health knowledge and facilitates their capacity to manipulate their environment

including interaction with medical personnel. Furthermore, educated women have greater control over health choices for their children.

Smith and Haddad (2000) emphasized that education of women has several positive effects on the quality of care rendered to children since women are the main care takers of children. Their ability to process information, acquire skills, and model positive caring behaviour improves with education. Educated women use health care facilities, interact more effectively with health professionals, comply with treatment recommendations, and keep their environment clean. In addition, mothers that are more educated are committed to childcare and interact very well with their children.

Employment status of women

The effect of maternal employment on the well being of children has been controversial and it appears difficult to determine the net effect. Crepinsek and Burstein (2004) underscored that employment of mothers can have both positive and negative implication on children's dietary intake. On the one hand, the employment of mothers adds to family income and this may help to ensure stable supply of quality food through increased expenditure. On the other hand, mothers' employment may leave them with lesser time for caring and supervision of the activities of their children, and preparation of food. This appears more apparent under the assumption that no care taker would be motivated as mothers.

Mentioned in Crepinsek and Burstein (2004), the presence of other adults in a household, that household's income net of a mother's earning and age of children are likely to affect the net effect of maternal employment.

Freedom of mobility

Freedom of mobility outside the home could affect the care available to both the mother and the child (Shroff et al., 2009). Greater mobility indicates not only the

degree to which a woman can move about but also her capability to be mobile independently or without permission. This can affect the nutritional status of children in several ways. Access to markets to purchase food, medicines, and other essentials and access to schools can improve knowledge about nutrition and health. Limited mobility can also prevent women from making visits to a health center, affecting their own and their children's nutrition. Women with limited mobility are likely to have fewer social exchanges and thus limited knowledge about feeding practices, both breastfeeding and complementary feeding (Smith et al., 2003).

Attitudes toward domestic violence

Among women empowerment indices variables, attitude towards violence is one of the factors that may affect child nutrition security. Exposure to intimate partner violence directly influences the physical and mental well-being of women and is associated with such health outcomes as depression, anxiety, and low self-esteem and self-efficacy (Smith et al., 2003; Ackerson and Subramanian 2008). A woman's lower status implies a greater dependence on her husband and a higher probability of experiencing domestic violence. Physical abuse hinders a woman's ability to provide adequate care through diminished physical capacity, increased psychological stress, and possibly nutritional deprivation both for her side and in return her child as well.

Decision making role

Women's decision-making role in a community as well as in a household may have a significant role in alleviating children's nutrition security. A study on Bangladesh by Quisumbing et al. (2012), inferred that women's participation on household decision making plays a greater role in improving their children nutrition security problem.

Maternal endowments

Maternal endowments such as maternal height and age at first marriage are equally important influences over child nutrition. A woman's short maternal stature, which reflects lack of long-

term investment in her health, is associated with a higher rate of death for her children and a greater likelihood of her children being underweight and having a reduced rate of growth (Christian 2010; Subramanian et al., 2010). Both height and age at first marriage of a woman are therefore measures of women's empowerment maternal endowments which plays a crucial role in determining nutritional status of children.

Water and sanitation services

Access to safe water and sanitary disposal of wastes are regarded as the main criteria not to exposed human beings to become infectious with diseases such as diarrhoea and intestinal parasites (UNICEF cited in Smith et al., 2003). Where there is a better access to safe water and quality sanitation, the incidence of various illnesses will decline (Smith and Haddad, 2000).

World Bank (2006) stated that improving access and quality not only reduces transmission of waterborne diseases but also saves women the extra time they spend on carrying water which can be allotted to child care and feeding or income generating activities.

2.1.3.4 The Links between Women's Status and Child Nutritional Security

In this section the relationship between women's status and child nutritional status are discussed with special emphasis on care for children and children's birth weights. In many countries women play a major role in maintaining household food security (Quisumbing et al., 1995) and household health environments (Hoddinott, 1997).

Increasing women's human capital is one of the most effective ways to reduce poverty and to decrease children's undernutrition. Research in Bangladesh, Ethiopia, Indonesia, and South Africa shows that assets that women bring to marriage play a

significant role in how the household makes its decisions. Higher women's assets are associated with a higher share of household spending going to education especially girls' and a lower rate of illnesses in girls (Quisumbing and Maluccio 2000; Quisumbing and de la Brière 2000). Because mothers' education is a critical input in the care and nutrition of infants, investments in girls' education will benefit their adult incomes and capabilities and the welfare of their children (GMR, 2013).

Similarly, the ability to move out of one's home alone or with children could restrict or increase the care available to both the mother and the child. Greater mobility can affect the nutritional status of children in several ways. Access to markets for household purchases of food, medicines and other essentials and access to schools can lead to improved knowledge about nutrition and health. Restricted mobility of women can also prevent them from making visits to the health center thus affecting their own and child health.

The control over financial resources could effectively change the composition of household purchases. Evidence suggests that women's control over assets is particularly important for household food security as well as for child outcomes because women invest substantially in nutrition, education and health care.(Quisumbing et al.,2010).

Using Bangladesh DHS data Quisumbing et.al (2010) showed that malnutrition among children in Bangladesh, especially chronic malnutrition, is significantly affected by attitudes towards domestic violence, maternal education and health, and age at first marriage. According to them, acceptance of domestic violence is associated with lower height-for-age z-scores both for boys and girls but not with weight-for-height. Short-term malnutrition captured by weight-for-height z-score is associated with maternal education and household wealth but not with other empowerment variables.

Women are primary caregivers and influence child nutrition directly through improved childcare practices and indirectly through improvements in their own nutrition (Smith et al., 2003). Generally, relative to men, women with low status tend to have weaker control over resources in their households, stricter constraints on their time, limited information about health services, and poorer mental health and self-esteem. These factors can seriously impinge on a woman's ability to care for her; they may also have long-term negative effects on children's birth weights and subsequent growth and on the quality of care provided to children (Engle, Menon, and Haddad 1999; Kishor 2000). Several studies provide evidence that women's empowerment exerts a significant influence on child nutrition (Smith et al., 2003; Frost, Forste, and Haas 2005;Guha-Khasnobis and Hazarika 2006; Ackerson and Subramanian 2008).

Consequently, improving the nutritional status of women during pregnancy and also ensuring that girls have good nutrition in their early childhood might lead to a reduction in child malnutrition.

2.1.3.5 Effects of Child Malnutrition

A decline in an individual's anthropometric index from one point in time to another could indicate illness and/or nutritional deficiency that may lead to serious consequences on those individuals specially children under consideration. At an individual level, malnutrition in early years of life has a substantial damaging effect in that malnourished children face growth failures, mental retardation, increased severity of infections, and low birth weight (Reid, 2000).

According to smith et.al(2000) Child malnutrition, encompassing both undernutrition and overweight, are global problems with important consequences for survival, incidence of acute and chronic diseases, healthy development, and the economic

productivity of individuals and societies. Maternal and child undernutrition, including stunting, wasting, and deficiencies of essential vitamins and minerals, was the subject of a Series problem which makes the developing world specially a have a less nutritional balanced individuals starting from their child hood to intergenerational transmission of poverty as well. According to them on one way or the other hands if children's malnutrition rate is high during their early stages of development, it will dampen their thinking ability and also inter generational transmission of child hood poverty will be manifested. If thus is the case the developing words at the last will be exposed to less educated and knowledgeable societies with a greater dependency on developed countries as their off springs have been exposed to diseases and other natural hazard diseases.

When children are malnourished, limited bodily resources are conserved and directed away from brain and cognitive development for fighting infections (Moore, 2004). Impaired brain and cognitive development may result in learning difficulty in school and with regard to important life skills. In addition, malnutrition in early years of life impairs physical development and it reduces stature and physical development. These adverse mental and physical developments in turn shape future market opportunities and earning prospects through reducing schooling and post-schooling productivity (Behrman and Hoddinot, 2001).

Those surviving malnutrition as children are less productive both physically and intellectually, and suffer from chronic illness (UNICEF, 1998).These damaging effects of malnutrition on health, brain development, intelligence, educability, and productivity are largely irreversible (World Bank, 2012). According to World Bank (2012), malnutrition undermines economic growth and perpetuates poverty. Failures to

deal with the problem have manifested themselves in terms of inadequate progress towards the achievement of the Millennium Development Goals (MDGs).

Moreover, malnutrition poses a serious health problem. It causes more than half of all child deaths worldwide resulting in a major waste of human energy (Smith and Haddad, 2000). It is also a major contributor to the burden of diseases (mostly in developing countries) which subsequently has led to increased opportunity cost of health spending distorting economic resource allocation (World Bank, 2012).

The consequences of child malnutrition include poor physical development and limited intellectual abilities which can have negative impacts on economic growth because they diminish the working capacity of these children when they reach adulthood (Girma and Genebo, 2002; Alderman et al., 2004).

Moore(2004) study confirmed that, as a child is more and more exposed to any child hood problem during their early infant age periods, it dampen their nutritional status not only from the present stage of malnutrition but also will result in bad effects of children growth performance as a whole.

A study by Mosley(1984) on developing countries child survival as a means to escape from poverty showed that among those of developing country infants below the age of five, those of around 45 percentages have been exposed not only to short term as well as long lasting child malnutrition but also they were suffer from problems of dietary intakes .It entirely come up with a bad and shocking result on the status of children growth performance with emphasis given to their dietary intakes as well as nutritional statues as measured by stunting and underweight. As clearly stated on the report, nearly 50 percent of children have been damaged by the shortage of dietary intakes in which sub Sub-saharan Africa and south East Asian member countries accounted for

the largest share interms of dietary intake as well as normal food staffs supply problems.

2.3 Empirical Literatures

2.3.1 Regional Levels and Trends of Malnutrition in Developing Countries

Malnutrition is a malicious problem of developing countries and yet it is preventable if dealt with on time. The alarming situation in the prevalence of child malnutrition in developing countries indisputably raises the need for monitoring the extent and distribution of malnutrition so as to help the most affected by setting priorities, for instance, of food-targeting policies to the severely malnourished groups. In their effort to do this, Smith and Haddad (2000) summarized the regional levels and trends of child malnutrition prevalence of 63 developing countries for the period of 1970s-1990s.

The authors reported that except for Sub-Saharan Africa, there was some reduction in the level of malnutrition during the given period. South Asia and East Asia were the two regions whose malnutrition rate declined the most (i.e. from 69.1percent in 1970s to 55.7 percent in 1990s for South Asia; and from 45 percent in 1970s to 19.4 percent in 1990s for East Asia). On contrary, the levels of malnutrition for Sub-Saharan Africa have increased from 27.2 percent in 1970s to 33.7 percent in 1990s (Smith and Haddad, 2000).

Peter (2002) tried to show the interrelation ship among maternal employment status and its effect on that of child health and schooling attendance in which he concluded that in most developing countries women are primary care takers for their child and

exposed to loads relative to their spouses in which they spent much of their incomes on child nutrition where as men do not do so. He tried to concentrated on women's crucial responsibility in alleviating their children health as well as school enrolment via exposing their selves to other extraordinary burdens in which most men did not like to do. Furthermore, he tried to infer that compared to women employment and generation of income, Men's employment and children's welfare are less interrelated in which the former plays an important role in solving malnutrition.

Glewwe (1999) showed that mother's health knowledge alone appears to be the crucial skill in improving children's nutritional status. Moreover, he founds that such knowledge is acquired outside the classroom, though its acquisition is facilitated by the numeracy and literacy skills obtained through formal education. According to him, even in communities where formal education is limited, it may be possible to impart nutritional knowledge with specific child malnutrition education programs.

Furthermore, according to the World Bank (2012) report, Child malnutrition has increasingly emerged as a serious problem calling for immediate actions to address its adverse consequences. Though most developing countries are on track to reach the income poverty target of the Millennium Development Goals, this may not be the case when it comes to child nutrition goal. It appears that only 26 percent of developing countries are on track towards the Millennium Development Goal of reducing child malnutrition by half. More worryingly, the nutritional status of children in twenty six developing countries most of which are African countries has been deteriorating. Nearly one-third of the world's children suffer from either underweight or stunting.

Among the developing regions, Asia hosts the highest rates and the largest number of malnourished children. In East Asia, Latin America, Eastern Europe, and Sub Saharan Africa, many countries suffer heavily from the burdens of malnutrition. The

prevalence of malnutrition has been declining in many parts of the developing world but Sub Saharan Africa is the only exception where the prevalence of child malnutrition is on the rise.

A study by Setboonsarng et al.(2005) on child malnutrition indicated that every nation, which seems on track towards achieving the MDGs agenda should have to, at least reduce the level of child malnutrition though still it has to be eradicated. They confirmed that child malnutrition is a basic and pillar condition to show under development for all those countries who are not able to reduce or eradicate the problem. The emphasis was is not whether the countries or nations included in the study are either rich enough to have basic supplied of food for their infants or not, rather it entirely concentrated on the capacity of each nation or individual to make their children better off interms of nutrition.

In general, World Bank (2013) report identified that child malnutrition remains a serious health problem in many developing countries. Though the years ahead promise a decline in the prevalence of child malnutrition for many developing countries, this might not be observed for many African nations.

2.3.2 Determinants of Child Malnutrition

Wamani et al. (2004) conducted a study in rural district of Homia, Uganda. The study indicates that, Children from non-educated mothers were significantly likely to be stunted than children whose mothers' attained an above primary level education. Ownership of land which is perceived to be ultimate source of food and socioeconomic status showed no association with inequalities in health and nutrition of children even in the bivariate analysis. This was attributed to the fact that the majority of the households had very small land holdings which reduces differentials in

nutritional status among children. An interesting finding of the study is that the risk of being stunted varies by sex of a child such that boys face a higher risk of being stunted. Particularly, this gender differential in stunting is significant among the poor household.

Olaniya (2002) examine the role of household resources and community factors on nutritional status of children in Nigeria. The household and community level variables include parental education, household income and assets, and access to water supply and sanitation services. In addition, parental height, sex of household head, and age and sex of a child were included. The result showed that household resources and community level variables are important determinants of child nutritional status. Parental education, birth order, and healthcare and sanitation service availability were found to be significant determinants of child health.

Khasnobis and Hazarika (2006) examined the effect of women's intra-household status relative to men on food security of Pakistani children as measured by anthropometric measures of nutritional status. The measures chosen for measuring women's status included whether the woman is working for cash income, her age at first marriage, percentage age difference between her and her husband, and the difference between their years of education. The multivariate analysis showed a strong link between women's status and child health. Higher educational attainment of mothers and cash earning had a strong positive impact on child nutritional status. Differences in age and educational achievement affected adversely the nutritional status of children. The authors underscored that this positive association of women's status with nutritional status of children implies that bargaining is the mechanism which governs household resource allocation.

Appoh and Krekling (2005) investigated the role of maternal nutritional knowledge on child nutritional status as measured by weight-for-age z-score in the Volta region of Ghana. The study sample included 110 child/mother pairs in which case half of the children were malnourished and the remaining were well nourished. Index for nutritional knowledge was calculated on the basis of mothers' responses to eight nutrition related questions. The questionnaire gathered information on mothers' knowledge about the importance of colostrums, the time breastfeeding was initiated and complimentary food was introduced, the type of complimentary food fed to the children, and whether mothers had food taboos.

Quisumbing et al. (2012) study on Bangladesh inferred that child nutrition entirely will depend on women's entire household economic status relative to men or other communities. Here, as a women empowerment variable they inculcated decision making, women's justification for violence, freedom of mobility to hospitals and any places that will give sense for females. Here, they justified that those of women who have a great say in the households decision making and are able to justify for every activities they do in the household will have a higher number of infants who have higher nutritional status relative to those if women have less empowerment indices in the household.

Using Young lives survey a Study by Alemu et al.(2003) on Ethiopian children nutrition status emphasised that child malnutrition as highest epidemic problem. They included household economic status measured interms of wealth and income expenditure of the household, shocks such as drought, employment status of women, sex of child under the survey, age of the child under the survey, household education and access to sanitation and health services as basic determinants of child nutritional status in the household. According to them sex of child, wealth quintile of the

household head, place of residence, educational back ground of mothers/care takers, age of child and other sanitation services played a greater role in contributing towards child nutritional improvement. But the one thing that had been postulated by them is that the employment status of mothers may not have that much significant effect on the improvement of their children nutrition as supported by the literature as well.

2.3.3 Empirical Evidence from Ethiopia

Most studies conducted in Ethiopia infer that though level of child malnutrition seems in reduction trend, still the problem needs much concentration from the country's prior agenda in fulfilling the millennium development goals.

Kibret(2013) ,using EDHS 2011 data and logistic regressions on Ethiopian children nutrition condition indicate that place of residence, mother's education, age of child, birth interval, sex of child, number of children and household economic status are found to be important determinants of child malnutrition. Similarly, the result on chronic energy deficiency of women analysis indicate that place of residence, age of women, women' decision making status in the household, marital status of women and household economic status are found to be key drives of women's status in a household and hence manifestation to show either thinness or vice versa in women.

According to GMR (2012), using EDHS 2011 data, in Ethiopia 40 percent of children in the wealthiest quintile are stunted. This deduces that in the context of Ethiopia availability of foods and dietary intakes is not the only problem rather there is also huge gap among those individuals who are the primary care takers for their children.

Alemu et al.(2005) using young lives data revealed that in Ethiopia the role of maternal caring practices played a greater role in ensuring child nutrition security. According to them, Caregiver's/mother's characteristics and marital status,

employment status of the caregiver, household wealth/assets, Community characteristics like access to water and sanitation services plays a greater role in ensuring nutritional status of children in both rural and urban areas of the country.

The quantitative results indicate that Young Lives children in rural areas were more likely to be stunted than those in urban areas. However, Young Lives children in urban areas were more likely to be malnourished compared with those in rural areas, controlling for all other factors. This result was surprising given that international literature suggests that the nutritional status of urban children is usually better.

Woldemariam and Timotiows (2002) using EDHS 2000 survey; they conclude that maternal nutrition status, economic status of households, women's employment for cash, marital status of a woman and related factors played crucial role in improving malnutrition of children specially below the age of five malnourished children in Ethiopia.

Genebo and Girma(2002) using EDHS 2000 and logistic regression models separately for urban, rural and all (urban and rural) children identified region of residence, education of mother, economic status of the household, number of antenatal care visit for mother and age of the child as determinants of stunting among urban children. For rural children, the analyses showed that region of residence, education of mother, education of mother's partner, age, birth order and preceding birth interval of the child as important predictors of nutrition status of children.

Genebo et al.(1999) and Yimer(2000) after controlling for household economic status, which is an important predictor of child nutritional status, they have showed that parental education has a positive and significant effect on child nutrition. They have shown that parental (specially women's education) is associated with more efficient management of limited household resources, greater utilization of available health care

services, better health promoting behaviors, lower fertility and more child-centred caring practices, all factors associated with better child health and nutrition.

Household economic status is positively related with child stunting in Ethiopia. According to the study, compared with children residing in medium/higher economic status households, the risk of being stunted for children in very poor or poor households were significant. This indicates the association of household economic status with household food security that is a prerequisite for access to adequate dietary intake for all members of the household in general and for children in particular. Small-scale studies undertaken in Ethiopia have also shown the importance of household economic status to improve stunting in children.

Other studies also report similar results from female's education (SCUK, 2002; Woldemariam & Timotiows, 2002; Alemu et al., 2005b; Silva, 2005). For example, using Woreda level data on children under age of 24 months, SC-UK (2002) confirmed that children whose mothers attended school were less likely to be malnourished than the children of uneducated mothers.

More importantly, Michael (2006), using EDHS 2000, showed that in the Ethiopian case mothers' education is significantly associated with child malnutrition. Here, he also postulated there was difference among urban and rural residential for child nutrition in which the latter suffer from more malnutrition circumstances associated with many socio economic and demographic factors of their care givers.

Nevertheless, there are some studies which could not find a significant relationship between female's education and child nutritional status, though having the expected positive sign (e.g. Sentayehu, 1994). Various reasons could be attached to this result. According to SCUK (2002), for instance, this could be because, although educating mothers (and other care givers) better will undoubtedly lead to an improvement in the

way some young children are cared for, many mothers will never be able to act on their new knowledge because they are simply poor. This means that poverty could cause bottlenecks, not allowing other public policies to influence child health (Attansio et al., 2005).

Alemu et al.(2005) found that maternal health, both pre- and post-partum, is considered to be very important in decreasing the likelihood of child malnutrition. Bilisuma (2004) also found age and health status of the mother to be significant determinants of height-for-age of children, but with a negative sign. Similarly, Alemu et al. (2005) found children of older mothers to be more wasted in rural areas.

CHAPTER THREE

3. Data and Research Methodology

3.1 Data Source

The study uses the 2011 Ethiopian Demographic and Healthy survey which is nationally representative and appropriate for examining nationwide trends and patterns in child malnutrition and how it correlates with women's status.

The 2011 Ethiopia Demographic and Health Survey data was part of the worldwide measure DHS project which was funded by the United States Agency for International Development (USAID) and implemented by the Ethiopian Central Statistical Agency (CSA).

The sample for the 2011 EDHS was designed to provide population and health indicators at the national (urban and rural) and regional levels. The sample design allowed for each of Ethiopia's 11 geographic/administrative regions (the nine regional states and two city administrations).The 2007 Population and census survey sample design used as a benchmark so as to run sample design for 2011 EDHS.

The 2011 EDHS sample was selected using a stratified, two-stage cluster design and EAs were the sampling units for the first stage. The sample included 624 EAs, 187 in urban areas and 437 in rural areas. A representative sample of 17,817 households was selected for the 2011 EDHS but only 16,702 sample respondents have been included during the final survey report. A total of 11,654 children who are below the age of five have been included in a survey as well. However, of this total, we have only used a total of 8,067 Children for our study after deleting missing observations and those of observations which have outlier values.

Among these level respondents only 1244 were from urban areas where as the remaining 6823 balanced for rural counter parts.

3.2 Research Methodology

3.2.1 Theoretical Framework

To formalize the relationship between child nutrition and women's status, the theory of household production function serves as a useful starting point. Households use human capital and other goods as inputs to produce a final good which is health (Rosenzweig and Schultz, 1983; Behrman and Deolalikar, 1988). This model is modified to include women's characteristics and their relative status to study the impact on child Nutrition.

$U = U(C, l, N)$…… (1)

Where U is the utility function, C is the consumption of goods and services l is the amount of leisure time and N is the nutritional health status of a child.

The nutritional status of the child is given by the production function

N = N(C, I, k, m, h)…….. (2)

C is the consumption of goods and services by households under consideration, **I** is inputs into child health such as medical care, **k** is the child's observable characteristics including age, birth order, size at birth and sex; **m** is a vector of maternal characteristics such as maternal education, mother's height, employment, decision making ,domestic violence, age at first marriage, **h** denotes household characteristics which include household wealth, sex of household head, age of household head and geographical location.

The budget constraint for the household is

$\sum_{i=1}^{T} P_i X_i = M$ ……(3)

Where $\boldsymbol{P_i}$ is the price of the ith commodity is, $\boldsymbol{X_i}$ is the complete set of commodities consumed including **C** and $\boldsymbol{l}$, **M** is the total money income.

Constrained optimization of the utility function subject to the budget, time and the nutrition production function constraints gives reduced form demand functions for the purchased goods and the nutritional status of children.

H=β(p,M,k,m,h)……..(4)

Where the particular functional form of the function **β (.)** depends on the underlying function characterizing household preferences and the nutrition production function

This final equation presented above allows for health demand which in turn reflects child nutritional status to be expressed as a function of the right side variables all of which are exogenous independent variables of the model.

In this study, a child's nutritional status as measured by anthropometric indicators is the dependent variable and the explanatory variables include maternal status, maternal endowments, child characteristics and household socioeconomic characteristics.

Anthropometric analysis

Anthropometry is a technique that uses human body measurements to draw conclusion about the nutritional status of individuals and population. Anthropometry is more often applied to pre-school children below the age of 5 years. To carry out anthropometric analysis, several variables such as child's age, sex, height and weight of children have been used. These measurements are used in generating indices such as, height-for-age, weigh-for-age and weight-for-height.

The indices generated compared with standard reference values of the World Health Organization (WHO) to obtain the Z-scores. Specifically the height-for-age Z-score, for example will be given as: **Z = X- μ/σ** Where let for example X is the child's

height-for-age, μ is the median height-for-age of the reference population of children of the same age and sex group, σ is the standard deviation of the reference population. The same is true for weigh-for-age and weight-for-height measures.

From the z-scores, the nutritional statuses of children have been determined. For this study, only two indices of malnutrition among all the sampled children have been determined. These are stunting and underweight. We leave wasting as it is a short term malnutrition condition and which has no that much significance. Stunting refers to a low height-for-age. Children whose height-for-age Z-score is below ─2 standard deviation from the median of the reference population classified as stunted.

Children having weight-for-age Z-score less than minus 2 standard deviation from the median of the reference population are regarded as underweight. Wasting is commonly used in emergency situation to assess nutritional deficiency when the age of the child is not known and children with weight-for-height Z-score that are less than ─2 standard deviation from the median of the reference population are classified as wasted.

3.2.2 Empirical Model

For the purpose of analyzing the roles of women's status on child nutrition, we specified a child malnutrition model represented as:

$$Y = \beta_0 + \beta_1 WS + \beta_2 HH + \beta_3 M + \beta_4 K + \beta_5 CC + e \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Where;

- **β**s -are parameters to be estimated
- **Y -**is a vector of dependent variables consisting of the prevalence of stunting and underweight
- **WS-** women's status indicator variables

- **HH-** is a vector of household characteristics such as wealth quintile that the household belongs to and geographical region
- **M-** is a vector of maternal endowment variables such as height and age at first marriage similarly
- **K**-is a vector of child characteristics such as age and sex
- **CC-** is Community level variables and **e** is the error term.

Description of the variables

1. Dependent variables

The standardized anthropometric indicators including height-for-age (HAZ) and weight-for-age (WAZ) commonly expressed as standard Z-scores have been taken as dependent variables for the reduced-form child nutrition models. HAZ, a measure of stunting, is an indicator of long-term nutritional status of a child. Finally, WAZ is a composite measure that incorporates aspects of both stunting and wasting. Here, we are not interested to include wasting as our nutritional status measurement because of the fact that it infers only short term malnutrition condition and also as underweight can include both wasting and stunting as a combined indicator, we leave wasting from measuring the nutritional status of children for our case. Here, we are not saying that wasting as a measure of child malnutrition is not important rather we just claim that it has no that much problem in our study if we leave it out.

The dependent variables take a dummy variable in which those of children whose nutritional status either interms of Stunting or underweight and whose Z-score below -2 SD regarded as stunted or underweight and those of children whose Z-score value have above -2 SD from the WHO standard regarded as not malnourished and will take the value 1 for malnourished and 0 for not malnourished Children. Hence a dummy variable of 0 and 1 are included for our dependent variable case.

2. Independent variables

In this category primarily the study concentrated on women status/empowerment indicators as its sole explanatory variables. In addition, characteristics of the individual child, the household and the community have been also included.

I. Women status indicators

According to many scholars and researchers the term women status may be defined from different angles or perspectives and this study employs the following measures as women status indicator tools. Here, we use the following variables as women empowerment indicator variables in which their status relatively inferred from.

A. Maternal Education

This is based on educational back ground of mothers as no education, primary education, secondary and higher education as categorical variables. It has been assumed to have a direct link to child nutrition through better child care practices and resource allocation in the household.

B. Maternal height

This term included to capture both the genetic effects and effects resulting from family background characteristics that are not picked by the education level. It is also taken to capture the quantity and quality of investments made in the mother's nutrition and health early in her life. This variable enters the nutrition outcome model in a linear manner.

C. Mothers' employment status

This includes whether the woman was employed either during the survey or in the past one year before the survey. Women's employment status expected to have both negative as well as positive effects on child nutrition. Because of mother's employment a child may be advantageous given that a woman she spent her income

that generated from employment on child feeding or any care practices. On the other hand a child's nutrition may be also damaged if a woman gives less time to care for her child due to employment. This explanatory variable takes a value of 0 for those unemployed and 1 for employed ones as a dummy variable.

D. **Decision making role of Women**

Here, the role of mothers' decision making habit on a certain activities like on her own health care, visit to relatives, large household purchase, in what things to spend her spouse/parental income in the household included. The more a woman participates on decision making in the house hold, the higher the nutritional status of children will be. The main thing that makes this explanatory variable here is that the concept of principal component analysis as a factor analysis method have been initially incorporated before aggregating the whole women status indicator variable in to additive concept. Hence, after adjusting component loading for each factor like health care participation, large household purchase and etc, we added the whole values and give 0 and 1 dummy for the cumulative decision index in which high participation in decision holds for positive values and low participation indecision holds for negative values assigned for dummy of zero.

E. Attitude towards domestic violence

In this respect, the Woman's attitude towards a certain violence activities in the household like towards sexual activity, neglecting her children's, and related others included. For such aspects, women's justification for violence by her spouse included. Those of mothers who have a greater justification for being violated by their partners will have a child with improved nutritional status where as the reverse case may infer less nutritional status. For this index, like that of decision making index we have incorporated the concept of Principal component analysis and assigned for dummy of

1 and 0 for those who justifies and unable to justify for being violated by their partners respectively.

F. Age differential with her spouse

This entails the age gap among a woman and her husband. The higher the number of years her husband has relative to his wife has, the higher the age gap will be. This will take a dummy variable of 0 and 1 in which those of mothers who have a less age relative to her husband may entail less nutritionally improved children. This may be due to the fact that those of care takers or mothers may not have high say in their household due to assumption that older man may control all the assets in the household as traditionally claimed.

G**. Educational difference with her husband**

This includes the educational attainment gap between a woman and her partner/husband. It measures the gap interms of dummy variables in which whenever educational attainment among the two partners is negative it assigns 0 dummy for mother and positive for her husband it assign 1. The higher the educational gap between them is the less power will be given to mother and it will decrease the nutritional status of her child and vice versa.

II. Individual child variables

Principally the entire objective of this study is to show the role of women's status in improving their child nutrition security using anthropometric measures as dependent variable. So that, we are interested to use individual child characteristics variables like age, sex, size of child at birth and related variables during the survey have been included. In order to make their child characteristics clear for our study we use child sex as a dummy variable taking 0 and 1 for those of females which take 0 and males as dummy of 1.

III. Household level variables

Among different sets of household variables in the survey, we are interested to concentrate on household composition, economic status of households (taking categorical out comes), sex of household head, age of household head included, place of residence, region of residence, and related others have been incorporated.

IV. Community level variables

The variables represent the overall availability of services such as source of drinking water and type of toilet household use.

3.2.3 Method of Data Analysis

Both Bivariate (Chi-squared test) and Multivariate regressions (Robust OLS) have been employed. We use Chi-squared test simply to show a significance association among dependent variables (here in our case stunting and underweight) and explanatory variables. Robust OLS regressions have been used to solve problems regarding heteroscedasticity. In addition, Principal component Analysis have been employed to construct indices for some explanatory variables such as maternal decision making index, attitude towards violence index, etc…

CHAPTER FOUR

4. Data Analysis and Interpretation

4.1 General Description of the Data

The data has been free from missed observations and outliers and hence a total of 8,067 observations are retained for the analysis. Of this total, 6,823 observations belong to rural areas while the balance refers to urban areas.

Though the EDHS (2011) big survey included 11,654 sample children, for our analysis we have only used 8,067 children with a total of 4,124(51.12 percent) males and 3,943(48.88 percent) females.

4.1.1 Demographic Characteristics of Respondents

Our sample basically includes information on children and their mothers. From the total children sample more than 50 percent (51.12) of them are male where as the balance holds for females. As indicated in table 4.1 below, most Ethiopian Childs during their birth day infers a smaller level of size in which they accounted for more than 65 percent of the children under the survey were small. This may result in a deterioration of their nutrition with the transmission of intergenerational malnutrition problem with a burden may be high for those off springs with a smaller size relative to the larger sized children.

In this sample, 95 percent of the mothers are either uneducated or have not studied beyond the primary level. Only 5 percent of the mothers have received schooling either secondary or higher education. The average height for women was 157.43 centimetres (cms), but 11.73 percent of the mothers had a height below 145 cms, a

cut-off for obstetric risk as defined by WHO. The mean age at first birth is 18.84 years, and 51.06 percent of the women were come up with their own off springs before the age 15.

The decision making index shows that, on average, women are generally involved in 63.05 percent of the household decisions related to expenditures for daily needs or large purchases, visits to family, and their own and their child's health. Finally, we use the wealth index available in the EDHS to divide the sample into household wealth quintiles.

Concerning households attributes, as inferred from table 4.1 below, most of household members have been headed by male headed households with a total share of 86.36 percentages where as the remaining portion of households have been laid by female headed households with a total share of 13.64 percentages. From this figure we can conclude that in the Ethiopian case most of households have been laid by male headed households. What interests us in this sphere here is that according to the literature as women are the primary care takers of households relative to men and they mostly invest in child nutrition, those of households whether headed by females or males may not have any significant difference in determining child nutrition and would be accompanied by econometrics approaches latter.

As shown from table 4.1, most of the respondents have around 6 household members relative to the total sample share in which the largest sample have been taken from Oromiya region with a total sample share of 16.23 followed by SNNP having a total sample share of 14.62. In contrast the smallest sample shares have been laid down by Addis Ababa City Administration with a share of only 3.2 percentages. Interms of Addis Ababa city administration the sample proportion relative to the original data of 11,654 children, it shows a great sample size reduction during deleting of missing

observations and outliers. But we have used the final data that have been managed and try to see the status of every variables aspect related to the theoretical back ground of the topic whatever the sample size in each region come up with.

Table 4.1: Demographic characteristics of respondents

Description of variables		N	Mean	S.d	Min	Max	Description
CHILD ATTRIBUTES							
Sex of child							Binary 0,1
	Male	4,124	51.12				
	Female	3,943	48.88				
Age in Months		8,067	30.2	17.14	0	59	continuous
Size at Birth							categorical; 1-5
	very small	1,755	22				
	smaller than average	736	9				
	Average	3,180	39.5				
	Larger than average	993	12.3				
	Very large	1,383	17.1				
WOMEN ATTRIBUTES							
Highest level of education							categorical-3
	no education	5,661	70.17				
	Primary	2,014	24.97				
	Secondary	251	3.11				
	Higher	141	1.75				
Age of Women in Groups							categorical 1-7
	between 15-19	308	3.82				
	between 20-24	1,574	19.51				
	between 25-29	2,576	31.93				
	between 30-34	1,662	20.6				
	between 35-39	1,268	15.72				
	between 40-44	504	6.25				
	between 45-49	175	2.17				
Women employment							Binary 0,1
	Employed	4,460	55.29				
	Not employed	3607	44.71				
Height		8,067	157.4	6.49	87.2	196.2	continuous
Marital Status							Binary 0,1
	Married	7,637					
	Living with partner	430					
Age at first marriage	Birth	8,067	18.84	3.6	10	38	continuous
Body Mass Index(BMI)		8,067	20.31	33.35	12.56	99.98	continuous
Continued							
Participation in Decision making							Binary 0,1

	Participate	5,086	63.05				
	Not participate at all	2,982	36.95				
Attitude towards violence							Binary 0,1
	Justified	4810	59.63				
	Not justified at all	3,257	40.37				
HOUSEHOLD ATTRIBUTES							
Sex of household Head							Binary 0,1
	Male	6,967	86.36				
	Female	1,100	13.64				
Place of Residence							Binary 0,1
	Urban	1,244	15.42				
	Rural	6,823	84.58				
Household composition		8067	6.2	2.29	2	22	continuous
Region of residence							categorical 1-11
	Tigray	868	10.76				
	Afar	794	9.84				
	Amhara	852	10.56				
	Oomiya	1,309	16.23				
	Somali	627	7.77				
	B.Gumuz	698	8.65				
	SNNP	1,179	14.62				
	Gambella	556	6.89				
	Harari	437	5.42				
	Addis Abab	258	3.2				
	Dire Dawa	489	6.06				
Partner's education							Categorical l-3
	Noeducation	4,203	52.1				
	Primary	3,033	37.6				
	Secondary	495	6.14				
	Higher	336	4.17				
Wealth Index							categorical 1-5
	Poorest	2,492	30.89				
	Poorer	1,502	18.62				
	Middle	1,353	16.77				
	Richer	1,333	16.52				
	Richest	1,387	17.19				
Source of Drinking water							categorical 1-3
	Piped	3459	43				
	Open well	2808	35				
	Surface water	1800	22				
Type of Toilet facility							categorical 0-2
	Flash Toilet	204	2.73				
	Pit Toilet	3,733	46.27				
	No Toilet	4,130	51				

4.1.2 Basic Women Status Indicator Variables

As shown from table 4.2 below, women have a great role in saying households' decision regarding women's decision to visit families or relatives with a great participation which accounts 72.83 percent followed by women's decision regarding their own health care, women's saying how to spend or what to do with her spouse or partner's earnings and women's involvement via large household purchases which accounts 70.82,67.64 and 61.93 percentages respectively compared to the total samples under consideration.

As depicted in the table, here women's highly integrate towards such basic activities as a household decision maker, it will highly result in freedom for women and hence they will do what they want to do and finally as a care takers they can feed and have a greater knowledge for their infants. Concerning the EDHS data women's involvement in visiting their relatives and greater saying regarding their own health care will play a tremendous effect in improving their child nutrition as keeping health of mothers will indirectly resulting in improving child's health too. Whatever the case and whomever will decide up on mothers health care, household purchases and visit to her relatives, the one which entails towards keeping mothers safe resulted in child nutrition development.

With regard to women's attitude towards domestic violence, when ever women have greater justifications or have a reasonable way of expression for what her actions or reasons for violence, it will have a more partial effect on her child nutrition with a greater nutritional child will be avail with in the household where women's attitude towards violence is high. For example as shown from the table below, almost more than 50 percent of mothers have a greater saying regarding why they do not inform for their spouses whenever they leave home, neglects their own children and argues with

spouse himself. The odd thing here is that concerning why they refuse to have sex with their husband who accounts only 48.37 percentages of women have some saying regarding attitudes towards violence. The main secret with this minimal number compared to other violence attitude variables may be is that as women most of the time are not interested they may become shy to inform the reasons to the data collectors during the survey.

In addition, from the table we can infer that compared to their partners/husbands, a woman tends to have a lower educational background and a slightly higher age differential with her husband. This may be due to the fact that mostly in developing countries like Ethiopia, women are highly exposed to early marriages as well. Almost 94 percentages of women are below the age of their husband with a further apart age also considered in rural parts of the country. This may resulted in exposing woman towards violence by her husband as well as the manifestation of inferiority due to high age gap among the two partners as well.

Above all, whether a woman is less educated relative to her husband or possesses extreme age gap among her husband may be one manifestation of what our concern here is that child malnutrition. As discussed above, women are primary care takers to their children in which they mostly invest in child nutrition relative to men, but the main problem with this aspect is that high gap among age as well as educational attainment may result in malnutrition at all because as specified women invest more on child relative to their husbands.

Most importantly a study by Quisumbing et al. (2012) using Bangladesh DHS data confirms with this situation. They also acknowledge that women who do not condone domestic violence have a slightly higher age at marriage and belong to a higher wealth quintile.

Table 4.2: Basic Women status measurement variables

Women's status measurement	Percent
Percentage respondents who have some say in making decisions (alone or with husband/partner or other person)	
On large household purchases	61.93
Own health care	70.82
Visits to family or relatives	72.83
What to do with husband's earnings	67.64
Percentage of respondents who justified domestic violence	
Wife beating justified if	
Goes out without telling husband	52.97
Neglects children	59.22
Argues with him	54.64
Refuses to have sex with him	48.37
Educational difference with her husband	30.02
Age differential with her husband	5.80

Source: own computation from EDHS 2011 data

From the above table, we can infered that in the Ethiopia case only 30.02 percent of women are at least equally educated relative to their spouses. Surprisingly, only 5.80 percent of women are at least equal in age with their spouses. Hence, this showed that most Ethiopian women are suffering from early marriage and hence this will decrease their power in a household.

4.1.3 Distribution of Child Malnutrition by Region of Residence

The data set shows that child malnutrition rate in Ethiopia is very high relative to the WHO standard. Stunting which refers to long term growth retardation affected a significant proportion of children below the age of five. As shown from table 4.3 of the total children in the study, nearly one-half of them (46 percent) are stunted;

similarly the prevalence of underweight is very high in which 31 percent of them are underweight. There is also a considerable variation among rural and urban parts of the country interms of both children stunting and underweight in which the highest level of stunting as well as underweight prevails in rural parts of the country. This may be attributed towards many factors like urban households may have greater know how regarding child nutrition as well as any related aspects compared to the rural counter parts.

Moreover, the prevalence of child malnutrition shows variation among region of residence. Among the total regions, Amhara region infers the highest level of child stunting with a percentage of 53.2 followed by Tigray and Afar with a value of 52 and 49.5 percent. In contrast the lowest stunting and underweight prevalence outcome registered to the two city administrations in which as it was expected urban areas have highest level of child nutrition than that of rural counter parts.

Concerning child malnutrition with underweight as a basic dependent variable, it can be dedicated that the highest level of underweight registered for Afar with a percentage of 43.34 followed by Benishangul Gumuz having a percentage of 43 from the given sample within the region. What our concern here is that what matters the difference here either interms of child stunting or underweight is the basic research question from the beginning. Regional as well as place of residence differential interms of basic child anthropometric measures may be due to difference in abundance of resources for child caring activities, knowledge gap among societies interms of child feeding mechanism interms of supplying basic food stuffs for their infants, prevalence of natural hazards like drought in some parts of the country like Afar, Somali and some part of Tigray region may have a great effect interms of agricultural

outputs and hence on child nutrition as most of the societies in Ethiopia depends on Agrarian way of life.

From the total respondents for this study considering women's as well as other general demographic characteristics of the respondents, we can infer that children whose mother live in areas like Afar and Benishangul Gumuz shows substantially higher level of child malnutrition interms of underweight may be in a bad condition either from the perspectives of relative status in the house hold or any other demographic and maternal endowments variables as have been expected.

The prevalence of underweight in rural areas is almost twice larger than that of urban parts of the country in which 32.5 percent of rural children are underweight in contrast to 19.75 percent of urban children.

Table 4.3: Distribution of Child stunting& Underweight by Place of Residence

Place of Residence	Stunting	Underweight
Urban	33.5	19.75
Rural	49	32.5

Table 4.4: Distribution of Child stunting& Underweight by Region of Residence

Region of Residence	Stunting prevalence	Underweight Prevalence
Tigray	52	34
Afar	49.5	43.34
Amhara	53.2	35
Oromiya	43	29
Somali	37	33.52
Benishangul Gumuz	46	43
SNNP	47	30.25
Gambella	33.4	26
Harari	32	22.54
Addis Ababa	23	7.53
Dire Dawa	28	19.75
National Total	46	31

Source: own computation from EDHS 2011 data

4.1.4 Distribution of Child Malnutrition by Socioeconomic and Demographic Characteristics

This section shows the distribution of stunting and underweight interms of socio economic and demographic characterstics of respondents. It principally inferred from maternal characterstics as a measure of women status indicators as explained in the literature, maternal endowments, child characterstics and related others of household characterstics and community variables like source of drinking water and type of toilet facility household use as sanitation services.

As have been already observed in table 4.1 earlier, mother's education level is low. Table 4.5 below also infers the overall role of mother's education for child nutrition in Ethiopia and more malnourished children observed in which those of children whose mother did not attend any education. This shows that the lowest level of child nutrition status with approximately 48.3 percents of children is stunted and 37 percent of them are also underweight. Where as those of children whose mother have at least attend primary level of education shows relatively better level of nutrition with 42.7,22.43 and 19.2 level of stunting for primary, secondary and higher level of education respectively. The same trend is observed to that of underweight child malnutrition interms of mother's education in which those of children whose mother have no any education inferred the higher level of underweight where as those of having educated mother have a less level of underweight.

The interesting result in our study is that concerning the role of women's participation in household decision making in which those of children whose mother have a greater saying in any decision shows a relatively higher level of child nutrition. From table 4.5, we can observe that those of children whose mother have a greater saying interms household decision making shows the least level of stunting with a percentage of 38

relative those of whose mother did not participate in decision making which has 43.6 percent stunted children from the total sample.

Women's attitude towards domestic violence also showed a variation among different level of child malnutrition in which those of mothers who have a greater justification for violence in terms of woman's justification. This may be due to the fact that whenever a woman leaves her home without informing to her partner, she may be also engaged in some productive or non productive activities but in one way or in the other way it may be a source for feeding her child. This situation also confirms a study by Quisumbing et al. (2012) on Bangladesh in which they observed that those of woman who have a high justification for their violence specifically when leaving their home increase the nutritional status of their infants specifically under the age of five.

Although some literatures and studies confirmed that those of children who have an employed mother have a relatively better nutritional status our result in table 4.5 inferred that those of women who are employed either during the survey or one year before the survey had 46.2 percentage of their children stunted in which those of unemployed mothers have a little bit lower level of stunted children with a percentage of 43.4. The same trend is also true for underweight in which those of children whose mother are unemployed showed relatively lower level of malnutrition where as employed mothers have a higher level of underweight children. The basic pillar from this descriptive argument is that those of women who are employed may give less caring activities for their infants as they may be busy with works where as those of unemployed mothers may spent most of their time in watching for their children. Though employed mothers may get income and will give variety of diets for their infants, these may be outweighed by other maternal care taker activities by unemployed women.

Sex of household head shows a little bit variation interms of child malnutrition in which those of households headed by females have a greater level of stunted (44.3 percent) where as those of male headed household members have a little bit lower level of stunted children(42.3) relative to female headed household ones. This may be due to the fact that mostly female headed households in Ethiopia have no different income generating activities like that of male headed households in which male headed ones get different income sources and they will invest on their children. But this is not a big deal difference like that of expectations because females may also invest on their infants and may improve their child nutrition status with different income sources as well. Unlike that of more stunted children because of female headed households, in the case of underweight those of children who are from female headed households show relatively better level of nutrition with 35.2 percents of children among the sample are underweight.

Access to drinking water and toilet facilities capture households community variables. As compared to households who drink piped water, those households who get their water source from open well and surface waters have a greater level of stunted as well as underweighted children. From the total child sample in this study, only 29.4 percent of children from pure water access households are stunted where as those of open well and surface water usage households have 46 and 31.5 percentage of stunted children. The same exercise also holds for that of underweight in which those of households from piped water source have only 17 percent of underweight children where as those from surface communities have about 33.4 underweighted children.

Like that of drinking water, toilet facilities also play a great role in child nutrition. As can be inferred from table 4.5, those of households who have access to either Flash or Pit toilet, the nutritional status of their children interms of stunting and underweight is

improved and the opposite is true for those of households who are without any toilet facilities.

Wealth quintile a given household grouped does not show that much different trend interms of child malnutrition though some basic differences observed from the statistics there. From the total wealth quintiles, those of households from the poorest shows highest level of stunted as well as underweight with a percentage of 51 and 36.7 respectively where as relatively those of from richest quintile inferred 36.4 and 16 level of stunted and underweight respectively as well.

Size of child at birth showed variation among level of stunting as well as underweight in which those of children who were born very large showed lower level of stunting and underweight where as those of who born at smaller size had bad nutrition in which off springs may become worse off during birth because of intergenerational mother to child poverty transmission.

An interesting result that we have to observe from this study here is that the malnutrition level of children below the age of five among different child age groups. Basically those of children who are at the lower age level had a lower level of stunting as well as underweight in which literatures previously also confirmed this situation specifically concerning to stunting.

Like that of mothers education partner's education also showed variation among child nutrition status in which those of children who are from at least primary level educated partner have a higher a lower level of stunting where as those of from uneducated partners background had bad nutrition for both stunting as well as underweight case though the rate is high in the sphere of stunting.

Although different previous studies and literatures acknowledge that those of female Children are mostly superior over male Childs interms of nutrition, from table (4.5) we

observe that sex of a child does not show any difference among the child sexes though females are less stunted as well as less underweight relative to males. Here, among the total sample, 47.45 percentages of males and 46.34 percentages of females are stunted.

Table 4.5 Distribution of Child Malnutrition by Socioeconomic and Demographic Characteristics

Socio Economic and Demographic characterstics	Percent stunted	Percent underweight
Mothers education		
No education	48.3	37
primary education	42.7	29.6
secondary education	22.43	17
higher education	19.2	8.4
Mothers Decision making		
Not participate	43.6	31.5
Participate	38	22.7
Mothers attitude towards Violence		
Not able to justify	43	27.35
Able to justify	36.5	24.64
Women employment status		
Not employed	43.4	37.3
Employed	46.2	41
Sex of household head		
Male	42.3	38.67
Female	44.3	35.2
source of drinking water		
Piped water	29.4	17
Open well	46	25.6
Surface water	31.5	33.4
Type of Toilet facility		
Flush Toilet	13.4	9.45
Pit Toilet	32.43	19.4
No Toilet at all	45	29.5
Wealth Index of Households		
Poorest	51	36.7
Poorer	46	34.3
Middle	41.5	28
Richer	37	25
Richest	36.4	19

Size of child at birth			
	Very small	43.4	46
	Smaller than average	41	40
	Average	36.6	36
	Larger than average	29	34
	Very large	27.5	18
Age of Child in groups			
	Less than 6 months	11	7.5
	≥6 and < 12 months	27.34	31
	≥12 and < 24 months	53.4	53
	≥24 and < 36 months	49	49
	≥36 and < 48 months	54	47
	≥48 and < 60 months	51	46.4
Partner's education			
	No education	43	42
	primary education	42.5	37
	secondary education	26	27.5
	higher education	15.3	18.4
Sex of Child			
	Male	47.45	35.6
	Female	46.34	36.7

Source: own computation from EDHS 2011 data

Finally, from the above table we can conclude that woman's educational background, decision making role of women as well as their attitude towards violence, source of drinking water and sanitation services like toilet, size of child during birth and partner's education shows a considerable variation among different key variables with emphasis to child nutrition. Whereas the influence of wealth quintile households are grouped in, sex of child and sex of household head though show variation among child nutrition it is not as such expected from different literatures and studies.

4.2 Econometric Estimation

4.2.1 Bivariate Analysis of the Data

To show the relation among child malnutrition condition (which is the dependent variable) and explanatory variables like women status indicator variables, household

characterstics, child characterstics and related community variables, Chi Square test is performed on categorical socioeconomic and demographic household characteristics.

This Bivariate analysis which is based on chi-square as shown in table 4.6 below infers there is a significant association between child malnutrition specifically stunting and the majority of household characteristics in both rural and urban areas of the country.

For the rural sample mothers' education, attitude towards violence, community variables like source of drinking water and type of toilet facility, partner education and age of child infers a highest association with child nutritional status where as that of employment status of mothers, sex of household head, and sex of a child for which no significant association with stunting is observed.

For the case of urban households, except that of household head sex, size of child at birth and sex of child the remaining variables show significant association with child nutritional status.

For both rural and urban households we can conclude that there is a significant association among child nutrition and that of women education, decision making as well as mothers' attitude towards a certain violence activity, child age and that of partner's education with a higher chi-square test implying greater determination of the variable in determining child nutritional status.

Table 4.6 Child stunting by socioeconomic and demographic characteristics in rural and urban areas and Chi Square test of significance

	Rural		Urban	
Socio Economic and demographic characterstics	% stunted	chi-squ	% stunted	chi-squ
Mothers education				
No education	50.5	28.56***	35.6	35.43***
primary education	46		32	
secondary education	33.6		23.4	
higher education	18		15.5	
Mothers Decision making				
participate on decision making	37.4	23.5***	27	29.3***
not participate in decision making	45		36.7	
Mothers attitude towards Violence				
Justified for violence	39.5	19.7***	31.2	23.7***
Not able to justify	43		34.6	
Women employment status				
Not employed	44.7	1.6	25	2.56**
Employed	48		29	
Sex of household head				
Male	43.5	0.8	33	0.234
Female	45		31.7	
source of drinking water				
Piped water	31.6	13.5***	38.6	16.64**
Open well	48		24.5	
Surface water	34.3			
Type of Toilet facility				
Flush Toilet		6.34**	43	33.2**
Pit Toilet	35		25	
No Toilet at all	41		9.5	
Wealth Index of Households				
Poorest	52.5	5.57**	45	8.45**
Poorer	48		42	
Middle	42.5		36.3	
Richer	38		31	
Richest	37.9		28.3	
Size of child at birth				
Very small	44	1.45	36	1.25
Smaller than average	42.5		33.8	
Average	37.7		27	
Larger than average	31		27.5	
Very large	28.5		25	

Age of Child in groups				
Less than 6 months	13.5	114.7***	8.4	66.7**
≥6 and < 12 months	29		10.6	
≥12 and < 24 months	54		36	
≥24 and < 36 months	50		34.7	
≥36 and < 48 months	53.5		38	
≥48 and < 60 months	52.5		39.4	
Partner's education				
No education	44.7	24.34**	39.3	38.53***
primary education	43.8		37	
secondary education	27		19.7	
higher education	16.45		12.7	
Sex of Child				
Male	50.4	0.45	32	1.58
Female	49.6		33.5	

Note:***,**,* refer to 1,5 and 10 percent level of significance respectively
Source: own computation from EDHS 2011 data

In the case of underweight like that of stunting, household characteristics establish a significant association with nutritional status of children. In the rural sample, mothers' and their partners' education, wealth index of household decision making role, attitude towards violence, employment status of mothers, size of child at birth, wealth index of households and age of a child are the only ones that are significantly associated with being underweight.

In urban areas, on the other hand, household health environment captured by access to toilet facility and piped water, decision making and attitude towards violence, mothers' and their partners' education, wealth index of households and age of child have a significant association with underweight.

Above all, mother's education, partner's education, decision making role of mothers, mother's attitude towards violence and age of child are the only ones that are strongly associated with nutritional status of children in all cases.

Table 4.7 Child underweight by socioeconomic and demographic characteristics in rural and urban areas and Chi Square test of significance

Variables	Rural	chi-squ	Urban % under	chi-squ
Mothers education				
No education	46	27.32***	34.3	31.2***
primary education	39		29.6	
secondary education	32.5		24.7	
higher education	21		16.8	
Mothers Decision making				
participate on decision making	32	3.2**	23	12.5***
not participate in decision making	35.6		34.5	
Mothers attitude towards Violence				
Justified for violence	41	6.8**	30.4	7.4**
Not able to justify	45		36	
Women employment status				
Not employed	43.6	2.65**	22	1.63
Employed	46.7		24	
Sex of household head				
male	43	0.679	29	1.24
female	43.5		32	
source of drinking water				
Piped water	45	1.876	13	17.5***
Open well	41		26.8	
Surface water	38.4		15.2	
Type of Toilet facility				
Flush Toilet		1.47	35	21.4***
Pit Toilet	40.6		21	
No Toilet at all	42		8.6	
Wealth Index of Households				
Poorest	51	2.68**	39	3.76**
Poorer	46		35.7	
Middle	43.4		32.8	
Richer	37.3		29.6	
Richest	36.5		24.5	
Size of child at birth				
Very small	46	3.4**	34.6	5.6**
Smaller than average	43.6		31.5	
Average	42.5		24.3	

Larger than average	32		22	
Very large	29		19.5	
Age of Child in groups				
Less than 6 months	4	96.44**	2.7	45.7***
≥6 and < 12 months	16		9.4	
≥12 and < 24 months	28.5		26.4	
≥24 and < 36 months	25.6		23.6	
≥36 and < 48 months	22.4		18.5	
≥48 and < 60 months	19.5		15.4	
Partner's education				
No education	43	32.34**	33.6	41.3***
primary education	42.5		24.7	
secondary education	26.35		18.5	
higher education	15.3		11.2	
Sex of Child				
Male	46	0.53	30.7	1.47
Female	47.3		29.6	

Note:***,**,* refer to 1,5 and 10 percent level of significance respectively
Source: own computation from EDHS 2011 data

4.2.2 Multivariate Analysis

As indicated in table 4.8 below, the multivariate analysis for both stunting and underweight have been determined including urban as well as rural household samples individually.

According to the estimation results and tests for constant variance of the error terms, the test for heteroscedasticity infers that in the case of HAZ regression constant variance have been observed for urban samples only. But there is no constant variance either in case of WAZ or rural HAZ regressions at all.

In order to alleviate problems related with heteroscedasticity, heteroscedasticity robust regressions are estimated and the reported error variances are robust. On the other way, test for multicollinearity for the explanatory variables using pair wise correlation test shows that multicollinearity is not our problem.

4.2.2.1 The HAZ Regression

The estimation results of the HAZ regression in table 4.8 shows that maternal education, decision making, attitude towards violence, age of child, number of family members, wealth index of households, access to water and toilet facilities have significant effect on HAZ score in either of rural and urban regressions.

The wealth index which is an indicator of household economic status appears to have no significant effect on the HAZ score of a rural child. Conversely, wealth index has a significant and positive effect on the HAZ score of an urban child. Specifically, an improvement in the wealth index by just a unit brings 0.16 units improvement in the HAZ score of an urban child. Thus, as the economic status of urban households gets better, the nutritional status of a child improves.

Coming to women's status measurement explanatory variables like mothers educational level, mothers' decision making and mothers' attitude towards violence are significant predictors of child nutritional status.

As in the finding in Quisumbing et al. (2012), the multivariate analysis suggests that long term nutritional status of children is strongly associated with women's intra-household status measurement variables. In both rural and urban areas, there is a positive association between the index and the HAZ score of a child which implies an improvement in women's status improves nutritional status.

As it has been shown in the bivariate analysis, it was shown that mother' education, mothers decision making and mothers attitude towards violence as a significant association with stunting in which mothers decision making and justification violence played a great and controversial contribution for child nutrition as a whole.

When compared to a child whose mother attained a higher education (which is the base category), an urban child whose mother had no education or attained only Primary or secondary education level has a lower HAZ score. A child whose mother belongs to the base category has a HAZ score higher by approximately 0.34 units than a child whose mother had either no education or reached only a primary or secondary level education.

Furthermore, when compared to a child whose mother participates in decision making as well as have some power in justification for violence, those of Childs whose mothers did not have such indices incur lower level of HAZ score in both rural as well as urban sample regressions.

As it has been also observed in a bivariate regression, age of child has a much significant effect on child stunting in which those of children whose age is far apart from the base category (which is children below the age of 6 months) their HAZ score declines. This finding is in conformity with the expectation that the nutritional status of a child deteriorates as a child age increases. This could be a result of increased exposure to contaminated environment and contagious diseases as a child grows. Whereas sex of a child is found to have an insignificant effect on stunting and these conditions holds true regardless of whether a child is from a rural household or an urban household.

On the other hand, the rural regression shows that a child with uneducated mother has a lower HAZ score compared to a child in the base category although the HAZ score of a child whose mother attained a primary or secondary level education is not significantly different from that of a child in the base group. This positive association between mothers' education and nutritional status of children is in agreement with the

literature which underscores better educational status of mothers improves the nutritional status of their children through improving caring practices, facilitating interaction with health professionals, and enhancing health seeking behaviour.

Household access to clean water facility (piped water and protected well) have a significant effect on child nutritional status in which a child from a household having access to clean water services facility has a HAZ score higher by 0.13 units than a child in a household without access to the service.

The type of toilet facility a household has access is a significant determinant of child nutritional status but for an urban child only. A child from a household using toilet facility (either flush toilet or pit latrine) has a HAZ score higher by 0.24 units than a child from a household without access to any kind of toilet facility.

The coefficient on number of household members shows a positive and statistically significant association with the HAZ score of an urban child. This positive association may be an outcome of economies of scale in time for child care and expenditure as household size increases.

In general, the finding from HAZ regression infers that women's education, decision making role of women, justification and women's attitude towards violence have a significant positive effect on child nutritional status. It also shows that Wealth index of households, age of a child, number of household members and household health environment are significantly associated with height-for-age z-score of a child.

Table 4.8 Robust OLS Estimation Results for HAZ scores

	Rural			Urban		
Variables	Cof	sd.er	t-val	cof	sd.er	t-val
Mothers education						
No education	-0.12	0.087	-1.7*	-0.35	0.17	-3.23***
primary education	-0.09	0.074	-1.23	-0.34	0.16	-3.25***
secondary education	-0.09	0.063	-1.17	-0.34	0.18	-3.32***
Mothers Decision making	0.043	0.023	2.97***	0.053	0.21	3.4***
Mothers attitude towards Violence	0.027	0.015	2.14***	0.03	0.032	2.35***
Women employment status	-0.02	0.012	-0.53	-0.18	0.06	-1.3
Age difference with her husband	-0.01	0.07	-1.2	-0	0.001	-1.8
Sex of household head	0.03	0.052	0.51	0.002	0.068	0.0027
Partner's education						
No education	-0.13	0.087	-1.13	-0.36	0.13	0.02
primary education	-0.08	0.06	-1.03	0.021	0.11	-0.62
secondary education	-0.04	0.08	-0.07	0.01	0.03	-0.21
Sex of Child	0.002	0.03	0.012	-0.01	0.12	-0.11
Age of Child in groups						
≥6 and < 12 months	-1.1	0.07	-12.4***	-1.04	0.16	-2.3***
≥12 and < 24 months	-2.01	0.06	23.1***-	-2.15	0.14	-12.3***
≥24 and < 36 months	-2.03	0.065	-24.2***	-2.03	0.146	-12.8***
≥36 and < 48 months	-2.14	0.056	-25.1***	-2.21	0.13	-14.13***
≥48 and < 60 months	-2.06	0.061	-24.7***	-2.25	0.13	-14.27***
Number of household members	0.03	0.006	1.53	0.042	0.019	1.98*
Wealth index of households	0.045	0.03	1.18	0.16	0.047	2.78***
Access to toilet facility	0.035	0.06	0.42	0.16	0.13	1.86*
access to clean water	0.13	0.07	1.67*	-0.12	0.124	-1.03
Constant	0.24	0.22	1.04	0.25	0.28	1.9
Number ofobservations	6823	Number of observations		1244		
F(21,6801)	90.45	F(21,1222)		25.64		
Prob>F	0	Prob>F		0		
R-squared	0.173	R-squared		0.26		
Adjusted R-squared	0.17	Adjusted R-squared		0.23		

Note:***,**,* refer to 1,5 and 10 percent level of significance respectively

Source: own computation from EDHS 2011 data

4.2.2.2 The WAZ Regression

The WAZ estimation results in table 4.9 shows that mother education found to have a statistically significant and positive effect on the WAZ score of both a rural child and an urban child. When compared to a child whose mother attained a higher education (which is the base category), both urban and rural child whose mother had no education or attained only Primary or secondary education level has a lower WAZ score.

Like that of the HAZ regression, mothers decision making and justification for violence have a direct relationship with the nutritional status of children. For example, a child whose mother participate in decision making have 0.035 higher units of nutritional status than that of those whose mother do not participate in decision making. Hence, mothers' decision making roles as well as mothers' attitude towards violence have a significant role in child nutrition for both rural and urban children.

Unlike that of HAZ regression, women employment in rural WAZ regression has a significant effect on child nutrition in which those of children whose mother are employed can have 0.05 less nutritional status relative to those of children whose mother are unemployed either during the survey or one year before the survey. This confirms a study by Peter G. (2002) in which when a woman is employed specifically in rural parts, it will give less caring activities for her infants and this will deteriorate the nutritional status of children as a whole. Absence of substitute caretaker in place of mothers or the lack of capacity of the substitute caretaker to appropriately care might explain this adverse impact of mothers' employment.

Similar to the findings in the HAZ regression, a strong and statistically significant association is found between the WAZ score of a child and age group. Children in a higher age group show an inferior nutritional status as compared to those in the base

category. On the other hand, of the two indicators of household health environment, only access to toilet facility has a statistically significant association with weight-for age z-score for that of urban samples.

Interestingly, partners' education has a statistically significant effect on the WAZ score of a rural child. Children in households where partners were highly educated (having higher education) have a higher weight-for-age z-score compared to children in the other categories.

In sum, mother education, mother employment, mother decision making and attitude towards violence are strongly associated with underweight. Also, age of a child, wealth index, partners' education, and access to toilet facility affect the WAZ score of a child.

Table 4.9 Robust OLS estimation results for WAZ scores

Variables		Rural			Urban		
		Coeff	sd.err	t-values	coeff	sd.err	t-values
Mothers education							
	No education	-0.24	0.13	-2.5***	-0.31	0.07	-2.43***
	primary education	-0.15	0.06	-2.21***	0.027	0.18	-2.14***
	secondary education	-0.06	0.03	-1.96***	0.024	0.14	-2.01***
Mothers Decision making		0.035	0.021	2.4***	0.045	0.18	3.2***
Mothers attitude towards Violence		0.023	0.02	2.21***	0.25	0.024	2.1***
Women employment status		-0.05	0.032	-2.1***	-0.18	-0.04	-1.24
Age difference with her husband		-0.02	0.07	-1.4	-0.04	0.021	-1.15
Sex of household head		-0.32	0.035	-0.87	0.014	0.082	0.15
Partner's education							
	No education	-0.14	0.056	-2.54***	-0.28	0.09	-0.16
	primary education	-0.1	0.051	-1.93***	-0.018	0.092	-0.23
	secondary education	-0.08	0.005	-1.8***	-0.016	0.031	-0.22
Sex of Child		-0.03	0.017	-0.35	0.007	0.063	0.0001
Age of Child in groups							
	≥6 and < 12 months	-1.3	0.04	-16.4***	-0.92	0.13	-6.31***
	≥12 and < 24 months	-1.97	0.043	-34.6***	-1.43	0.01	-11.43***
	≥24 and < 36 months	-1.89	0.041	-28.3***	-1.23	0.132	-11.76***
	≥36 and < 48 months	-1.67	0.039	-28.43***	-1.28	0.12	-9***
	≥48 and < 60 months	-1.76	0.038	-26.4***	-1.47	0.12	-12.2***
Number of household members		-0.006	0.004	-1.27	0.007	0.005	1.08
Wealth index of households		0.12	0.024	2.62***	0.13	0.038	3.04***
Access to toilet facility		-0.037	0.04	-0.72	0.12	0.11	1.91*
access to clean water		-0.03	0.054	-0.53	-0.043	0.15	-0.48
constant		0.35	0.21	3.14***	-0.031	0.13	-0.23
	Number of observations	6823		Number of observations		1244	
	F(21,6801)	113.8		F(21,1222)		24.23	
	Prob>F	0		Prob>F		0	
	R-squared	0.24		R-squared		0.263	
	Adjusted R-squared	0.231		Adjusted R-squared		0.234	

Note:***,**,* refer to 1,5 and 10 percent level of significance respectively

CHAPTER FIVE

5. Conclusion and Recommendation

5.1 Conclusion

Malnutrition currently is a prime agenda in most of developing country's Millennium Development goals in which a large number of children, specifically below the age of five have been suffering from it. The causes of child malnutrition are multidimensional in which it may ranges from factors as broad as political instability and socioeconomic growth to those as specific as diarrheal diseases. Moreover, the adverse consequences of malnutrition are many such that they affect not only individuals but also the economic activity of a country in which it will entirely affect the country's sustainable development through problems of intergenerational poverty transmission from mother to child as well as from child to new born child as well.

The analysis of the 2011 EDHS data has shown that malnutrition is a serious problem among Ethiopian children. It is indicated that stunting and underweight prevalence rates are very high such that almost half of the children covered by the survey were either stunted or underweight. This is significantly high even by Sub Saharan Africa standard. Moreover, the prevalence rate of child malnutrition shows a significant difference between rural and urban children in which case stunting and underweight prevalence rates are disproportionately higher in rural parts of the country.

In addition, the socioeconomic and demographic characteristics of households exhibit a significant difference between rural and urban households. It is found out that urban households have generally better socioeconomic status compared to rural households. Furthermore, among total regions in the sample Amhara, Tigray and Afar region are regions with high level of stunting followed by SNNP.

From the total sample, 95 percent of the mothers are either uneducated or have not studied beyond the primary level. Only 5 percent of the mothers have received schooling either secondary or higher education. The decision making index shows that, on average, women are generally involved in 63.05 percent of the household decisions related to expenditures for daily needs or large purchases, visits to family, and their own and their child's health.

A Chi Square test to examine the strength of the bivariate association between categorical variables and the nutritional status indicators shows that mothers' education, decision making role of mothers, mothers' attitude towards violence are significantly associated with stunting and underweight alongside age of a child. The association between employment status of mothers' and nutritional status is found to be weaker.

The multivariate analysis shows that mothers' education, age of child, womens' decision making and their attitude towards violence are important determinants of child nutritional status in rural and urban areas. The effect of these explanatory variables on height-for-age and weight-for-age is strong even compared to the other household characteristics. Similarly, access to toilet facility has a strong positive effect on nutritional status of rural samples. Contrary to these, employment status of women is a weak predictor of nutritional status of children such that it emerged as a significant contributor to only weight-for-age z-score of a rural child.

The wealth index of a household has a statistically significant effect on nutritional status for both rural and urban samples. House hold access to basic services as measured by toilet and pure water supply also infers a little bit significant though there is a considerable variation among rural and urban samples.

Above all, our results indicate that child malnutrition in Ethiopia, especially chronic malnutrition, is significantly affected by attitudes toward domestic violence, maternal education, maternal decision making, child age and wealth index of households.

Our study contributes to the literature on women's empowerment and child outcomes by identifying which aspects of empowerment are most relevant for child growth and nutrition. Our findings strengthen the argument that attitudes toward domestic violence, maternal educational attainment and decision making role are associated with child nutrition. These findings may therefore help identify areas for intervention.

5.2 Recommendation

The general objective of the study is to assess the role of women's status on Ethiopian Children's nutrition security. The finding of the study showed that women's intra household status as measured by women's education, decision making role of women, women's attitude towards domestic violence are indeed significant contributors to nutritional status of children.

Consequently, intervention programs focusing on mothers' or in general women's status would contribute to the effort towards alleviating the problem of child malnutrition in Ethiopia. In particular, taking into account the low level of mothers' education, decision making and low level of attitude towards domestic violence at national level and especially in rural parts of the country, policy actions that are meant to improve the educational status of women and other issues are critical in addressing the problem through improving their income earning capacity and also enhancing the quality of care and attention they can provide to their children.

In addition, interventions for improving household status of women are important. This seems crucial since women in Ethiopia have a lower economic, social, and

cultural status. Therefore, effort should be directed towards changing the attitude of society with respect to practices which undermine the status of women, for instance early marriage. Also bridging the educational attainment gap between women and men, and encouraging women's participation in income generating activities can improve women's status and thereby their children's nutritional status. It should be also considered that though the current regime is against early marriage still now in some rural and remote parts of the country the problem is there.

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APPENDICES

Appendix

Pair-wise correlation of variables utilized in empirical estimation

	HAZ	WAZ	NHHM	SDW	TToilet	Peduc	Wemplo~t
HAZ	1.0000						
WAZ	0.9420	1.0000					
NHHM	0.0350	0.0323	1.0000				
SDW	-0.0269	-0.0527	0.0826	1.0000			
TToilet	-0.0309	-0.0681	0.0142	0.2210	1.0000		
Peduc	0.0087	0.0470	-0.0950	-0.2601	-0.2218	1.0000	
Wemployment	0.0415	0.0568	-0.0150	-0.0582	-0.0952	0.0832	1.0000
DSexCh	0.0507	0.0737	0.0113	0.0002	0.0232	-0.0038	-0.0233
DSexHH	0.0328	0.0392	0.0763	0.0458	-0.0105	-0.0936	0.0218
DWIlletrate	0.0124	-0.0244	0.1266	0.2406	0.1970	-0.4692	-0.0966
DWPrimary	-0.0242	-0.0045	-0.0753	-0.1199	-0.1051	0.2753	0.0593
DWSecondary	0.0075	0.0353	-0.0954	-0.2037	-0.1454	0.3046	0.0046
DWHigher	0.0266	0.0531	-0.0670	-0.1738	-0.1480	0.3254	0.1354
DPoorest	-0.0316	-0.0666	0.0411	0.2995	0.3511	-0.2045	-0.0957
DPoorer	-0.0166	-0.0248	0.0206	0.1211	0.0777	-0.1094	-0.0021
Dmiddle	-0.0237	-0.0254	0.0034	0.0348	-0.0436	-0.0863	0.0437
Dricher	0.0149	0.0240	0.0158	-0.0502	-0.1196	0.0457	0.0234
Drichest	0.0645	0.1087	-0.0905	-0.4766	-0.3493	0.4039	0.0530
piped	0.0288	0.0472	-0.0536	-0.7674	-0.2036	0.2163	0.0712
Openwell	-0.0107	-0.0216	0.0284	0.4293	0.0421	-0.1092	0.0028
surface	-0.0230	-0.0331	0.0334	0.4537	0.1986	-0.1408	-0.0885
DWemp	-0.0428	-0.0552	0.0139	0.0261	0.0876	-0.0382	-0.9108
DHusilletr~e	-0.0029	-0.0375	0.0792	0.1940	0.1993	-0.8346	-0.0963
DHusprimary	-0.0036	0.0141	-0.0430	-0.0527	-0.1031	0.3748	0.0850
DHusSec	0.0038	0.0246	-0.0126	-0.1541	-0.1078	0.4516	-0.0116
DHushigher	0.0112	0.0300	-0.0787	-0.1722	-0.1186	0.6357	0.0488
EducDiffer~e	-0.0017	-0.0117	0.0017	0.0407	0.0633	-0.6168	-0.0010
AgeDiffere~e	0.0201	0.0260	-0.0185	0.0043	-0.0170	0.0511	0.0199
DI	0.0002	-0.0130	0.0507	0.1111	0.0690	-0.0831	-0.0758

	DSexCh	DSexHH	DWIlle~e	DWPrim~y	DWSeco~y	DWHigher	DPoorest
DSexCh	1.0000						
DSexHH	-0.0185	1.0000					
DWIlletrate	-0.0071	0.0386	1.0000				
DWPrimary	0.0054	0.0014	-0.8848	1.0000			
DWSecondary	0.0210	-0.0682	-0.2749	-0.1034	1.0000		
DWHigher	-0.0210	-0.0490	-0.2046	-0.0769	-0.0239	1.0000	
DPoorest	0.0183	-0.0830	0.2025	-0.1495	-0.0935	-0.0892	1.0000
DPoorer	-0.0114	0.0629	0.1009	-0.0552	-0.0802	-0.0638	-0.3198
Dmiddle	-0.0051	0.0566	0.0396	0.0048	-0.0709	-0.0599	-0.3001
Dricher	-0.0010	0.0513	-0.0572	0.0888	-0.0355	-0.0466	-0.2975
Drichest	-0.0046	-0.0698	-0.3349	0.1478	0.3025	0.2802	-0.3047
piped	-0.0025	-0.0180	-0.2083	0.1200	0.1552	0.1254	-0.3208
Openwell	-0.0190	0.0409	0.1000	-0.0454	-0.0955	-0.0726	0.0684
surface	0.0237	-0.0230	0.1411	-0.0945	-0.0823	-0.0715	0.3106
DWemp	0.0209	-0.0413	0.0770	-0.0556	0.0118	-0.1007	0.0870
DHusilletr~e	0.0017	0.0174	0.4006	-0.3109	-0.1783	-0.1353	0.2243
DHusprimary	-0.0018	0.0675	-0.1831	0.2252	-0.0197	-0.0781	-0.1628
DHusSec	0.0092	-0.0775	-0.2386	0.1389	0.2041	0.1039	-0.0793
DHushigher	-0.0109	-0.1142	-0.2710	0.0647	0.2485	0.4030	-0.0709
EducDiffer~e	0.0001	0.0258	-0.1616	0.1473	-0.0072	0.0874	0.0862
AgeDiffere~e	-0.0066	0.0322	-0.0445	0.0431	0.0044	0.0074	-0.0443
DI	0.0077	0.0213	0.0949	-0.0541	-0.0544	-0.0806	0.0951

	DPoorer	Dmiddle	Dricher	Drichest	piped	Openwell	surface
DPoorer	1.0000						
Dmiddle	-0.2147	1.0000					
Dricher	-0.2128	-0.1997	1.0000				
Drichest	-0.2180	-0.2046	-0.2027	1.0000			
piped	-0.0969	0.0203	0.1170	0.3575	1.0000		
Openwell	0.0964	0.0361	-0.0242	-0.1952	-0.6224	1.0000	
surface	0.0114	-0.0637	-0.1142	-0.2166	-0.5226	-0.3421	1.0000
DWemp	-0.0240	-0.0541	-0.0262	-0.0025	-0.0518	-0.0198	0.0837
DHusilletr~e	0.0640	0.0379	-0.0905	-0.2891	-0.1572	0.0517	0.1324
DHusprimary	0.0094	0.0283	0.1039	0.0594	0.0393	0.0283	-0.0779
DHusSec	-0.0825	-0.0705	-0.0025	0.2545	0.1206	-0.0823	-0.0551
DHushigher	-0.0838	-0.0786	-0.0226	0.2733	0.1530	-0.0989	-0.0760
EducDiffer~e	0.0111	0.0117	-0.0443	-0.0850	-0.0446	0.0167	0.0354
AgeDiffere~e	0.0107	-0.0078	0.0267	0.0246	0.0158	-0.0146	-0.0031
DI	0.0178	0.0035	-0.0080	-0.1304	-0.1074	0.0567	0.0671

	DWemp	DHusil~e	DHuspr~y	DHusSec	DHushi~r	EducDi~e	AgeDif~e
DWemp	1.0000						
DHusilletr~e	0.0640	1.0000					
DHusprimary	-0.0761	-0.8095	1.0000				
DHusSec	0.0315	-0.2667	-0.1985	1.0000			
DHushigher	-0.0134	-0.2174	-0.1618	-0.0533	1.0000		
EducDiffer~e	-0.0147	0.6832	-0.4971	-0.2562	-0.1951	1.0000	
AgeDiffere~e	-0.0019	-0.0603	0.0504	0.0073	0.0199	-0.0225	1.0000
DI	0.0883	0.0549	-0.0084	-0.0395	-0.0696	0.0034	-0.0274

	DI
DI	1.0000

DECLARATION

I, the undersigned, declare this thesis is my own work and has never been presented in any other university. All sources of materials used for this thesis has been duly acknowledged.

Declared by:

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