

WOMEN'S STATUS, STATE CONTEXTS AND CHILD UNDERNUTRITION IN  
LOW AND MIDDLE INCOME COUNTRIES

A DISSERTATION

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

IN THE GRADUATE SCHOOL OF

TEXAS WOMAN'S UNIVERSITY

DEPARTMENT OF SOCIOLOGY AND SOCIAL WORK

COLLEGE OF ARTS AND SCIENCES

BY

KATHLEEN A. ANANGWE, M.A.

DENTON, TEXAS

DECEMBER 2015

## DEDICATION

To John Zik who left too soon, and to Reuben, our most precious gift!

## ACKNOWLEDGEMENTS

This dissertation is the culmination of a doctoral experience inspired and guided by brilliant professors and astute mentors. On this doctoral journey I have developed an appreciation for scholarly challenge, informed discourse and specifically nurtured my sociological imagination. I have gained valuable insight through coursework, formal and informal discussion and challenging assignments. It certainly has been worth it!

I would like to take this opportunity to sincerely thank my dissertation committee without whose inspiring words and ideas I would not have accomplished this goal. I wish to specifically thank my chair Professor James L. Williams for his patience and encouragement. Professor you challenged me to develop my interest, create my own path and follow it. Your guidance has ignited my respect for sound research and shown me that I should not “miss the forest for the trees.” Thank you for a truly evaluative response to all my writing through the research twists and turns, and for always making time to support my needs. You have made this a valuable learning experience. Because of you I am now a better writer and critic of my own work.

To the other members of my committee Professor Mahmoud Sadri and Professor Daniel Rodeheaver, I express my appreciation for your valuable time, positive attitude, comments, and motivation. Professor Sadri thank you for always being a source of inspiration, and extending my knowledge of sociological theory beyond Talcott Parsons. You have always inspired me to leave my mark on my work.

Professor Rodeheaver, thank you for your thought provoking dialogue at the beginning of our class where you asked “what is development?” and opened my eyes to perspectives other than dependency. Thank you for sharing your field experiences and encouraging me to be critical rather than comfortable in the field of sociology; and to be wary of the labels. Because of you I am now aware of possibilities at my disposal even with restrictive data. I now know what to do going forward.

Other professors with whom I share this sense of accomplishment and wish to thank include, Professor P. Yang, Dr. J. Gullion, Dr. L. Zottarelli (formerly of TWU), Professor J. Oppong and Dr. A. Moore (University of North Texas). I am fully aware that I have come this far because of your instruction and willingness to steer me in the right direction. To my mentors Professor D. Waruta, thank you for always reminding me to keep my eye on the prize, and Dr. V. Owuor for consistently inspiring me to “join the dots,” and create new knowledge. Your willingness to ensure I excel humbles me.

I am indebted to all of my friends and colleagues who have been my companions on this journey. Drs. Patrice Lockett, Kavitha Koshy and Corinne Ong, you set the pace and in your footsteps I have followed. Thank you for sharing your intellectual wisdom, and for shining a light on the path so that I could “see” the footprints whenever darkness set in. Joanna Lara, thank you for your willingness to listen and kindness in sharing your brilliance-never letting me drown in the “p” value!

To my colleagues Dr. Chris Grice and Martel Pipkins thank you for enthusiastically sharing your academic reflexivity and showing me that “things are not always as they seem” and for “having my back!” Florence T., Maggie B. and Pat L., you give meaning to true friendship; Lucas and Luis Espinoza thank you for your good cheer and spirited approach to life and your willingness to share knowledge selflessly. To Samantha Farmer without whom many “things” would not fall in place for me - thank you for being there.

A special thank you is reserved for Reuben who never complained, your constant smiles and encouragement worked magic. For all the love, support and prayer from my parents Robert and Elizabeth - Anangwe, and siblings Emmy, Charlie and Mildred, Byron and Pauline, Ben, David and Shona and the extended family, without you all this would still be a dream!

Finally, I must acknowledge the immense institutional support and goodwill I have received from the Dr. Celia Lo (Chair) Department of Sociology and Social Work at Texas Woman’s University-USA, and the University of Nairobi- Kenya. Thank you for giving me the opportunity to exercise my academic freedom. I could never have accomplished this task otherwise and therefore, I remain forever in your debt.

## ABSTRACT

### WOMEN'S STATUS, STATE CONTEXTS, AND CHILD UNDERNUTRITION IN LOW AND MIDDLE INCOME COUNTRIES

KATHLEEN A. ANANGWE

DECEMBER 2015

Past research has sought to explain the child undernutrition conundrum as a result of mainly household-level factors and morbidity while ignoring salient socio-structural determinants such as women's status and state contexts. However, in the past three decades women's status has improved socially, economically and politically, enabling them to realize their potential as partners in structuring social change. Similarly, low and middle income country contexts have within the same period experienced rapid socio-economic progress by taking advantage of globalization. This dissertation fills the gaps in literature and investigates the inconsistencies between these positive incidences and the current dismal state of children's nutrition. Apparently, 80 percent of the world's undernourished children reside in LMICs according to global estimates.

The study examines two questions. First, to what extent is the improved status of women engendering pathways to diminish child undernutrition in LMICs? Second, why is child undernutrition prevalent in LMICs? Using a quantitatively constructed dataset of 139 LMICs drawn from existing reliable data sources including the World

Bank, CIA, PARLINE and the Human Development Index, data are analyzed using Ordinary Least Squares Regression.

Significant findings suggest that empowered women engender pathways through opportunities within social, political, and economic spaces to alleviate child undernutrition. However, gender disparities inhibit women from passing on these status benefits to their children. Thus, although women can alleviate child undernutrition, they require the support of an enabling social structure. As indicated by the findings, child undernutrition is exacerbated by structural regional inequalities and the prevalence of contaminated water more than by MNC penetration, trade deficits, and debt. Contrary to expectation, women's vulnerable employment has no observable effect on child undernutrition.

Several policy recommendations emerge from this study. First, gender inequalities need to be consistently addressed to moderate structural socio-cultural contradictions. Second, research information should be shared to take advantage of modified theoretical perspectives and augment existing implementation designs. Third, regional cooperation in managing and improving natural resources such as water will cascade nutritional benefits to children. Finally, regional philanthropy directed at children's nutritional needs in the early years will diminish nutritional defects and accumulate advantages for adulthood.

## TABLE OF CONTENTS

	Page
DEDICATION.....	iii
ACKNOWLEDGMENTS.....	iv
ABSTRACT.....	vii
LIST OF TABLES.....	xii
LIST OF FIGURES.....	xiii
Chapter	
I. INTRODUCTION.....	1
Research Questions.....	7
The Importance of Child Undernutrition.....	10
Rationale.....	13
Plan of Work.....	17
II. LITERATURE REVIEW .....	18
What is Child Undernutrition.....	18
Dimensions of Child Undernutrition.....	22
Regional Trends.....	25
Women’s Status and Child Undernutrition.....	27
The Millennium Development Goals.....	30
Child Undernutrition, Women’s Status and Economic Development.....	31
Low and Middle Income Countries and Child Undernutrition .....	33
Historical Structures in LMICs and Child Undernutrition.....	34
Child Undernutrition and Social Conditions in LMICs .....	35
Theoretical Framework.....	38
Wallerstein’s World Systems Perspective.....	39
Gender Stratification Perspective .....	43
Research Questions and Hypotheses .....	45



III. METHODS AND DATA .....	50
Data.....	50
Sources and Sample .....	50
Data Collection.....	54
Variables and Measurements .....	54
Dependent Variable(s) .....	55
Independent Variables .....	57
Women’s Status.....	57
Gender Empowerment and Gender Development.....	57
Vulnerable Employment.....	59
State Contexts.....	61
Gini Coefficient.....	61
Democracy.....	61
Trade Links.....	62
External Debt.....	63
Multinational Presence(MNC).....	64
Region.....	64
Contaminated Water Sources.....	65
Control Variables.....	66
GDP per Capita.....	66
Population Growth Rate.....	66
Political Power.....	67
Women’s Mobility.....	67
Data Analysis.....	70
Variables Excluded in the Regression Models.....	72
IV. RESEARCH FINDINGS .....	77
Introduction.....	77
Regression Diagnostics.....	77
Descriptive Analysis .....	81
Bivariate Analysis and Multivariate Analysis.....	86
Research Question 1 .....	88
Hypothesis 1 .....	88
Hypothesis 2 .....	89
Hypothesis 3 .....	90
Research Question 1 .....	96
Hypothesis 4 .....	96
Hypothesis 5 .....	102
Hypothesis 6 .....	103
Hypothesis 7 .....	104

Hypothesis 8 .....	106
Chapter Summary.....	109
V. INTERPRETATION AND DISCUSSION .....	112
Pathways Engendered by Women’s Status.....	112
Gender Empowerment.....	112
Gender Development .....	116
Women’s Vulnerable Employment.....	118
Reasons for the Prevalence of Child Undernutrition Prevalent in	
LMICs.....	119
Regional Inequalities.....	120
The Prevalence of Contaminated Water Sources .....	123
Debt .....	124
Trade Links and MNC Penetration .....	125
VI. SUMMARY AND CONCLUSION.....	127
Summary .....	127
Modified Perspectives .....	131
Implications of the Study .....	132
Policy Recommendations.....	135
Contributions and Limitations.....	137
Future Research.....	143
REFERENCES.....	146
APPENDICES	
A: World Bank List of LMIC countries.....	176
B: Table10: Partial Eta <sup>2</sup> for all Predictors.....	179
C: Summary of Findings by Hypothesis.....	181
D: Determinants to Reductions in Child Undernutrition.....	184
E: IRB Letter of Approval.....	186

## LIST OF TABLES

Table	Page
1. Consequences of Child Undernutrition across a Lifespan.....	20
2. Estimated Prevalence of Selected Nutritional Deficiencies in Children Under 5, by Region (Percent).....	25
3. Composite Indicators Measuring Women’s Status in LMICs.....	59
4. List of Variables, Variable Names, and Sources.....	68
5. Descriptive Statistics of All Variables Used in the Analysis, 2013.....	85
6. Bivariate Correlation Matrix for child Undernutrition in LMICs.....	92
7. Estimates of OLS Regression Models for Women’s Status Predicting Stunting, Severe Wasting, and Underweight among Under -5s in LMICs 2013.....	95
8. Estimates of OLS Regression Models for State Contexts Predicting Stunting, Severe Wasting, and Underweight among Under -5s in LMICs in 2013.....	99
9. Estimates of OLS Regression Models for Women’s Status and State Contexts Predicting Stunting, Severe Wasting, and Underweight among Under -5s in LMICs 2013.....	107
10. Partial Eta’s Squared for All Predictors in the Analysis of Child Undernutrition In Low and Middle Income Countries, 2013.....	180
11. Summary of Findings by Hypotheses.....	182

## LIST OF FIGURES

Figure	Page
1. Anthropometric Measures Used to Gauge Child Undernutrition Globally.....	24
2. Estimated Contribution of Major Determinants to Reductions in Child Undernutrition, 1970-95 in LMICs.....	185

## CHAPTER I

### INTRODUCTION

*“Sound nutrition can change children’s lives, improve their physical and mental development, protect their health, and lay a firm foundation for future productivity” Kofi Annan (UNICEF 1998).*

There is a growing consensus in scholarly research that child undernutrition with its far reaching and deleterious consequences remains understudied in LMICs<sup>1</sup> due to a proliferation of competing global concerns such as social inequalities of health, access to resources, education, climate change, civil war, and governance (Sen 2000a; Agadjanian and Prata 2003; Black, Morris, and Bryce 2003; Wagstaff, Bustreo, Bryce, and Claeson 2004; Milanovic 2005; Seligson and Passe-Smith 2008; Crow and Lodha 2011). As resources become scarce and exploitation, exclusion, and hierarchy take root, there remains little time and attention to spare for child undernutrition<sup>2</sup>

---

<sup>1</sup>Each year the World Bank revises the classification of the world’s economies based on the estimates of gross national income (GNI) per capita for the previous year. In this dissertation, the reference to GNI as a measure implies the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad. Thus the average earned nationally among low income countries is up to \$1,035. In middle income countries, this average earning is \$1,036 to \$4,085 and in upper middle income countries the average national income is between \$ 4,125 and 12,746. These classifications determine the country’s lending eligibility. In some articles, Low and Middle Income Economies (LMICs) are also referred to as developing economies (LDCs) (World Bank Data 2013). These categories seek to give better conditions to poorer countries based on economic capacity (Sumner 2012).

<sup>2</sup>Undernutrition is the outcome of insufficient food intake and repeated infectious disease. It includes being underweight, stunted, and wasted - in other words deficient in vitamins and minerals (UNICEF 2006). It is a part of malnutrition, which is the more commonly, used term. However, by specifying undernutrition in this study, the paper excludes discussion on over nutrition (obesity) which tends to be included. According to World Development Indicators (World Bank Data 2013) under nutrition in children can be assessed by their weight for age (underweight), height for age (stunting), and by their body mass index (wasting), which is a ratio of weight to

because it is considered an “old problem” (Gwatkin 2000; Wagstaff and Watanabe 2000; de Onis and Blossner 2003; Therborn 2006; Crow and Lodha 2011).

A number of scholars have argued that child undernutrition need not be considered on its own as a substantive social problem, since it is already subsumed within policies aimed at reducing inequality worldwide (Gwatkin 2000a, Gwatkin 2000b; UNICEF 2006b). This line of argument has, however, been rejected by a panel of experts at the recent meeting of the Copenhagen Consensus project group<sup>3</sup>. The experts instead maintain that child undernutrition should be more than a footnote and ought to be prioritized by policy makers and philanthropists. Currently, one in four children worldwide is stunted, 80% of whom live in 14 of the LMICs (UNICEF 2013).

Within the past two decades social science research has discovered a link between child undernutrition and current human development deficits in LMICs (Marsh 2014; World Bank 2014). Policy makers in these regions have warned that this link opposes prospects for socio-economic growth which is highly reliant on human resources, implying therefore a need for serious consideration of the underlying threat of the long-term consequences of child undernutrition (Weeks 2012; UNICEF 2013).

---

height. Being even mildly underweight increases the risk of death and inhibits cognitive development in children. Stunting, or being below median height for age, is often used as a proxy for multifaceted deprivation and as an indicator of long-term changes in malnutrition. Stunting refers to the percentage of children under age 5 whose height for age (stunting) is more than two standard deviations below the National Center for Health Statistics/WHO reference median value. Estimates of child malnutrition, based on prevalence of underweight and stunting, are from national survey data. Height is measured by recumbent length for children up to two years old and by stature while standing for older children.

<sup>3</sup>Copenhagen Consensus is a project establishing priorities for advancing global welfare using cost benefit analysis. The most recent meeting was held in 2012, where child nutrition was emphasized (see *Top economists identify the smartest investments for policy-makers and philanthropists*), 14 May 2012, <http://www.copenhagenconsensus.com/Default.aspx?ID=1637>.

Additionally, these threats notwithstanding, it is worthwhile at this point in time to shift attention from the ongoing under-five mortality decline cited in extensive research on the region, and attend the question of the nutritional state of children surviving beyond five years (Ahmad, Lopez, and Inoue 2000).<sup>4</sup> By extension, researchers submit that paying attention to child undernutrition is one way of forestalling the myriad complex social development challenges afflicting LMICs (Black, Allen, Bhutta, and Caulfield 2008; Renner 2011).

Bearing in mind then that child undernutrition is escalating faster than per capita incomes, and has the potential to worsen emerging social problems affecting children such as inequality, obesity, morbidity<sup>5</sup> and mortality indicates the required urgency to alleviate the problem (Gwatkin 2000a; Larrea and Kawachi 2005; Peterson 2009; Crow and Lodha 2011; Liu, Johnson, Cousens, Perin, Scott, Lawn, Rudan, Campbell, Cibulskis, Li, Mathers, and Black 2012; McMichael 2012; Minujin and Nandy 2012; Pei, Ren and Yan 2014). Moreover, because the long-term effects of child undernutrition diminish human capacity, LMICs dependent on a human workforce to mitigate the shortfalls of mechanized labor, find themselves unable to meet national goals and the ultimate objective of rapid industrialization (Sen 1999; Hoogvelt 2001).

---

<sup>4</sup>Already LMICs have managed a 40% decline in child mortality in the past two decades and this laudable effort can be further enhanced by focus on strengthening the capacity of children who have survived (Renner 2011; Lutter and Rivera 2003). Estimates state about 10.5 million children under 5 years died in 1999, and this was 17.5% fewer than a decade earlier (Ahmad et al. 2000).

<sup>5</sup>Recent estimates by UNICEF and WFP indicate that if child undernutrition is left unchecked, it will have catastrophic consequences on already fragile social structures in addition to worsening outcomes of the ongoing “nutrition transition,” namely obesity and diabetes (Weeks 2012; Popkin 2001).

Child undernutrition not only affects the economic output of countries, but that of communities as well (World Bank 2014). In other words, the long-term effects which are intergenerational create burdens of illness, disease, poverty and death stressing meager resources within families as well (Matte, Bresnahan, Begg, and Susser 2001; Benson and Shekar 2006; Minujin and Nandy 2012; UNICEF 2013). Incidentally, the effect of child undernutrition on communities begins at birth hindering children's contribution in adult life through deficient growth and poor education which sets them up for paltry income and low earnings. The current focus on infrastructure development in a large number of LMICs is evidence that priorities lie with global trends to rapidly industrialize rather than with children's nutrition needs (Bryceson 2002).

Recent research has exposed weaknesses in the conceptual approaches to resolving the child undernutrition conundrum. This is evident in the marginal and truncated methodologies currently undertaken in LMICs by government and non-governmental organizations, sometimes working in contradiction and excluding women who are a direct determinant of children's nutritional status (Kabeer 2003; UNICEF 2006; Elson 2010; Aulette and Wittner 2015).<sup>6</sup> For example it defies logic that women's current improved status and visibility in the socio-economic and political arena is having little impact in areas such as children's nutrition which could reap the benefits of their increased income, education and leadership (Ridgeway 1997; Kent

---

<sup>6</sup>See Appendix D: The modified diagram indicates the salience of women's status (education, decision making, income, and mobility) in relation to other aspects that determine children's nutrition (Smith and Haddad 2000).



2002; Mohanty 2003; Peet and Hartwick 2009; Bradshaw 2013). As such, women's contribution is limited, and their potential as an influential social group is underutilized. This relegate them to positions of passive observer rather than active participator even in providing solutions to problems such as child undernutrition (Umukoro 2014).

Economists explain that as much as child undernutrition foreshadows life course catastrophes, there are intrinsic contexts in which it spreads such as during moments of social upheaval, rising unemployment, falling wages, food and oil price increases, and heightened social inequality (Gwatkin 2000a; Peet and Hartwick 2009; Elson 2010; McMichael 2012). While these are documented problems of the 1980s and 1990s, they recently appear to be more frequent in LMICs, thus rendering the nutrition situation of children even more precarious.

The purpose of this dissertation is to investigate the pathways through which women's status and LMIC contexts alleviate and incubate child undernutrition. One important aspect of examining these pathways and contexts is to explicitly define the term child undernutrition so as to delineate its scope and topical relevance. Child undernutrition is generally a lack of access to nutritious food in adequate quantities, measured by height, weight, skin fold thickness (subcutaneous fat), and age (Nandy, Irving, Gordon, Subramanian, and Smith 2005; Katona and Katona-Apte 2008; UNICEF 2013). Occasionally, when severe, it appears as marasmus (deficiency of calories and proteins leading to weight loss and dehydration) or kwashiorkor (a deficiency of protein or an over consumption of carbohydrates). Physically, child

undernutrition is observable in stunting, being underweight, and wasting because of prolonged food deprivation, disease, or illness (Rodeheaver, Bates, and Murphy 1982; Benson and Shekar 2006; Zottarelli, Sunil, and Rajaram 2007).

Currently, a good amount of research concludes that the feedback mechanisms among disease, undernutrition and mortality account for their high incidence in LMICs. For example, among 60 percent of all child deaths caused by undernutrition, 35% have been directly related to diarrhea, pneumonia, measles, malaria, and infectious diseases (Caulfield, de Onis, and Black 2004; Wagstaff et al. 2004; Black et al. 2008; Horton 2008; Zaracostas 2008; Olack, Burke, Cosmas, Bamrah, Dooling, Feikin, Talley, and Breiman 2011; UNICEF 2013). In response, there is concerted effort in LMICs to reduce disease and death among children using various approaches, and these efforts have been acknowledged by sociologists, anthropologists and epidemiologists. However, similar discourse and comparable action on child undernutrition is lacking (Rice, Sacco, Hyder, and Black 2000; Alderman, Hoddinott, and Kinsey 2006; Nandy et al. 2005; Peterson 2009). This situation is exacerbated by certain cultural patterns such as supporting gender preference for male over female children, patrilineal power structures dictating the access and distribution of food, as well as the “feminization of poverty and labor”<sup>7</sup> keeping women in low-paying jobs, to mention a few examples (Chant and Sweetman 2012; Bradshaw 2013; Monshipouri 2014).

---

<sup>7</sup>It is an hypothesis presented by Pearce (1978) who noted in the United States that poverty was becoming “feminized.” It postulates that women experience disadvantages through processes that are institutionalized leading to greater poverty among them compared to men (Owusu-Afriyie and Nketiah -

A steadily growing literature defines child undernutrition as a scourge on the intellect and a catalyst for poverty (Renner 2011; UNICEF 2013). This suggests that the ongoing limited focus obscures its predicted adverse long-term effects on individual capabilities and communities (Anderson 2014; Smith and Seligson 2008; Marsh 2014). Presently, LMICs have a window of opportunity to mitigate the impact of these projected negative trends on human development and economic output by targeting child undernutrition as an investment in human resources (Alkirie 2002; Kuonquii 2006; Weeks 2012; Amin, Kuntcher, and Schmidt 2015).

## RESEARCH QUESTIONS

There are two research questions that will guide this study. The first research question asks, “To what extent is the improved status of women engendering pathways to diminish the prevalence of child undernutrition in LMICs?” This question assumes that historical processes such as independence from colonial government, advocacy for women’s equality and social change have collectively elevated the social, economic and political status of women in LMICs (Sudarkasa 1986; Kabeer 2003; Yoon 2004; Hyder, Maman, Nyoni, Khasiani, Teoh, Premji, and Sohani 2005; Payne and Nassar 2006; Chant 2007; Horton 2008; Peet and Hartwick 2009; Peterson 2009; Pfeiffer and Chapman 2010; McMichael 2012; Akyeampong and Fofak 2013: Global Gender Gap Report 2013; Ridgeway 2014). Extant research indicates that women in LMICs now have greater access to resources and demonstrate greater autonomy because of higher

---

Amponsah 2014). It highlights the links between the social and economic subordination of women (Chant 2007).

education, and income, better healthcare and inclusive power structures when compared to their predecessors (Smith and Haddad 2000; Quisumbing 2003; Payne and Nasser 2006). In addition, economic advantage has accrued to women in wage employment and linked them to global networks, bringing them close to their counterparts in the industrialized world (Ng and Aksoy 2008). As such, it is generally expected that children and communities are among the beneficiaries of such positive outcomes. However, it is important to evaluate women's new gains and the overall positive effect they have on children's nutrition (Tamale 2004). For example policy makers must ensure that women in LMICs know that they have immense social economic and political possibilities available to them and that they have the capacity and wherewithal to benefit from them.

Critical research highlights current global trade arrangements as diminishing women's capacity to safeguard the well-being of children (Kabeer 2003; Pfeiffer and Chapman 2010; Aulette and Wittner 2015). Using the two composite indices of women's status found in gender and development research namely the gender empowerment measure (GEM) and gender development (GDI)<sup>8</sup> measure is advantageous to frame women's status because of the way in which they are constituted (Sudarkasa 1986; Bradley and Khor 1993; Slusser 2009). An additional advantage of using these two measures is that they represent the social, economic, and political aspects of women's status now substantiated by one working theme. In the

---

<sup>8</sup>GEM and GDI are measures derived from the UN's Human Development Index and the Gender-Related Development Index. These indices are elaborated in Chapter 3.

gender empowerment measure (GEM) the three dimensions relevant to this study are economic participation, decision making, political participation and power sharing of economic resources. The gender inequality measure on the other hand incorporates women's life expectancy, education and earned income. This introduces new elements in an analysis of the interaction between women's status and child undernutrition previously assumed in models examining determinants at the household level such as the UNICEF model<sup>9</sup>.

My second question asks "why is child undernutrition prevalent in LMICs?" This question offers ancillary information to the first question by examining the intersection between a select set of homogeneous macro contexts and child undernutrition. In this case the pathways of interest include institutions in the social structure in which the dynamics of gendered relations determine the allocation of resources through power, and relationships modelled culturally, socially, and historically providing insights into the child undernutrition conundrum (Whitehead and Kabeer 2001). Only recently has a considerable amount of research indicated that LMICs are capable of creating dilemmas within their competitive social structure with enough potential to affect children negatively (Agadjanian and Prata 2003; Osaghae 2007; Gore 2010; Anderson 2014).

---

<sup>9</sup>This is a comprehensive framework adapted from UNICEF: *Strategy for Improved Nutrition of Women and Children in Developing Countries* (New York: UNICEF 1990, 1998) that recognizes three levels of causality- immediate, underlying and basic determinants of nutritional status. It incorporates biological and socio-economic causes of malnutrition, and comprises micro and macro level analysis (Smith and Haddad 2000:5; Zottarelli et al. 2007).

Both research questions illuminate new trajectories in an era of millennial “development,” where the distribution of resources and capacity for human capital formation is substantiated by both local capacity and global interrelationships (Hoogvelt 2001; Crow and Lodha 2011). Through such interrelationships LMICs have embraced strategies such as the United Nations Millennium Development Goals<sup>10</sup> giving structural support to less endowed regions (Kabeer 2003; Amin 2006; Clemens, Kenny, and Moss 2007).

#### THE IMPORTANCE OF CHILD UNDERNUTRITION

Child undernutrition is one of the most serious impediments to child survival globally, and is currently considered a threat to the blossoming of human capabilities which is a threat to human resources necessary for “development” in LMICs (Sen 1985; Marsh 2014). Thus, it is referred to as the “silent killer” or “invisible problem” because those affected most are unaware and unable to speak up for themselves to draw attention to their plight. This is a problem that has the capacity to spread unnoticed for long periods of time (Pelletier, Frongillo, Schroeder, and Habicht 1995). Progress has been uneven across regions and countries even after local and international intervention because of existing systemic inadequacies and inequalities in the social systems of LMICs (Caulfield et al. 2004; Tamale 2004; Nandy et al. 2005; UNICEF 2014).

---

<sup>10</sup>The eight Millennium Development Goals (MDGs) form a blueprint agreed on by all the world’s countries and all the world’s leading development institutions for tackling the most pressing development challenges of our time. The goals were a pledge to uphold the principles of human dignity, equality and equity, and free the world from extreme poverty by the target date of 2015. They have galvanized unprecedented efforts to meet the needs of the world’s poorest (UN 2014; Brown, Platt, and Beattie 2015).

Literature focused on the LMIC region indicates that while it is acknowledged that children under the age of five constitute a special demographic group whose quality of life must be protected for the long-term, there is lack of a clear understanding of the scope of consequences it portends. The following are some of the possible consequences of child undernutrition indicated in recent studies.

- a) It has caused high infant mortality. An undernourished child in LMICs is nine times more likely to die than one in any other region of the world (Caulfield et al. 2004; Wagstaff et al. 2004; Black et al. 2010; Wuehler, Hess, and Brown 2011; UNICEF 2013).
- b) It has triggered humanitarian crises (Agadjanian and Prata 2003; UNICEF 2013).
- c) It is causing a rise in the number of disability cases among children (Allen, Bhutta, Caulfield, de Onis, Ezzati, Mathers, and Rivera 2008)
- d) It has worsened disease outcomes and the cycle of morbidity (UNICEF 2006).
- e) It has created an appalling pool of stunted children (Seligson and Passe-Smith 2008; Meade and Emch 2010; Cai and Brown 2011; Liu et al. 2012).
- f) It leads to low school achievement, repeat grades, and dropping out because of metabolic and cardio-vascular disease as well as intellectual deficits (Clemens et al. 2007; Nandy 2005).
- g) It is linked to current global economic inequalities (Rubington and Weinberg 2011). Subsequent low human capital investment is occurring because of unemployment due to illness, lack of skills from poor schooling, and the

absence of “health-led development.” (Smith, Ramakrishnan, Ndiaye, Haddad, and Martorell 2003; Glewwe and Miguel 2008; Sheeran 2008; Maluccio, Hoddinott, Behrman, Martorell, Quisumbing, and Stein 2009; Nissanke and Thorbecke 2010; UNICEF 2013).

- h) It is responsible for the current rise in social<sup>11</sup> and public health problems such as teenage pregnancy among girls, intergenerational cycles of illness and poverty and reduced survival gains achieved through immunization (Crow and Lodha 2011; Jameson et al. 2006; Lancet 2008; Minujin and Nandy 2012).

Clearly, the rapid growth of child undernutrition in LMICs is an unfortunate phenomenon that is threatening the well-being of children and interfering with their chances of becoming actively engaged in the socio-economic development of the region ( Bryce, Coitinho, Hill, Pelletier, and Andersen 2008; Bhutta, Chopra, Axelson, Berman, Boerma, Bryce, Bustreo, Cavagnero, Cometto, Daelmans, de Francisco, Fogstad, Gupta, Laski, Lawn, Maliqu, Mason, Pitt, Rwequejo, Starrs, Victora, and Wardlaw 2010). While this sums up a vast amount of recent information on the negative outcomes of child undernutrition, little is known with similar detail about the consequence of socio-economic inequalities for women’s current improved status, nor of the contextual influence. Neither is much known about the relationship among women's status, homogeneous state contexts and child undernutrition (Anderson 2014; Amin, Kuntchev, and Schmidt 2015).

---

<sup>11</sup>Implied here is a characteristic interconnectedness between the complex nature of child undernutrition and a broad range of social issues it reinforces (Rubington and Weinberg 2011).



## RATIONALE

Although there is an ample body of research on child undernutrition in LMICs and a fair amount on women's status, no studies have combined women's status, homogeneous state contexts, and child undernutrition in empirical investigation. Only recently have studies established that a state's history, geography, and political profile provides important background information that can be utilized in analyzing the extent of influence predictors have on a phenomenon (Osei 2004; Seligson and Passe-Smith 2008). The same can be said for the LMIC region, which comprises a collection of states based on computed incomes by the World Bank who share homogeneous characteristics that define their socio-economic outlook. Additionally, existing gaps in current literature on the specific pathways through which women respond to the child undernutrition conundrum in light of existing social and global (dynamics) challenges indicates the need for further study to substantively recognize child undernutrition as a prolific research entity in LMICs. Moreover, noticeable disconnect between the improved status of women and the persistent prevalence of child undernutrition underscores a need for further investigation

This dissertation contributes theoretical and methodological insight and adds substantive knowledge on child undernutrition as an outcome of gender interactions and governmental inadequacies that exacerbate them. Development sociologists,

gender scholars, activists, policy makers, and researchers will benefit from this research in the following ways:

First, the study adds to the current scope of work on child undernutrition by including women's status and state contexts as intersections in ongoing sociological processes (Rosegrant and Cline 2003). In the recent past, socio-economic and political processes have accorded women empowerment, mobility, and visibility, the impact of which needs to be investigated (Peet and Hartwick 2009). For example, women have become multiple status holders because of their "duality" of roles, which is presenting paradoxes that are not completely understood (Mohanty 2003; Tamale 2004; Chant 2008). Only recently has it come to light that women, states, and children are absorbing the impact of the contradictions of neoliberalism, the full extent of which remains unexplored in literature (Jaggar 2002).

This dissertation builds on the newly elevated status of women as a result of the international women's movement that started in the 1970s and traces the impact of benefits accrued to women socially, economically, and politically (Hoogvelt 2001; Peet and Hartwick 2009). Existing studies have not directly addressed the effect of such macro level mechanisms on child mortality, morbidity, and undernutrition (Shandra, Nobles, London, and Williamson 2004; Nandy et al. 2005). Instead they have studied these two phenomena in isolation from child undernutrition. This dissertation highlights these areas of neglect that portend systemic impediments (Wagstaff et al. 2004; Godfray, Beddington, Crute, Haddad, Lawrence, Muir, Pretty, Robinson, Thomas, and Toulmin 2010). While a large and established literature on the importance

of women's education as a proxy for social status exists, this dissertation will provide additional political and economic dimensions by using human development indexes (Rosegrant and Cline 2003; Smith et al. 2003; Yoon 2004).

Second, this study contributes to the conceptual framework of child undernutrition by using two perspectives, namely the world systems and gender stratification. These are utilized here to frame discussion on how women's status and state contexts predict child undernutrition in LMICs. While researchers who have studied child undernutrition cross-nationally have tended to use theoretical models derived from UNICEF's construct (1990, 1998), this dissertation steers away from reductionism by incorporating these two perspectives (Moseley and Chen 1984; Wallerstein 1979; Chirot and Hall 1982; Shen and Williamson 1997; Rosegrant and Cline 2003; Nandy et al. 2005; Zotterelli et al. 2007; Peet and Hartwick 2009). To my knowledge there is no other research that has utilized these two perspectives together to model the impact of women's status and state contexts on child undernutrition in LMICs. Additionally, this study improves on past cross-national research by using the multiple imputation technique to increase the sample size by including a number of countries in the analysis that have previously been omitted for lack of sufficient data in earlier studies (Donders, van der Heijden, Stijnen, and Moons 2006).

Finally, the conceptual originality of the two research questions guiding this dissertation seeks to widen the scope of study on child under nutrition by introducing intersections of gender and region to refocus and develop new paradigms of thought. The only comparable studies so far are those directly responding to the broad themes of

child survival, mortality and child malnutrition (Mosley and Chen 1984; Smith and Haddad 2000; Mosley and Chen 1984). While some studies responding specifically to child undernutrition in LMICs have used elaborate techniques, most have limited their scope and focus, and almost none have examined the dimensions of women's status and homogeneous state contexts together. Although Smith and Haddad's (2000) cross country analysis shares a similar perspective with this study, it diverges in its purpose, methodology, and definition of women's status dimensions (Smith and Haddad 2000). Similarly, other studies examining women's status and the LMIC region have not directly focused on child undernutrition, but have proposed other subjects of analysis (Shen and Williamson 1997; Shandra, Shandra, and London 2011).

Among those studies that have turned toward investigating child undernutrition directly, most are epidemiological or clinical in nature and few have utilized sociological paradigms in any detail. More recently UNICEF (2013) has isolated only one measure of child undernutrition, namely stunting, in an attempt to refocus attention on the plight of children. An added observation is that during the ongoing MDG period (2000-2013), child undernutrition has not gained much traction as an urgent concern and has instead been incorporated into other areas perceived as more "urgent." I have therefore purposely selected 2013 as my year of reference in this cross sectional, cross national study in a bid to infuse within my arguments and analysis ongoing measures with a view to making a substantive contribution to future discussion on child undernutrition.

## PLAN OF WORK

This dissertation comprises six chapters. Chapter One provides a background summary of the study, its purpose, significance and a plan of work. Chapter Two reviews and summarizes cross-national literature associated with child undernutrition, women's status, and state contexts. Specifically, this chapter is divided into three sections. The first section reviews literature on child undernutrition, its scope, and its dimensions. The second section reviews literature on the LMIC regions, including their salient historical features and reflecting on shared contextual homogeneities. This is followed by a third section which reviews related literature on trajectories of progress among women in LMICs. Chapter Three describes the detailed methodology including the hypotheses, data sources, and data analysis techniques. Chapter Four presents the findings of the analysis, making reference to each hypothesis while using literature to contextualize various assumptions. Chapter Five consists of the interpretation and discussion of results presented in the previous chapter, highlighting areas of consensus and divergence, contextualizing and linking findings to existing literature. Chapter Six concludes the dissertation with a summary of the main findings, implications, contributions, and limitations of this dissertation. This chapter also suggests directions for future research.

## CHAPTER II

### LITERATURE REVIEW

This chapter is in four sections. In the first section, I provide an overview of child undernutrition as a concept, its scope, and its dimensions. In the second section, I review the current literature on low and middle income countries (LMICs) in general, using social, historical, economic and political realities to delineate the existing contextual homogeneities. I explain how these structural homogeneities proliferate, challenge the improved status of women, and incubate child undernutrition. In the third section, I focus on the trajectories of progress women have made over time since the early 1970s, and how these comprise the necessary ingredients for engendering pathways to alleviate child undernutrition. The fourth section concludes this chapter with a discussion of the theoretical framework, research questions and subsequent hypotheses.

#### WHAT IS CHILD UNDERNUTRITION?

Child undernutrition is generally defined as the outcome of insufficient food intake among children under the age of five (Minujin and Nandy 2012; UNICEF 2013; Anderson 2014). According to the World Health Organization (1999), at the beginning of the New Millennium, approximately 200 million children under 5 years of age were moderately to severely undernourished, indicating an impending survival crisis (Iyengar and Nair 2000; Wuehler et al. 2011; UNICEF 2013). Daily estimates of undernourished children demonstrate that diets lacking in essential vitamins, iron,

iodine, calcium, folic acid, and zinc are responsible for the high incidence in LMICs (Iyengar and Nair 2000). Current studies focused on social and economic development in LMICs suggest that, if left unresolved, growth failure, micro-nutrient deficiencies, high mortality and morbidity in children will be exacerbated (Wagstaff 2004; Minujin and Nandy 2012). In response to this, the third Copenhagen consensus held in 2012, resolved that taking action on undernutrition is the single most important cost-effective means of advancing human well-being and a substantial amount of research on the issue has been undertaken over the past decade. This effort however, has uncovered the problem of reciprocal association among undernutrition, mortality, morbidity and disease control (Black et al. 2003; Wagstaff et al. 2004; Bhutta et al. 2008; Habimana, Mwinga, Moses, and Ketsela 2010; Kinney et al. 2010; Olack et al. 2011; Wuehler et al. 2011; Minujin and Nandy 2012; Zottarelli et al. 2013). Without a doubt as recent research shows, the escalation of treatable diseases such as malaria, tuberculosis, diarrhea and helminthic infections can be attributed to the prevalence of child undernutrition (Black et al. 2003; Bhutta et al. 2006; Katona and Katona-Apte 2008; Peterson 2009; Renner 2011; Liu et al. 2012).

Epidemiological and medical research on the other hand confirms that the debilitating nature of child undernutrition is portrayed not only in its inhibition of children's physical and developmental potential, but also in the incidence of high mortality and morbidity rates (Iyengar and Nair 2000; Caulfield et al. 2004; Wagstaff et al. 2004; Zulfiqar et al. 2006; Victora et al. 2008; Renner 2011; Sayem, Nury, and Hossain 2011; Anderson 2014). Presently extant research reiterates that more than 200

million children are not only unable to reach their potential as a result of undernutrition but are also at risk for death (Smith and Haddad 2003; UNICEF 2006; Komlos and Meermann 2007; Black et al. 2008; UNICEF 2013).

Table 1 below illustrates this by detailing the abysmal outcomes of child undernutrition projected over a hypothetical lifespan and whose drastic outcomes have broader consequences affecting not only individuals but communities as well. Considered cumulatively, such consequences constrain social development.

**Table 1: Consequences of Child Undernutrition across a Lifespan**

<u>Life Stage</u>	<u>Common Nutritional Disorders</u>	<u>Main Consequences</u>
<i>Under 5 Years</i>		Growth retardation Developmental retardation Brain Damage Continuing undernutrition
Neonate	Low birth weight, Iodine deficiency disorders	Developmental retardation Brain Damage Continuing undernutrition
Infant and Young child	Iodine deficiency disorders Protein energy malnutrition Iron deficiency Anemia Heart ailments	Developmental retardation Increased risk of infection High risk of death Blindness Anemia
<i>Over 5 Years of Age (at risk for.....)</i>		
Adolescent/Adult/Elderly	Iodine deficiency disorders Iron deficiency Anemia Protein energy malnutrition Folate deficiency Calcium deficiency Obesity Cancer	Delayed growth spurt Stunted height Delayed/retarded intellectual development Goiter Increased risk of infection Blindness Anemia Inadequate bone



---

Osteoporosis	mineralization Maternal anemia Thinness/lethargy Heart disease Diabetes Hypertension/Stroke Spine and hip fractures
--------------	---

---

Source: WHO 1999.

From the table above, motor development, lasting behavioral and cognitive deficits and low IQ are among impediments identified in extensive research that follow through youth and the adult years. Such prospects point to the possibilities of a “double burden”<sup>12</sup> on health systems of LMICs (Matte, Bresnahan, Beggs, and Susser 2001; Black et al. 2003; Caulfield et al. 2004; Nandy et al. 2005; UNICEF 2006; Horton 2008; Crow and Lodha 2011; Renner 2011). In the meantime if LMICs are banking on the youthful populations to provide support for future socioeconomic development as their strategic plans portend, they need to manage the ongoing “nutrition transition”<sup>13</sup> by enhancing population diet (Hansford 2010; Subramanyam, Kawachi, and Berkman 2010; Weeks 2012). To complement these efforts, sociologists are suggesting a shift in research on child undernutrition to match children’s social realities with existing

---

<sup>12</sup>This refers to a presence of undernutrition, and an impending obesity crisis in the same population (de Onis and Blossner 2003; UNICEF 2006).

<sup>13</sup>This is a shift from high prevalence of undernutrition to predominance of diet –related non-communicable chronic disease (NCCD). It is associated with economic growth through technological change and rapid urbanization that is characterized by reduced physical activity in the work-place and leisure time, changes in food patterns to include increased consumption of energy-dense processed foods (Popkin 2001).

regional expectations (Smith and Haddad 2000; Potera 2004; Smith, Ruel, and Ndiaye 2004; Zottarelli et al. 2007; Crow and Lodha 2011).

A broad spectrum of recent research on LMIC contexts has found that relationships among contextual circumstances such as foreign aid, water shortages, inequality, and climate change seem to exacerbate child undernutrition (Rodeheaver et al. 1982; Krugman and Venebles 1995; Smith and Haddad 2002; Black et al. 2003; Benson and Shekar 2006; Clemens et al. 2007; Katona and Katona-Apte 2008; Shandra, Shandra, and London 2011; UNICEF 2014). Ultimately, various scholarly commentaries are encouraging the examination of these “assaults” on children as a way of inspiring more research into the subject to broaden the scope of analysis.

#### *Dimensions of Child Undernutrition*

The complexities surrounding the causes, occurrence and consequences of child undernutrition require multifaceted and multisectoral approaches to subdue it because no single factor can be attributed to the range of visible outcomes <sup>14</sup>(Ravallion 2001; Vollmer, Harttgen, Subramanyam, Finlay, Klasen and Subramanian 2014). In order to measure child undernutrition accurately, scholars have resorted to anthropometry which provides the standardized measures used internationally. This need for standardization provides objective measures to subdue the subjective meanings attached to nutritionally deficient children in LMICs.

Research by Komlos and Meermann (2007) indicates that as far back as 1829, height and wealth were being correlated to offer evidence of links between

---

<sup>14</sup> See Table 1 for the spectrum of projected lifelong outcomes.

anthropometry, development and economics.<sup>15</sup> In this dissertation anthropometry is the preferred measure gauging growth or failure to grow using body size as a proxy for children's nutritional status (Benson and Shekar 2006). Stunting, wasting and underweight are measures computed by comparing abnormalities of growth using normal children of similar age and sex in a standard nutritionally secure population (see details in Figure 1 below) (Peterson 2009). Decades of research in Asia, Africa, Europe and Latin America concede that stunting, wasting and underweight can also serve as economic markers indicating living standards and overall health serving therefore multiple purposes (Keusch 2003; Monteiro, Benicio, Conde, Konno, Lovadino, Barros, and Victora 2010; Walker, Chang, Wright, Osmond, and Grantham-Mcgregor 2015). Children with growth patterns who score more than two standard deviations (z-scores) below the mean physical characteristics for the nutritionally secure reference population are deemed undernourished and needing attention (Nandy et al. 2005; Zottarelli 2007). Unlike other development indicators that can be estimated from administrative data, undernutrition estimates in LMICs rely almost entirely on anthropometric data collected for household surveys in Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS) over time.

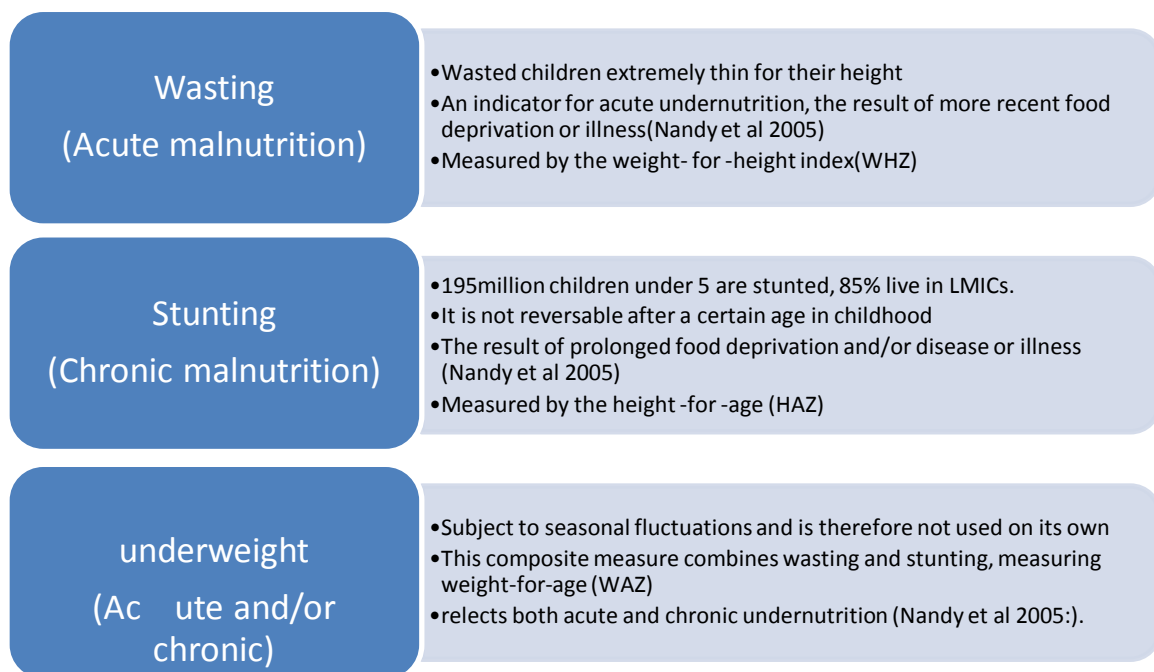
A substantial amount of longitudinal literature from LMIC countries demonstrates that anthropometric measures are sensitive enough to capture the essence

---

<sup>15</sup>Villermé (1829) concluded that taller men tend to be healthier and have career advantage (e.g. military service) over shorter men. Other scholars using similar premises include Berg (1970) in Komlos and Meermann (2007).

of the child undernutrition problem and thus should be enhanced through further use.

This suggests that the application of sociological perspectives in framing child undernutrition is useful (Vollmer et al. 2014). Figure 1 provides a detailed explanation of the anthropometric measures used to gauge child undernutrition globally.



**Figure 1. Anthropometric measures used to gauge child undernutrition globally**  
Source: <http://www.unicef.org/nutrition/training/2.3/13.htm>

### *Regional Trends*

Aside from the geographical similarities shared by LMICs, there are social, historical and economic resemblances that are used by some researchers to map the incidence of child undernutrition (Underwood 2002; Seligson and Passe-Smith 2008).

As would be expected, these contextual characteristics define LMIC regions allocating unique features to specific contexts. Researchers such as Underwood (2002) discussing health trends and institutional deficits in Africa, Latin America and the Caribbean, Eastern Mediterranean, Western Pacific, China, India and Mexico suggest that these unique features should be included in academic research on children whenever possible to enrich findings and improve relevance. To elaborate the significance of studying child undernutrition in the LMICs region with a topographic bias, Table 2 below details comparatively, nutritional deficits among children globally.

**Table 2: Estimated Prevalence of Selected Nutritional Deficiencies in Children under 5, by Region (Percent)**

REGION	Wt Age < 2SD	VITAMIN A DEFICIENCY	IRON DA DEFICIENCY	ZINC
East Asia/the Pacific	18	11	40	7
East Europe / Central Asia	6	<1	22	10
Latin America/ Caribbean	6	15	46	33
Middle/ North Africa	21	18	63	46
Sub Saharan Africa	32	32	60	50
South Asia	46	40	76	79
High Income Countries	2	0	7	5

Source: Renner 2011

Table 2 above suggests that there is a greater incidence of child undernutrition in LMICs, further corroborating the need for informed, timely and urgent research. However, the paucity of macro-analytic literature investigating the slow institutional

response to mitigate the homogeneous characteristics such as social inequalities, recurrent food shortages, erratic food pricing, humanitarian crises, conflict, insecurity and existing gender disparities characteristic of the regions explains to a large extent the prevalence of scourges that continue unabated (Jenkins and Scanlan 2001; Ivanic and Martin 2008).

Among recent studies using a contextual analysis to discuss child undernutrition is Smith and Haddad's (2000) regional comparative study explaining malnutrition in LMICs as a violation of children's human rights. Using women's status relative to men's, national incomes and food availability, they find variances across LMICs based on the ongoing "Asian Enigma"<sup>16</sup> in South Asia, and high poverty and disease rates in Sub-Saharan Africa (Black et al. 2003). However, they neglect to utilize broader definitions of women's status, found in the Gender Empowerment (GEM) and Gender Inequality measures (GI), as well theoretical arguments to support their conclusions (Smith and Haddad 2000; Klasen 2005).

## WOMEN'S STATUS AND CHILD UNDERNUTRITION

Women's status is a meta-concept typically ill-defined (Bradley and Khor 1993; Richards and Gellany 2007). Some trajectories of research have suggested that women's private and public spheres should be incorporated in the various definitions to

---

<sup>16</sup>Ramalingaswami, Jonsson and Rohde (1997) discussed the puzzle (enigma) in relation to the high undernutrition rates in South Asia compared to Africa. They proposed that the reasons for child undernutrition in South Asia were complex and obscured in the very nature of social relations. This they claimed accounts for the enigma.

account for cultural differences (Bradley and Khor 1993). Some research insists that a uniform definition of women's status across continents based on historical relevance will provide a basis for recommendations. However, other research argues that there are distinct differences that should always be acknowledged (Boserup 1970; Kent 2002; Mohanty 2003; Chant 2007; Peet and Hartwick 2009). In an attempt to take advantage of all these suggestions, this study operationalizes women's status as the respective position of authority within which women make social, political, and economic decisions.

Among LMICs research isolates two views of women's status. First, it is the condition of women, aligned to a collection of rights and duties.<sup>17</sup> Second, it is the placement of females relative to males in a two-leveled hierarchy (Sudarkasa 1986; Richards and Gelleny 2007; Slusser 2009). It is this second aspect of the definition that directly relates to the Human Development Index (HDI) and the Gender Empowerment Measure which are used in the analysis section of this study. This however does not necessarily mean that men are a reference point, but rather the differences among women in power, prestige or resources are being deliberated on their own (Mason 1986; Richards and Gelleny 2007). For example when the percentage of seats held by women in parliament is considered as a predictor for child undernutrition, it is not necessarily in comparison to the number of seats held by men but rather the number of seats among women as an entity.

---

<sup>17</sup> See the United Nations' *WomenWatch* webpage for a complete list of UN conventions on women <http://www.un.org/womenwatch/asp/user/list.asp?ParentID=1003>.

Two parallel views emerge on the perception of women's status in LMICs. In one, it has been anticipated that economic participation in the global trade arena has improved the lives of women and enhanced their status, suggesting that international economics has dictated women's wages and working conditions in a positive direction (Acker 2004; Deo 2006; Richard and Gelleny 2007). As such, the rise of MNCs has inspired increased income among women as a result of amplified status through employment. Evidence from South Korea, Singapore, Malaysia, and India indicates a narrowing gender gap in earnings (Ghosh 2001). Similarly in Latin America, employed women seem better off with poor wages working in EPZ factories than women with no work at all (Acker 2004; Deo 2006). In addition, humane employment practices now institutionalized by MNCs are directly benefitting women who have previously been victims of unfair labor practice (Richards and Gelleny 2007).

As a result, women are supporting welfare systems with their extra income by improving households and directly impacting child undernutrition (Quisumbing 2003; Kabeer 2003; Kabeer and Mahmud 2004). Microfinance research has indicated that microloans have assisted women to purchase water, health, and education, contributing to increased gains (Underwood 2002; Ahmad et al. 2000). This positive transformation by women is substantiated in literature which posits that women are as a result self-assured and assertive, and thus capable of controlling their children's health (Acker 2004; Deo 2006). Seemingly, economic global re-structuring has improved the status of women.



The competing view however, is more popular and suggests that for women in LMICs, global economics has rendered them worse off and the perception of an improved status is superficial (Spieldoch 2007). This is based on the extensive analyses of neoliberalism which literature shows has eroded welfare safety nets. By MNCs being interested in profit rather than the transfer of benefits, vulnerable populations are at greater risk.<sup>18</sup> In fact, wage gaps are increasing, and multinational food corporations are no longer supporting women farmers substantively because they are small scale. This is aggravating the “feminization of poverty” (Ghosh 2001; Kabeer 2003; Mohanty 2003; McMichael 2012; Akyeampong and Fofack 2013; Owusu-Afriyie and Nketiah-Amponsah 2014). Evidently women’s status has been restricted and diminished by these new arrangements (York and Ergas 2011).

These two opposing views, one of an improved women’s status and the other of a diminishing women’s status remain in contradiction as more research evidence is sought in support of either. Additionally, the negative effect of Structural Adjustment Policies (SAPs)<sup>19</sup> of the Bretton Woods institutions on women is emphasized in multiple studies focused on LMICs, but has been criticized as no longer relevant (Quisumbing 2003). Although the tendency among most LMIC entities is support for the improved status of women overall, critical reviews by scholars focusing on

---

<sup>18</sup>MNCs have also been associated with the “Race to the Bottom” whose effects are described by Karl Polanyi (1944) in his thesis “*The Great Transformation*” society becomes an adjunct to the market, and the market destroys society especially the ability to produce food and raw material.

<sup>19</sup>This is a term used to describe a set of measures from IMF and WB, persuading developing countries to devalue currency, deregulate prices, reduce public spending, remove food subsidies, liberalize trade, privatize parastatals, cut spending on social programs and restructure (Hoogvelt 2001; McMichael 2012)

situations in Asia, Africa and Latin America posit neoliberal trends as deleterious to women's status.

The historical progression of the women's movement is thought to have a hand in the current increase in status (Mies 1998; Hoogvelt 2001). The new field of women in development (WID)<sup>20</sup> coming after the launch of the Decade for Women in 1975, and the Gender and Development (GAD)<sup>21</sup> paradigm both have championed the mainstreaming of women in institutional structures (Mohanty 1991; Chant 2003). Especially relevant to the case in this dissertation is the question of whether women can now use their perceived improved status to engender pathways and mitigate child undernutrition.

### *The Millennium Development Goals*

The ongoing MDGs<sup>22</sup> have been criticized for their indirect approach to complex LMIC problems such as child undernutrition (King and Mason 2001; Birdsall, Levine, and Ibrahim 2005; Brown, Platt, and Beattie 2015). The first, second, third, fifth and seventh goals are indirectly targeted at child undernutrition by enhancing food

---

<sup>20</sup>This field was named by women's committee of the Washington DC chapter calling attention to Third World women's situation. It is liberal modernization theory calling support for welfare, equity, antipoverty, efficiency and empowerment. Ostensibly it is interested in bringing women into the development process (Hoogvelt 2001). Postmodern feminist critique argues that it presents Third World women as backward, vulnerable and in need of help from first world (Peet and Hartwick 2009; McMichael 2012).

<sup>21</sup> Originating in Sussex in the mid1970s, it is radical feminist in nature espousing women's emancipation. Gender relations are the analytical category as it supports women as social actors within wider constraining structures (Peet and Hartwick 2009; McMichael 2012).

<sup>22</sup>In September 2000, at the UN Millennium summit, 191 member countries agreed to a set of eight Millennium Development Goals for the world's poor nations (Amin 2006). The strategies have provided a framework for economic and social development in LMICs (A/RES/55/2, 18 September 2000).

security to positively impact the quality and quantity of children's diets (Afridi 2010). However at the time of this writing with only a few months remaining to the end of the Millennium Development Goal Period (2000-2015), there is still no clear indication of exemplary results of children's improved nutrition.

*Child Undernutrition, Women's Status, and Economic Development*

The World Bank estimates that 3.14 billion people (over half the world's population) currently live in LMICs where negative growth has occurred since the mid-1980s (Smith and Seligson 2008). A plethora of research cites this negative growth with few alternatives as the reason for increased vulnerability among women and children (Monshipouri 2014). According to the Bretton Woods institutions, the only way to turn this around is to improve national economic growth rates through investment and borrowing, both of which put children at a disadvantage (Clemens et al. 2007; Seligson and Passe-Smith 2008; Stiglitz, Sen, and Fitoussi 2009; Subramanyam, Kawachi and Berkman 2011; Moseley, Carney, Becker, and Hanson 2010; UNICEF 2013; Vollmer et al. 2014).

There is now an opposing trend emerging with evidence claiming that economic growth is not a panacea, citing cases where economic growth inspired by the state is neither providing solutions to problems of poverty nor child undernutrition (Frank 1979; Kuonqui 2006; Kostovicova and Bojicic-Dzelilovic 2009; Subramanyan et al. 2011; Heady 2013; Anderson 2014). In other words, these scholars are challenging the equation which states, economic growth= wealth= health (Prichett and Summers 1996).

Their skepticism notwithstanding, economic systems as currently constituted in LMICs mirror the hierarchy of control described by the world systems perspective which argues in favor of trade liberalization. Trade liberalization is characterized by abolishing price and import controls, giving more access to foreign multinationals, reducing government expenditure on social welfare, increasing user fees and supporting the retrenchment of workers, all of which indirectly impacts children (Wallerstein 1974; Storey 2000; Hoogvelt 2001; Shandra et al. 2011; McMichael 2012; Weeks 2012).

Even though economic prescriptions from the core seem to be eroding local “interdependence” and “social solidarity,”<sup>23</sup> international institutions are being viewed both by scholars and policy makers as co-conspirators in the preservation of child undernutrition (Milanovic 2005; McMichael 2012; UNICEF 2013; Gane 2014). To counter this, alternative suggestions propose the creation of a “human development enabling state” which includes women as a necessity for community well-being (Kuonquii 2006; Anderson 2014). Unfortunately the numerous historical, cultural and economic contradictions existing within the socio-economic contexts of LMICs are in themselves impediments to the reception of many alternative strategies (Seligson and Passe-Smith 2008; Crow and Lodha 2011). The lack of empirical evidence among research of the positive role women can play using existing economic systems to eradicate child undernutrition may be one reason for the halfhearted response (Easterly 2001; Pfeiffer and Chapman 2010; Minujin and Nandy 2012). This is despite a

---

<sup>23</sup> Referenced in Durkheim’s sociology as necessary ingredients for well-being (Durkheim 1947).

generous amount of literature suggesting that LMICs should depend on human capital as the potential driving force in socio-economic development because this approach directly includes women and children (Isbister 2001; UNDP 2010; Anderson 2014; Marsh 2014; Monshipouri 2014).

## LOW AND MIDDLE INCOME COUNTRIES AND CHILD UNDERNUTRITION

It has not escaped social scientists in particular that at the dawn of the 21<sup>st</sup> century social catastrophes in LMICs are exacerbated by the reciprocal effects of events. Groups of scholars list child undernutrition among many other problems facing LMICs (Smith and Haddad 2000; Underwood 2002; Crow and Lodha 2011). For example South Asia, Sub-Saharan Africa, East Asia, and Latin America are characterized by a unique set of circumstances including but not limited to imperialism, poor economic infrastructure limiting growth, state insecurity, social inequalities, greater disease burden, health disparities and inadequate water sources (Isbister 2001; Underwood 2002; Seligson and Smith 2008; Habimana et al. 2010; Handelman 2013). Suffice it to state that LMICs have pockets of homogenous contexts because of their cultural, political, historical and economic similarities (Hoogvelt 2001; Seligson and Passe-Smith 2008; Peet and Hartwick 2009; McMichael 2012; Monshipouri 2014).

Current extant literature alleges that child undernutrition is operating in concert with other determinants in the social systems which potentially intensifies the chronic circumstances such as the proliferation of contaminated water for domestic purpose (Vollmer et al. 2014; Aulette and Wittner 2015). The homogeneity of LMICs which is confined in many cases to low GDP per capita, highly unequal income distribution,

poor infrastructure, export led growth, unemployment, and underdeveloped housing exacerbates all problems within the social structure (Milanovic 2005; Renner 2011; Handelman 2013; Anderson 2014; Monshipouri 2014).

Indeed, while chronic undernourishment according to FAO estimates has fallen worldwide, trends in LMICs have remained stagnant and in some areas even increased (Rosegrant and Cline 2003; Spieldoch 2007; Cai and Brown 2011). As a result, evidence from nationally representative samples across the world predicts dire consequences for children born in any LMICs considering that emerging disparities among states also reflect internally deteriorating conditions (Victora et al. 2008; Crow and Lodha 2011; Anderson 2014).

#### *Historical Structures in LMICs and Child Undernutrition*

Many of the LMICs share a history of colonialism, an experience that has put them on similar post-colonial trajectories, and inextricably linked them to their mainly European colonizers (Hoogvelt 2001; Seligson and Passe-Smith 2008; McMichael 2012; Peet and Hartwick 2009; York and Ergas 2011). Trajectories of thought seeking to explain the contradictions of postcolonial environments as accounting for the present economic, social and political disparities have also emerged (Clemens et al. 2007). These contradictions remain interesting because they extend their influence to gender relations and the production of food (Hoogvelt 2001; Whitehead and Kabeer 2001).

Present day subsistence economies have gendered labor and encouraged migration of men and women from the rural areas where food is produced. In this way, social systems have essentially linked women and children to neoliberal structures,

which have eroded safety nets. In addition, there is little knowledge that child undernutrition and gender disparities are consequences to contend with as these new arrangements replace the traditional ones (Whitehead and Kabeer 2001; Sewpaul 2005).

New systems of export agriculture instituted by colonial regimes across LMICs have disrupted diets such that what is cultivated is not necessarily what is eaten. Similarly, there has been alteration in land use and ownership, that has gradually lead to a decline in agricultural employment from 74 percent in 1965 to 57 percent in 1998 and a subsequent loss of user rights for women (Ng and Aksoy 2008; Peet and Hartwick 2009; Crow and Lodha 2011; McMichael 2012). Literature over the years cites debt and developmentalism as evidence of the dependency systems inherent among LMICs. The effects of privatizing debt in the 1970s led to situations where periphery countries would be remitting capital outflows to core countries of greater value than what is owed. The effects of which are still being felt currently (Hoogvelt 2001; Clements, Bhattacharya and Nguyen 2003; McMichael 2012). Per capita incomes have thus been in decline since the 1980s, attracting the intervention of the World Bank and International Monetary Fund (IMF), leading to further impoverishment of LMIC economies and reinforcing codependence (Hoogvelt 2002).

#### *Child Undernutrition and Social Conditions in LMICs*

A small body of work on LMICs shows that due to factors such as access to education, wealth, household size, clean water, sanitation, access to primary care, level of disease prevalence, and culturally driven beliefs, there is significant variability in

children's well-being (Katona and Katona-Apte 2008; Minujin and Nandy 2012; Handelman 2013; UNICEF 2013; Pei et al. 2014). On different continents, children's advantages and disadvantages will differ. However, despite these differences, research into children's survival and well-being finds LMICs having disconcerting rates of undernutrition, and a higher incidence of mortality, morbidity and stunting (Caulfield et al. 2004; Walker, Rudan, Liu, Nair, Theodoratu, Bhutta, O'Brien, Campbell, and Black 2013; UNICEF 2013).

This dissertation develops a trajectory of original thought by linking child undernutrition as a social problem<sup>24</sup> arising out of institutionalized regional and gender inequalities present in LMICs (Peet and Hartwick 2009). This attempt is supported by a growing awareness in literature that social problems are a hindrance to economic progress and detrimental to human development (Alkirie 2002; Black et al. 2003; de Onis and Blossner 2003; Kuonquii 2006; McMichael 2012; Vollmer et al. 2014).

While some research considers poverty as the only legitimate entry point, other research prefers the disease approach which supports medicalization because it assumes that there is a synergistic relationship between mortality, morbidity and child undernutrition (Peterson 2009; Meade and Emch 2010; Minujin and Nandy 2012; UNICEF report 2013). However, this medicalized approach remains controversial among experts some of whom claim that giving medication to poorly nourished children is unsustainable.

---

<sup>24</sup>A social problem is considered by sociologists as a situation that needs to be acted upon and altered because it is incompatible with general values of a population (Rubington and Weinberg 2011).



Only recently has alarm been raised on the dangers of stunting, initiating serious approaches of inquiry because it is a public health issue (Monteiro et al. 2010; UNICEF 2013, Walker et al. 2015). Stunting is irreversible, intergenerational and lowers self-esteem (UNICEF 2006; Black et al. 2008; Horton 2008). In Zimbabwe it is associated with a seven month delay in school completion and reduces lifetime income by 7 to 12 percent (Benson and Shekar 2006). Additionally, other consequences of undernutrition found in longitudinal studies from South America, India and South Africa are poor school attendance, poor academic performance and obesity (Jenkins and Scanlan 2001; Black et al. 2008; Clemens et al. 2007; UNICEF 2013; Shandra et al. 2011; Subramanian et al. 2014).

Educated mothers have been cited as one way of improving children's nutrition. One seminal example in current research among LMICs of the positive influence of high literacy rates is found in Kerala, India where in the last decade alone, child well-being has improved because of the education aspect which has improved women's status (Sen 1999; Mukherjee, Chaturvedi, and Bhalwar 2008). Female education remains an adequate proxy because educated women are conscientious about hygiene and breastfeeding, have smaller household size are less constrained by cultural practices, and autonomously make decisions (Rana and Raza 2014). Suffice it to mention a few mixed results from Nigeria, Zimbabwe, Mozambique, Vietnam and some parts of Bangladesh where women's education remains less important and has negative effects on child growth. This is because educated women are known to spend more time in formal employment leaving their children with caregivers who may not

have vested interests nor requisite skills to provide adequate child care (Ukwuani and Suchindran 2003; Hien and Hoa 2009). The foregoing debates provide lucrative research avenues.

## THEORETICAL FRAMEWORK

The gender stratification and the world systems perspectives provide an interface for the empirical analysis of child undernutrition in LMICs. This dissertation envisions LMICs as intrinsic entities on the one hand, and collaborative partners on the other. Sociologists who argue on the basis of these two perspectives imply the existence of structurally embedded systems of inequality in which there is a “power wielder” and “compliant subject” (Chirot and Hall 1982; Croteau and Hoynes 2013). With reference to Wallerstein,<sup>25</sup> (1979) global partnerships are defined by a hierarchical arrangement of economic relationships among core, periphery and semi-periphery nations as opposed to horizontal arrangements (Bornschier, Chase-Dunn and Rubison 1978; Frank 1979; Shen and Williamson 1997; Peet and Hartwick 2009). This global pattern of relations replicated by a regional stratification system that supports a similar system of gender hierarchy (Hoogvelt 2001). These simultaneous sociological views are cited in literature as ancillary to the current trends of rising inequality in LMICs (Hoogvelt 2001; Seligson and Passe-Smith 2008; Crow and Lodha 2011; Croteau and Hoynes 2013).

---

<sup>25</sup> Wallerstein uses “world system” as a single division of labor comprising multiple cultural systems, multiple political entities, and even different modes of surplus appropriation (Hoogvelt 2001). He ties it to the world capitalist system with origins in the 16<sup>th</sup> century

Juxtaposing these two perspectives to conceptualize and contextualize the prevalence of child undernutrition in LMICs as an outcome of dependence chains, neoliberal systems and internally based socio- structural gender arrangements of a post-colonial epoch. These perspectives highlight child undernutrition as one of the “paradoxes of development” whose dire consequences have been normalized (Frank 1979; Hoogvelt 2001; Chant 2007; Peet and Hartwick 2009; Pfeiffer and Chapman 2010; Shandra et al. 2011; Vollmer et al. 2014; Aulette and Wittner 2015). Other paradoxes include the “feminization of labor”<sup>26</sup> (Chant 2007) which occurs when employment is gendered, and the “race to the bottom”<sup>27</sup> in which LMICs become multinational investment havens (Drezner 2000; Acker 2004; Richards and Gelleny 2007; Peet and Hartwick 2009). Although there is a large amount of extant literature presently explicating the paradoxes of development hardly any has objectively tackled child undernutrition or women’s status as a consequence or an outcome of these stratified arrangements.

#### *Wallerstein’s World Systems Perspective*

Wallerstein’s (1974, 1979) world systems perspective focuses on the global interdependence among states in a single economic system, and reiterates the hierarchically calculated relations among them. States are patterned into a system

---

<sup>26</sup> This term is used in two ways, first as reference to the rapid and substantial increase in the proportions of women in paid work in the last two decades. Second, it describes the flexibilization of the labor an irregular condition once thought to be the hallmark of women’s employment (Chant 2007).

<sup>27</sup> The term refers to a hypothesis where countries lower their labor standards, environmental standards or tax rates to attract foreign capital. Origins of the phrase can be traced back to U.S Supreme Court Justice Louis Brandeis in his dissenting opinion in *Liggett vs Lee* where he describes how firms were formed in the US preferring “States where the cost was lowest and the laws least restrictive” “which led to a race not of diligence but of laxity” (*Louis K. Liggett Co vs Lee*, 288 U.S. 517, 1933).

designating them as core, periphery, and semi-periphery based on their function in a capitalist world economy (Chirot and Hall 1982; McMichael 2000; Hoogvelt 2001; Mahutga and Smith 2011; Croteau and Hoynes 2013). Core states are those that not only receive the largest share of profits, but also determine global economics, politics, social trends, and global decision making through structured organizations such as the IMF (Das, Papaioannou, and Trebesch 2012). They are wealthy, deriving most of their benefits from their former colonies (Sen 1985; Krugman and Venebles 1995; McMichael 2000; Peet and Hartwick 2009). The semi periphery category includes China, India, Mexico, and Pakistan, whose strong domestic industrial base has developed over time and ensures that they are better integrated with core countries. Lastly, the periphery states are those subject to extraction. They are the world's poorest and least powerful residing on the fringe of the global economy, relegated to providing raw materials, natural resources, and cheap labor markets for goods (Krugman and Venebles 1995; McMichael 2000; Shandra et al. 2004; Peet and Hartwick 2009).

Sociologists use this abstract pattern to classify Wallerstein's perspective as a meso-and macro-level theory of change. Another group of sociologists links its assumptions to Karl Marx's conflict theory in which the socio-economic class conflict is perpetuated by capitalists controlling the means of production (Mohanty 2003). As a collocation they label Wallerstein's perspective a branch of conflict theory based on the similarities within core nations who are considered the owners of the means of production. Yet development sociologists also classify it further as a dependency

theory owing to the fact that change in the periphery only occurs when the core decides it should (Peet and Hartwick 2009).

Wallerstein's arguments posit that the poverty of some countries is connected directly to the wealth of others firmly establishing state relations as capitalist in nature because of an emerging international bourgeoisie alongside an exploited international proletariat (Hoogvelt 2001). In practice, to facilitate extraction, transnational enterprises occupy domestic spaces under agreements which few LMICs fully understand. The picture painted is one where employment and profit is proposed to the periphery by the core, but in reality, the periphery never has any say on the amount of profit, and the employment is undervalued (Isbister 2001). A proliferation of research now links the inbuilt global inequality to the ever increasing vulnerability of children among the periphery nations (Gwatkin 2000b; McMichael 2000; Peet and Hartwick 2009; York and Ergas 2011; Minujin and Nandy 2012).

Indeed, the rich and growing body of quantitative empirical work on the world systems perspective essentially captures its advantage over other conflict perspectives. Mainly, it facilitates a comparative study of the global system in regional parts which is advantageous to this study by providing a conceptual lens through which observations can be made, and conclusions arrived at. Essentially by applying the worldwide division of labor to multiple cultural systems a panoramic view of various situations is implied and these can be used to analyze a range of social conditions (Jorgenson, Dick, and Shandra 2011; Peet and Hartwick 2009; Mahutga and Smith 2011). For example, this perspective demonstrates how capital penetration has led to partial economic

growth and exploitation of cheap labor, perpetuating dependency and the marginalization of the masses (Hoogvelt 2001). Also, it highlights the real essence of the loans issued by Bretton Woods institutions demanding cuts in spending on public programs that ultimately has led to among other things the elimination of subsidies for food and fertilizers, currency devaluation which increases prices of imported items, and food shortages which have all stoked undernutrition (Shandra et al. 2010; McMichael 2012). What this means is that economies of the periphery have become dependent on international markets over which they have no control, ultimately leading to a reliance on foreign investment which negatively impacts economic growth and entrenches inequalities of access and opportunity (Bornschiefer and Chase-Dunn 1978; Hall 2000; Dunaway 2001; Chant 2007; Sewpaul 2005; Crow and Lodha 2011; York and Ergas 2011).

Based on a capitalist ethos, some of the social effects of this hierarchy of relations include women's loss of their vital role in traditional economies, and their subsequent inability to meet their economic needs even when they participate in wage labor because of the "feminization of labor" (Hoogvelt 2001; Chant 2007; McMichael 2012). According to recent research, women's access to economic opportunities and resources has not only become limited, but they are now pushed into low wage jobs whose remuneration is insufficient based on lop-sided MNC negotiation (Monshipouri, Welch and Kennedy 2003; Chant 2008; Chant and Sweetman 2012). The integration of LMICs into the world division of labor is therefore not without consequence to women and children (Bradshaw 2013; Brown et al. 2015).

### *Gender Stratification Perspective*

A substantial amount of literature posits global changes as positively impacting social structures which in turn transform women's life chances and increase their spheres of influence in LMICs (Wermuth and Monges 2002; Gawayaya 2008). While a plethora of research acknowledges that women often occupy lower status and have less power than men because of patriarchy, there is not enough evidence adduced to incorporate the assumptions of global effects (Aulette and Wittner 2015). It is easier to blame cultural contexts and colonial systems, concluding that the disruption of social systems by colonialists has been detrimental, mainstreaming gender subordination and contradicting the pursuit of gender equality and empowerment (Crow and Lodha 2011).

Pervasive gender inequalities are threatening decades of effort encouraging women to get an education, work, and be autonomous (Aulette and Wittner 2015). Indeed, a number of sociologists mapping current trends using a classical approach argue that gender stratification is a part of conflict theory and when it is condoned, inequalities thrive. Using the writings of the classical conflict theorists, sociologists contend that men's roles are dominant while women's are subordinate because capitalism reinforces the dependence of women in private and public spaces including employment. Another group of scholars argues that focus should not be on subordination but opportunity given, and so based on the reality in LMICs, women are given opportunity in employment which is better than none at all (Mohanty 2003; Sewpaul 2005; Akyeampong and Fofack 2013). Notably, more women are accessing

education and completing school, and now even more are sharing political power through parliamentary quotas (Bauer 2012b). All these opportunities availed to women are potential avenues for status benefits that should promote child well-being and prevent undernutrition but this is not the case (Rostow 1990; Jenkins and Scanlan 2001; Kent 2002; Yoon 2004; Shandra et al. 2011; Kent 2002).

While the foregoing discussion indicates positive outcomes, emerging paradoxes are competing with these ideal situations to foster contradiction. For example, the highest unemployment rates are found among women, more women are in low skilled labor, and many are at the risk of losing their jobs. All these factors inhibit women's autonomy (Jejeebhoy 2002; Aulette and Wittner 2015). Cynthia Enloe's research indicates that corporate strategies depend on local constructions of femininity (McMichael 2012). Thus, if gender stratification is institutionalized, MNCs simply replicate these existing structures by keeping women in subordinate positions and paying them lower wages than men. Here lies the genesis of many setbacks passed on to children, further illustrating that gender stratification is both a cause and consequence of social inequality (Marsh 2014).

Recent research concurs that gender stratification is a complex concept lending perspective to the way in which opportunities, power and privilege are institutionally legitimized in society (Lenski 1966). Therefore, using the gender stratification perspective, this study examines the extent to which child undernutrition is exaggerated by these antagonisms in the existing social structure (Shen and Williamson 1997; Peet and Hartwick 2009; Shandra et al. 2011). Additionally, explanations of gender



stratification hinge on the fact that it is culturally relevant and therefore sufficient for regional analysis. Notwithstanding the macro and meso differences in perspective, both frameworks adequately represent the stratified social systems within LMICs capturing nuances of hierarchy and inequality (Chant and Sweetman 2012).

## RESEARCH QUESTIONS AND HYPOTHESES

The social and economic cost of child undernutrition indicates ramifications to the human capital investment plans of LMICs. This dissertation addresses the following research questions and hypotheses using the gender stratification and the world systems perspectives as frames of reference. The first research question asks, “To what extent is the improved status of women engendering pathways to diminish the prevalence of child undernutrition in LMICs?”

Recent literature illustrates the inclusion and participation of women in economic, social and political institutions through advocacy as progressive and beneficial for children, societies and nations (Aulette and Wittner 2015). However while it is known that women will engage diverse methods to ensure the well-being of their children, the inability to balance these structural gains and the social realities of marginalization may provide some insight into the prevalence of child undernutrition in the region. Indeed among LMICs, although women are now more independent and autonomous because of access to education, employment and political representation (Kabeer 2003), these changes remain obscured and impotent because of gender stratification norms, cultural contradictions, and the “feminization of labor” (Chant 2007; Mohanty 2003; Gaway 2008; Peet and Hartwick 2009; Smith and Haddad

2012; Akyeampong and Fofack 2013; Aulette and Wittner 2015). Scant consideration has been given to empirical, cross-national studies concerned with the relationship between women's status as a predictor of child undernutrition across the social, political, and economic spheres. To predict child undernutrition, the following hypotheses are tested:

**H1:** Among LMICs there is a significant inverse relationship between women's empowerment and the prevalence of child undernutrition controlling for all other variables.

I hypothesize that since women in LMICs currently have higher social, economic and political status than their predecessors as portrayed in recent literature, implies that they are empowered, have better health, longevity, and increased income which should be useful in decision making on nutritional matters enabling them to alleviate child undernutrition (Kabeer 2003; Acker 2004; Chant 2007;Gawaya 2008).

**H2:** Controlling for women's autonomy and political power, as women's vulnerable employment increases, child undernutrition also increases.

Literature indicates that more women are engaged in underemployment and vulnerable employment. The latter is considered precarious because it increases susceptibility to dangerous situations and it is impermanent. This has given rise to the "feminization of labor." Women have taken on vulnerable employment out of necessity. Examples are, low-paying factory assembly line work, small scale agricultural labor, piecework prostitution to supplement low wages, sex work, and domestic service. Despite these "opportunities" to earn income, women in vulnerable

employment are more likely to suffer from poverty (“feminization of poverty”) (Hoogvelt 2001; Schneider, Roberts, and Korgen 2015). Research by Kabeer (2003), and Akyeampong and Fofack (2013) indicate that these conditions are facilitated by local and foreign employers in search of investment and profit. These firms cite compliance with state regulations, and a new global division of labor.

**H3:** Among LMICs there is a statistically significant positive association between gender development and the prevalence of child undernutrition controlling for all other variables.

I hypothesize that the constituent components of gender development namely, education, life expectancy and estimated income, and emergent disparities between women and men in terms of education, life expectancy and estimated income negatively impact child undernutrition (Mies 1998; Hoogvelt 2001).

The second set of research hypotheses are derived from the literature pertaining to the second question which asks, “Why is child undernutrition prevalent in LMICs?” This is despite extant research indicating recent economic growth and a rise in foreign investment. According to the World Bank report (2014), there is every indication that the LMIC region is the fastest growing with greater economic potential than all other regions. LMICs posting improvements in national incomes, the status of women, and an overall better quality of life for citizens. Thus, I expect that increased income and improved provision of services will diminish child undernutrition (Stiglitz, Sen, and Fitoussi 2009; Amin et al. 2015).

**H4:** Regional inequality has a statistically significant and positive relationship with the prevalence of child undernutrition, controlling for all other variables.

I hypothesize that the rising inequality gaps among LMICs are a result of rapid social change, industrialization and poor policy conception, which have subsequently widened gender gaps and created antagonistic relations (Klasen 2005). Research shows that widening inequality gaps do little to avert child undernutrition (Crow and Lodha 2011). As LMICs seek investors and grow businesses they are likely to overlook children, who then risk losing about 10% of their lifetime earning potential when they encounter undernutrition (Easterly 2001; Peet and Hartwick 2009; Marsh 2014).

**H5:** As international integration through trade increases, the prevalence of child undernutrition also increases, controlling for all other variables.

Extant research in the social sciences provides evidence that links trade openness leads to subsequent intertemporal flows and asymmetric exchanges which remain unbalanced and unfair towards LMICs following the adjustment programs of the 1980s (Wallerstein 1974; Frank 1979; Shen and Williamson 2001; Easterly 2002; Seligson and Passe-Smith 2008; Peet and Hartwick 2009; Shandra et al. 2011; McMichael 2012; Amin et al. 2015).

**H6:** Among LMICs there is a statistically significant and positive relationship between multinational penetration (MNC) and child undernutrition controlling for economic growth and population growth.

I hypothesize that investment by MNCs predicts child undernutrition given that emerging empirical studies cite child undernutrition as an example of adverse

outcomes (Shen and Williamson 1997; Makki and Sonwaru 2004; Shandra, Shandra, and London 2010; McMichael 2012).

**H7:** Among LMICs there is a statistically significant positive relationship between external debt and child undernutrition controlling for all variables in the model.

Theoretical cross-national literature suggests that foreign borrowing has a positive impact on investment and growth up to a certain threshold level beyond which negative consequences such as child undernutrition begin to occur (Clements et al. 2003; Seligson and Passe-Smith 2008).

**H8:** Controlling for all other variables in the model, among LMICs there is a statistically significant and positive association between the prevalence of contaminated water sources and child undernutrition.

The World Bank (2014) acknowledges that poor resources and poor resource management causes water insecurity. The lack of water is one of the greatest challenges facing LMICs, which is expected to worsen (Tumwine, Thompson, Katua-Katua, and Mujwajuzi 2002; Mangyo 2008; Shandra, et al. 2011). I hypothesize that the presence of poor natural resources especially contaminated water predicts the prevalence of child undernutrition.

## CHAPTER III

### METHODS AND DATA

This chapter describes the methods and data used in this dissertation including the choice of variables, dataset and measurements, and the process of data collection and data analysis.

#### DATA

##### *Sources and Sample*

The primary focus of this dissertation is to investigate the viable pathways of influence engendered by women's improved status and homogeneous state contexts on the prevalence of child undernutrition in LMICs. Data for the variables in this dissertation have been purposely derived from multiple sources to constitute a dataset, using the year 2013 as a threshold. The dependent variable (child undernutrition) comprising estimates for stunting (height- for- age: HAZ), severe wasting (weight- for- height: WHZ) and underweight (weight- for- age: WAZ) is derived from the World Indicators survey database of the World Bank. For each of these variables, the year 2013<sup>28</sup> is used as a threshold in this cross sectional study. Where cases of missing data arose, the multiple imputation technique<sup>29</sup> was applied to statistically to compensate for missing

---

<sup>28</sup>This year has been used as a benchmark for evaluation of each of the 8 goals by the UN for the MDGs implementation period set to expire in 2015.

<sup>29</sup>I use the multiple imputation method because it results in correctly estimated standard errors and confidence intervals, as opposed to the single imputation method where only one estimate is used

data. Missing data occurred because most LMICs conduct nationally representative nutrition surveys infrequently with uneven time intervals which add to the poor data collection record (Acock 2005, Donders et al. 2006; Jorgenson et al. 2011). Donders et al. (2006) support using the multiple imputation method which prefers several estimates as a legitimate technique for handling missing data. It is based on the idea that any subject in a study sample can be replaced by a new randomly selected subject from the same source population. The data are based on the WHO's new child growth standards released in 2006, and the Global Database on Child Growth and Malnutrition. Aggregation of the data is based on UNICEF, WHO, and the World Bank harmonized dataset (adjusted, comparable data) and methodology (Catalog Sources World Development Indicators). Ultimately, a robust dataset comprising the dissertation's dependent, independent and control variables was constituted from multiple sources (see Table 4 for a full listing of study variables and corresponding data sources).

Using an approach similar to that of Jorgenson (2006) and Smith and Haddad (2002), I draw from the World Bank Development Indicators repository (WDI) a total of 139 countries classified as low, lower-middle, middle income and upper-middle income by the World Bank. This classification represents the bottom three income quartiles computed by the World Bank income quartile classification (see full list of selected countries in Appendix A) after excluding countries that presented no data for

---

resulting in small estimated standard errors. In addition, it has an advantage over the overall mean imputation technique and the missing indicator methods which almost always lead to biased estimates.

my dependent variables. These countries excluded were small islands without any information on stunting, wasting and underweight for the year 2013, and other previous decades. This WDI source is the primary World Bank collection of development indicators over a range of topics, maintained since 1960, and assembled from officially recognized international sources. It presents the most current and accurate global development data available, and includes national, regional and global estimates. It is highly reliable because it is frequently updated (<http://databank.worldbank.org/data/home.aspx>). One advantage of using LMICs as a classification system for this research is that this cluster of countries provides multiple homogeneous features apart from country income to support my thematic data analysis. Other variables drawn from the WDI repository consist of independent variables: vulnerable employment, dependency (external debt, external trade and multinational penetration) and regional inequality. In addition, three control variables measuring economic growth, women's autonomy and the population growth rate were drawn from this dataset.

From the United Nations *Human Development Report* 2008, I draw data to use as a proxy for one of the women's status variables namely, the Gender Empowerment Measure (GEM), while from the *Human Development Report* 2013; I draw a measure for the second proxy of women's status known as the Gender Development Indicator (GDI). Both of these measures are introduced in UNDPs Human Development Report (1995) and have been used liberally in various social science studies. These data are of an interval-level pooled cross sectional time series nature and are of high quality



(Richards and Gelleny 2007). These measurements add a gender-sensitive dimension to the Human Development Index (HDI) drawing attention to matters pertaining to the socio-economic contribution of women as separate entities from men. GEM is a measure of inequalities between men's and women's opportunities in a country. It combines inequalities in three areas: political participation and decision making, economic participation and decision making, and power over economic resources. It is derived from calculating percentages for females and males in each of the three areas, and then combined into an Equally Distributed Equivalent Percentage (EDEP) that rewards gender equality and penalizes inequality. Thus, GEM is the unweighted average of the three Equally Distributed Equivalent Percentages (Crow and Lodha 2011; Human Development Report 2013). The second proxy for women's status namely the GDI, measures gender gaps by computing life expectancy, school enrollment (education) and logarithmic transformations of per-capita income. It is considered a "gender-sensitive" extension of the Human Development Index (Klasen 2006). I use the two measures together because of two things. One, the indexes they compute differ and two, using only one leaves out critical information relevant to this study. For example, the Gender Empowerment Measure excludes women's education, while the Gender Development Indicator excludes political participation (UNDP 2008).

To determine a state's commitment to children's well-being through a demonstration of consideration for women's rights, I use Freedom House's annually published index of democracy 2000-2012. This index ranks countries by political and

civil “freedoms” aggregating questions taken from the Universal Declaration of Human Rights (Freedom House 2012).

Apart from the foregoing sources, I also use the Inter Parliamentary Union database PARLINE which contains information on the structure of parliamentary chambers globally. I focus on the lower house which has more female legislators from the lower house and whose data are representative and complete (<http://www.ipu.org/parline-e/parlinesearch.asp>). Finally, the Central Intelligence Agency (CIA 2008) fact book provides information on the prevalence of contaminated water sources within LMIC contexts (<https://www.cia.gov/library/publications/the-world-factbook/>).

#### *Data Collection*

All the aforementioned data sets are open access, publicly available, freely downloadable and de-identified in accordance with requirements. These frequently updated sources adequately support my data needs because they have complete information, and capture up to date situations on the status of women and the regional as well as within states contexts. A detailed explanation outlining the salience of selected variables follows below.

#### VARIABLES AND MEASUREMENTS

Variables of this dissertation have been purposely selected to align with the world systems and gender stratification perspectives as a precursor to the thematic discussions on child undernutrition to be undertaken after the testing of hypotheses. Thus, the choice of variables was based on suitability and availability of cases. All

variables have been examined for skewness following which the dependent variable(s) have been transformed into z-scores. The nine independent variables are logged to correct for skewness and to reduce the impact of outliers using the  $\log_{10}$  transformation feature in SPSS (Tabachnick and Fidell 2013) (see Table 5 for details of transformed indicators).

#### DEPENDENT VARIABLE(S)

Child undernutrition is the dependent variable in this dissertation, comprising three measures which together indicate whether a child is undernourished or not. I shall make reference to these measures as dimensions because each is unique in the way it is constituted. Yet when taken together the measures provide an in-depth understanding of failure to grow and thrive physically and mentally. The three dimensions are stunting (*height-for-age: HAZ*)<sup>30</sup>, severe wasting (*weight-for-height: WHZ*)<sup>31</sup> and under-weight (*weight-for-age: WAZ*)<sup>32</sup>. This dissertation uses all three measures with the aim of achieving robust results. Thus in the case of each hypothesis, I will regress the independent variables on each of the three dimensions of the dependent variable.

---

<sup>30</sup>HAZ indicates child undernutrition prevalence among the percentage of children under age 5 whose height for age (stunting) is more than two standard deviations below the median for the international reference population ages 0-59 months. For children up to two years old height is measured by recumbent length. For older children height is measured by stature while standing (Catalog Sources World Development Indicators).

<sup>31</sup>WHZ indicates child undernutrition by computing severe wasting prevalence as the proportion of children under five whose weight for height is more than three standard deviations below the median for the international reference population ages 0-59 (Catalog Sources World Development Indicators).

<sup>32</sup>WAZ refers to children being underweight and prevalence is computed by the percentage of children under age 5 whose weight for age is more than two standard deviations below the median for the international reference population ages 0-59 months (Catalog Sources World Development Indicators).

The World Bank data set provides these three measures as the variable labelled “malnutrition,” of which undernutrition is a subset. Previous studies have resorted to a similar strategy of utilizing all three measures (Smith and Haddad 2000), but recently smaller studies seeking to investigate child undernutrition are using stunting only as a reliable measure since the information is readily available (Monteiro et al. 2010; UNICEF 2013).

Underweight is a composite measure of WHZ and HAZ, and has aptly been used as a sole indicator in some studies because it synthesizes stunting (identifying long-term growth faltering) and wasting (identifying acute growth disturbance) (Zottarelli et al. 2007; Smith and Haddad 2002). While, a few scholars seemingly support the use of one out of the three measures claiming that using all the measures together may lead to instances of overlap, international standards suggest the use of all three measures as a way of arriving at concrete outcomes and development of comprehensive policy (Nandy et al. 2005; UNICEF 2013; Pei et al. 2014).

In this dissertation I standardize the percentage measures offered by the WDI further by transforming them from raw scores into z-scores, so that the value of the z-score tells me exactly where the score is located relative to all the other scores in the distribution (Nachmias and Guerrero 2006). This transformation further reduces the incidence of faulty estimates (Nandy et al. 2005; Pei et al. 2014). Using the normal distribution curves provided by SPSS, I check for skewness and correct for this before proceeding with the transformation into z-scores. Where data are missing, I use the

multiple imputation technique to legitimately derive cases for consideration in the dataset (Donders et al. 2006).

To identify the most appropriate predictor variables to use for this dissertation, I used the two theoretical perspectives as a frame of reference and to maintain thematic cohesion. The women's status variables are framed by the gender stratification perspective while the regional context is framed by the world systems perspective. Both the dependent and independent variables used in this dissertation are drawn from various freely accessible and credible sources online.

## INDEPENDENT VARIABLES

### *Women's Status*

#### *Gender Empowerment (GEM) and Gender Development (GDI)*

Broadly speaking women's status in this dissertation is defined as the extent to which women express rights codified in the larger international laws and enjoy those rights in the social, economic and political spheres (Richards and Gelleny 2007). Their status is operationalized using two indices as suggested by Crow and Lodha (2011), and recent studies by Smith and Haddad (2000). The GEM and GDI<sup>33</sup> measures are independent variables measuring women's status. The former includes aggregates of economic participation and decision-making citing the percentage of professional, management, technical and legislative positions held by women vis a vis men, as well as power over economic resources using estimated earned income (PPP US\$). The

---

<sup>33</sup>The Gender Empowerment (GEM) and the Gender related Development Index (GDI) measures came into being after the UN's decade for women (1975-1985).

latter measure combines women's life expectancy, education (the sum of primary to tertiary gross enrollment ratio) and estimated earned income. Women's education in LMICs holds sway due to its beneficial impact suggested in literature, and the gender stratification perspective which cites the institutional preparation of women as a precursor to better economic opportunities (Shandra et al. 2011).

By offering insight into gender inequality, human development, gendered decision-making, economic and political participation, these measures reveal different patterns of human development thereby providing advantage in any analysis using women's status. Also, since they are standard measures, they easily convert into policy cross nationally (Walby 2005). Theoretically, GEM values range from 0 (no empowerment) to 1.00 (full empowerment); in my data set GEM values range from low empowerment 0.129 (Yemen) to high empowerment 0.782 (Argentina).

Meanwhile, the relevance of the Gender related Development Index (GDI) cannot be overstated because it focuses on the lives of women especially their education and income. A Gender inequality value of 0 indicates that women and men are at par in aspects such as education, income and life expectancy. In the dataset, gender inequality values range from more gender equality, to more gender inequality 0.712 (Afghanistan). The table below juxtaposes GEM and GDI measures and details the different dimensions of each measure.

**Table 3: Composite Indicators Measuring Women’s Status in LMICs**

GENDER EMPOWERMENT MEASURE (GEM)		
<p><b>Economic participation and decision making</b></p> <p>% share of professional and technical positions(women’s % share of positions as legislators, Snr. officials and managers</p> <p>And</p> <p>Women’s % share of professional and tech positions).</p>	<p><b>Political participation</b></p> <p>Decision making ( women’s share of parliamentary seats</p>	<p><b>Power over economic resources</b></p> <p>The variation between women’s and men’s <b>estimated earned income</b> (PPP US\$)<sup>34</sup></p>
GENDER DEVELOPMENT INDEX (GDI)		
<p><b>Women’s life expectancy</b></p> <p>No. of years lived</p>	<p><b>Education</b></p> <p>Measured as the adult literacy rate and the combined primary to tertiary gross enrollment ratio</p>	<p><b>Estimated earned income</b></p> <p>Amount earned from any income in employment outside the home.</p>

*Vulnerable Employment*

In this study this variable is a proxy measure for women’s precarious “employment.” It supports the myriad scholarly views arising out of research on the

<sup>34</sup>PPP or purchasing power parity is used to standardize currency rates across countries.

*“feminization of poverty,”* and *“feminization of labor.”* Further, this variable captures the salience of women’s work and illuminates assumptions of the gender stratification perspective about patterns set in motion through policies such as SAPs in general and the state’s response in particular (McMichael 2012; Owusu-Afriye and Nketiah-Amponsah 2014; Aulette and Wittner 2015). According to the World Bank data this variable is computed as a percentage of the total employment in LMICs where women comprise a larger portion of unpaid and underpaid workers in wage employment (Kabeer 2003; WDI 2007). According to the International Labour Organization (ILO) estimates in 1998, women make up 90% of export processing jobs and assembly work (sweat shops) found in LMIC countries (McMichael 2012). Vulnerable employment is contraindicated by weak development, little job growth, and large rural economic conditions found in abundance in LMICs.

In this dissertation, I hypothesize that since opportunities for women to work outside the home are available mostly in low wage positions which may be unstable, it sometimes requires that women supplement household income. This they tend to do by joining even more vulnerable jobs (McMichael 2012). This data drawn from the World Bank is a labor force survey of households supplemented by official estimates. One of the reasons affirming its pertinence in this dissertation is that it is comparable across regions.



## *State Contexts*

### *Gini Coefficient*

This variable is operationalized as a measure for inequality within the LMIC region and then used to predict child undernutrition. Gini indicates national wealth on a matrix and it includes the income distribution of a nation's residents, growth rate, inequality, and well-being. In this way, it is unlike the GDP which is neither a measure of income nor well-being (Stiglitz, Sen, and Fitoussi 2009; Shandra et al. 2011). The coefficient ranges from 0 (all recipients have the same income: full equality) to 100 (all income is received by one recipient only: maximum inequality) (Milanovic 2005). The assumption held in this dissertation is similar to that in existing literature that the greater the coefficient the greater the prevalence of undernutrition (Smith and Haddad 2002). In my dataset, Gini values range from Mozambique (32.00), to Namibia and Lesotho (63.20). This variable is logged to adjust for its skewness.

### *Democracy*

It is a proxy measure for state commitment to children's well-being through support of sound institutional frameworks which develop safety nets for vulnerable groups including children. It is operationalized as individual rights safeguarded by the state to promote public participation. Democracies are expected to support free trade and local investment which boosts local incomes and safeguards children's welfare including nutrition. In addition, democracy supports gender parity, which means that states with less democracy have greater gender stratification. Based on the foregoing, apart from the expectation that there are fewer undernourished children in democracies,

there is also expectation of a strong positive relationship between democracy and women's autonomy. As such, women in more democratic states are expected to have a higher status. I use Freedom House's annually published index of democracy 2012 ranking countries by political rights (aggregating 10 questions), and civil liberties (aggregating 15 questions) taken from the Universal Declaration of Human Rights (Freedom House 2012; Shandra et al 2011). Values range from 1 (most free) to 7 (least free) (Freedom House 2012). Countries that score closer to seven have more strife and conflict and therefore less political will to create infrastructure and combat child undernutrition. They also have less civil tolerance for gender parity.

#### *Trade Links*

This variable measures LMICs integration into the existing world system and uses the measure of exports of goods and services from the World Bank dataset to assess the amount of integration into international markets and compliance with neo liberalism through foreign trade. The LMIC region is classified as either periphery or semi periphery, a position determined by the type of exports it trades. As suggested in literature LMICs rely on exports in response to adjustment requirements and as a result of their colonial legacies (Acemoglu, Johnson, and Robinson 2002; World Bank 2007). This measure is operationalized as a percentage of the Gross Domestic Product (GDP) which represents the value of all goods and other market services provided to core countries. It includes the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government service. I hypothesize that a

higher amount of exports will have a greater positive effect on child undernutrition. That is the more trade a country engages in, the greater the prevalence of child undernutrition. This is because the exchange of raw materials and finished goods is unequal, and consistently puts LMIC countries in situations where they need to seek even more markets for their goods, but with the expectation of minimal returns. In addition, higher volumes of exports indicate dependency (Frank 1979; Shandra et al. 2011). I log this variable to correct for skewness.

#### *External Debt*

External debt serves as an adequate measure of dependency in LMICs. This variable has been used in previous research on the impact of economic growth on children's health (Isbister 2001). According to the world systems perspective within which this dissertation is framed, debt is historically linked to the development trajectories of LMICs either immediately after colonization, or in the 1980s as structural adjustments occurred and Bretton Woods institutions sought to rescue many countries in financial distress. It is an interval ratio measure among the WDI on the World Bank database. The data are measured as a percentage of exports of goods and services. I hypothesize that indebtedness of LMICs predicts the prevalence of child undernutrition within the region.

External debt is that part of the total debt in a country that is owed to creditors outside the country. The debtors can be the government, corporations or private households. The debt includes money owed to private commercial banks, other governments, or international financial institutions. Total debt service is contrasted

with countries' ability to obtain foreign exchange through exports of goods and services. Thus, where exports are ongoing in high volume but returns are minimal then servicing debts becomes a perennial problem as is experienced currently. Debt ratios are used to assess the sustainability of a country's debt service obligations as we know LMICs are known to traditionally seek debt exemption because they lack resources to service existing debt (WDI 2005). This variable is logged to correct for skewness.

#### *Multinational Presence (MNC)*

This variable is operationalized as Foreign Direct Investments (FDI)<sup>35</sup> which enable a country to meet local obligations by generating internal revenue through foreign investment by MNCs. Using the world systems perspective and with the background of structural adjustments considered, an increase in foreign investment for LMICs is likely to lead to an increase child undernutrition (McMichael 2011). A good amount of recent research demonstrates that FDI diminishes child well-being on the whole (Monshipouri, Welch, and Kennedy 2003; Shandra, Nobles, London, and Williamson 2004). This variable is taken from the World Bank data set and is logged to correct for its skewed distribution.

#### *Region*

The variable (region) reflects the classification of countries listed in appendix A according to World Bank income estimates. It was used to create a dummy variable

---

<sup>35</sup>FDI is the net inflows of investment to acquire a lasting management interest (10% or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short term capital as shown in the balance of payments. Data are in current U.S dollars (WDI 2012).

indicating regional response to stunting, wasting and severe underweight. This variable provided support to the discussion on GDP as it indicates regional variance that is usually captured in micro studies. Upper Middle Income countries served as a reference category (coded =1), and Lower middle and Low Income countries were coded 0. Each year the World Bank revises the classification of the world's economies based on the estimates of gross national income (GNI) per capita for the previous year. Low income countries are those where citizens on average earn \$1,035 or less and Lower middle income countries have citizens on average earning \$1,036 to \$4,085.

#### *Contaminated Water Sources*

I include this variable in the models because previous research in LMICs accounting for children's health identifies contaminated water as a poor natural resource linked to a proliferation of perennial poor health. It is operationalized to measure propensity to morbidity due to helminthic infections. Access to contaminated water drinking water predisposes children to poor nutrition through illness and at the same time causes poor nutrition. A large amount of recent literature cites the occurrence of child undernutrition as a result of poor resources such as water in the region (UNICEF 2013; World Bank 2014). The contaminated water resources are found in wells, surface water, and vendor provided and bottled water (Shandra et al. 2011). This variable is drawn from the CIA data (2008). Contaminated water is used to predict child undernutrition because of its causal link to morbidity and mortality among children, causing 4% of global deaths and 10% of total disease burden (Zaracostas

2008; Groce, Bailey, Lang, Trani, and Kett 2011). This variable is also logged to correct for skewness.

## CONTROL VARIABLES

### *GDP per Capita*

This variable measures economic growth. Higher GDP per capita (GDP in current international \$) means positive economic growth which indicates development, while negative GDP per Capita means less economic growth. Research cites an inverse relationship between per capita national incomes and children's nutrition (Sen 1985; Smith and Haddad 2002; Nugent and Shandra 2009; Shandra et al 2011; Marsh 2014). States with higher Gross Domestic Product will have a lower prevalence of child undernutrition because wealth increases standards of living (Larrea and Kawachi 2005). Data are in current international dollars based on the 2011 ICP round (World Bank, International Comparison Program database). The measure is taken from the online World Bank source. Since this distribution is skewed it is logged.

### *Population Growth Rate*

This variable measures the percentage of growth of a population as an indicator of the "pressure" exerted on services, or demanded by citizenry. Literature states that population size; structure and distribution affect the health of societies. Population in nutrition literature is cited as having a relationship with food utilization and consumption patterns especially in countries undergoing a nutrition transition (Weeks 2012). To control for the influence of population growth on the dependent variable, this variable is logged to correct for its skewness.

### *Political Power*

This variable is operationalized as women's leadership measured by the percentage number of parliamentary seats occupied by women in the lower house of parliament in a country. Being a relatively new concept, it is found in complete form in the PARLINE database (IPU, [www.ipu.org](http://www.ipu.org)) which gives the latest summaries.

Literature explains that the greater the percentage number of seats held by women, the more shared leadership there is and the greater the influence women have. I assume that, women's political leadership predicts child undernutrition through the ability to influence policy affecting children's well-being. This variable is logged to correct for skewness.

### *Women's Mobility*

It is operationalized as a proxy for women's autonomy in decision making. In the WDI it is measuring women's own perception of reprimand for this autonomous decision. Thus, acceptance of reprimand implies women have no autonomy. This means low scores on this variable indicate higher women's status. Information on this variable is collected annually as a part of the Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS) trends, and has been logged to correct for skewness. Below find a summary list of variables indicating descriptions and sources.

**Table 4: List of Variables, Variable Names and Sources**

Variables	Index	Source
<b><i>Dependent Variable(s)</i></b> Child Undernutrition	i)Stunting (Height-for-age; HAZ) SH.STA.STNT.ZS  ii)Severe Wasting (Weight – for – height; WHZ) SH.SVR.WAST.ZS  iii)underweight (Weight-for- age; WAZ) SH.STA.MALN.ZS	World Bank, World Development Indicators(WDI)
<b><i>Independent Variables</i></b>		
Regional Inequality (logged)	Gini Index coefficient (2011) NY.GNP.PCAP.PP.KD	World Bank, World Development Indicators <a href="http://data.worldbank.org/indicator/">http://data.worldbank.org/indicator/</a>
Trade Links (logged)	Trade Export of goods and services ( % of GDP) NE.EXP.GNFS.ZS	World Bank, World Development Indicators(WDI)
Multinational presence (logged)	Foreign Direct Investments(FDI),net inflows as a % of GDP BX.KLT.DINV.WD.GD.ZS	World Bank, World Development Indicators(WDI)
Democracy	Commitment to citizens’ rights and civil liberties including children	Freedom House
External Debt (logged)	Dependency (% of GNI) DT.DOD.DECT.GN.ZS	CIA The World Fact book <a href="https://www.cia.gov/library/publications/download/download-2013/index.html">https://www.cia.gov/library/publications/download/download-2013/index.html</a>



---

Region (Dummy)	World bank classification < 1,035 – Low income \$1,036 - \$ 4, 085 – Middle Income	WDI
Contaminated water	Unimproved Water Sources	CIA The World Fact book <a href="https://www.cia.gov/library/publications/download/download-2013/index.html">https://www.cia.gov/library/publications/download/download-2013/index.html</a>
Gender Empowerment measure (GEM)	Economic participation Women and men’s % share of positions as legislators, senior officials, and managers -women and men’s % shares of technical and professional positions  Political participation -women’s share of seats in parliament  Power over Economic Resources - ratio of women’s and men’s estimated income	Human Development Indicators 2008/9
Gender Development (GI)	Women’s life expectancy, Education and estimated earned income	Human Development Indicators 2013
Vulnerable Employment (logged)	Vulnerable Employment SL.EMP.VULN.FE.ZS	World Bank, World Development Indicators(WDI)

---

---

<u>Control Variables</u>		
Economic Growth (logged)	GDP Per Capita by purchasing power parity 2000-2011 <i>NY.GDP.PCAP.KD.ZG</i>	World Bank, World Development Indicators(WDI)
Population Growth Rate (logged)	Population Growth Rate Annual % <i>SP.POP.GROW</i>	World Bank, World Development Indicators(WDI)
Women's leadership (logged)	% Total number of political seats occupied by women in national parliament-lower house	PARLINE IPU, www.ipu.org
Women's Autonomy (logged)	Mobility <i>SG.VAW.GOES.ZS</i>	World Bank, World Development Indicators(WDI)

---

## DATA ANALYSIS

A cross sectional data set is used for this dissertation and the SPSS (Statistical Package for Social Science (19.0) software is utilized for analysis. Descriptive and inferential statistics were used in the data analysis. In order to obtain the descriptive statistics, frequency distribution reports provided the information on all the variables in the analysis using measures of central tendency (means) and measures of variation and dispersion (standard deviation). Descriptive statistics for example describe the dependent variable as it relates to the other measures in the category. This is because the dependent variable consists of one sample population (undernourished children < 5years) with three variables (stunting- HAZ, severe wasting -WHZ, and underweight-WAZ). To facilitate robust analysis, I transformed the percentage scores in the WDI

dataset into z-scores so that I could compare each perceived score to other values within the distribution. Skewness was calculated and where it was observed, the variable was logged to correct for this.

The independent variables have been purposely organized from various sources, the women's status variables are dimensions of women's status using two indices GEM and GDI as measures of the social, economic and political aspects. The contextual variables on the other hand are based on their uniform availability (homogeneity) in the LMIC region. Despite the variation in the sample size in some of the models, I interpreted a confidence level of  $p < .05$  as the lowest threshold to reject the null hypotheses. However, I reported the statistics across the commonly used confidence levels.

In order to optimally use the variables in my selection, and to ensure that they were suited for analysis, I subjected them to a verification test by checking for effect size using partial Eta squared ( $\eta^2$ ) in SPSS. This indicated the amount of variability in the dependent variable explained by a group of independent variables (Levine and Hullet 2002; Trusty, Thompson, and Petrocelli 2004). This technique permits a descriptive understanding of how the variables in the sample are behaving because the magnitude of the relationships of difference indicate the significant results beyond observation of the p value alone for significance.

Knowledge of the effect size allows for a more accurate assessment of the relative importance of independent variables in a group in predicting stunting, wasting and severe underweight. The recommended minimum effect size is .41 for group

difference, and this was used as a criteria to deselect the 4 variables that I have explained below on the basis of the size of overlap, and in order to avoid an error. On the Eta scale, 1.15 indicates moderate effect while 2.70 indicates a strong effect. Table 10 in the appendix B showing the partial Eta for all predictors used, indicates the results displaying the eligibility criteria. The difference between groups is of practical importance. Further, in clustering variables into the predictor categories namely women's status and state contexts, the process of selecting the variables was sensitive to overlap, which has been known to confound the levels of significance. I thus proceeded to exclude the four variables from the regression as a result of the results of the partial Eta<sup>2</sup>, and in the final analysis still managed to elicit a reasonable number of independent variables to cluster under the two themes of women's status and country contexts.

#### *Variables Excluded in the Regression Models*

Some salient variables suggested in literature on similar topics and focused on LMICs were omitted in the regression models specifically because they would influence the equations and possibly confound outcomes. After confirming the suitability of the variables selected for this study, the following were omitted.

- i. *Commodity concentration* which refers to the value of a state's most important export commodity as a percentage of its total exports. This variable is already well represented in this study by exports as a percent of GDP which also indicates amount of integration.

- ii. *Female educational attainment* as an alternative indicator of educational attainment and is used to assess women's status in contemporary studies. Already this study uses the Gender Development Index which uses female education as one of its dimensions.
- iii. *Structural Adjustment* loans would have facilitated an analysis of the social infrastructure by investigating the effect of these loans which are known to have had an adverse impact on children's well-being. However not all LMICs took these loans, and some countries defaulted but were still given more loans causing confusion of repayment expectations.
- iv. *Investment as a percent of GDP* would have served as a control variable to moderate the effects of foreign investment. However the use of GDP as a measure of economic growth is sufficient. This measure drew the highest score on the Eta<sup>2</sup> scale suggesting the possibility of an overlap if used.

By excluding these variables from the study, the independence of variables was maximized to reflect the true effects during the regression analysis. The presentation of a bivariate (zero-order) correlation matrix of all the variables in the analyses showing Pearson's correlations coefficients illustrates the bivariate relationships and indicates the strength and direction of these relationships. In addition, these correlations can point to cases of multicollinearity. Prior to testing each hypothesis, non-normality testing revealed normal distributions for the dependent variable, but some skewness for nine of the fourteen independent variables. To correct for this and ensure normal distribution across all variables, I proceeded to log<sub>10</sub> transform these skewed variables,

after investigating the histograms. After correction, I achieved relatively normal distributions. Although my analysis is restricted to a total of 139 countries, there are variations in the Ns of the OLS models due to missing data or clustering which disqualified some cases. The Ns presented therefore vary from 121, 132, and 135 to 139. The lowest N (121) is found in the model with economic variables only (see Table 8). This number of Ns is low due to missing values that have occurred from the missing cases which multiple imputation could not correct. In this table the variable that is particularly vulnerable to this problem of missing cases is the measure for economic growth (GDPppp). In some of the smaller island countries in the sample this has not been measured in the last three decades. Similarly in areas of high conflict or where war is pervasive. Findings of this research must therefore be interpreted with this limitation in mind. However various scholars have suggested a consideration of specific ratios by researcher to assist in determining an appropriate number of cases to include in multivariate models so as not to compromise interpretations. This study remains within acceptable limits suggested as it has no less than 10 cases to every one predictor (Shandra et al. 2004). This case of missing data among LMICs for several time periods limits observations in samples and reduces the possibility of generalizing the findings.

I estimate the effect of predictor variables on the dependent variable which has measures for the three dimensions specifically stunting (HAZ), severe wasting (WHZ) and underweight (WAZ) using Ordinary Least Squares Regression (OLS). In order to ascertain which factors predict child undernutrition (stunting, wasting and severe

underweight), and which are more important ones, this generalized linear modeling technique is the most suitable. This is because it models a single response variable that is a proportion (%) and can be applied to multiple explanatory variables (Hutcheson 2011; Tabachnick and Fidell 2013). The suitability of the OLS technique is further advanced by its current use among a number of researchers in studies on women's status and or country contexts especially LMICs (Smith and Haddad 2000; Shandra et al. 2004). In addition, OLS is suitable for use with independent variables that may be correlated with one another and with the dependent variable to varying degrees without prejudice to numeric outcomes (Klienbuam, Kupper, Nizam, and Rosenberg 2014).

When using OLS several assumptions should be met to ensure reliability and validity of the results. Since I am interested in investigating the relationship between child undernutrition which is my dependent variable, and several independent variables, categorized by women's status and state contexts, I first used the bivariate analysis to determine the strengths of the coefficients as a preliminary step to assessing how well the independent variables predict the dependent variable(s), and to observe cases of multicollinearity. I then constructed models in which each model tested the independent predictors on the three dependent variables. In each table there are two models, the first has no controls present, and the second one which is considered the saturated model has controls added to it. This is the best way to present the effects of attrition which tend to occur in the second model if any. In all, I constructed three regression tables each with a total of six equations.

The first table presents women's status predictors only (Table 7). The second table has the contextual predictors only (Table 8) and the third table is a combination of all the predictors in the study (Table 9). Each of these models is discussed comprehensively at the appropriate stage in the research findings chapter. The difference between these three tables is that, the predictors in Table 7 include only those modelling women's status on child undernutrition. The Table 8 subsequently includes only those predictors relating to the homogeneous context of LMICs, while the final Table 9 presents all the predictors in the study. Generally, my results indicate that the data meets the normality, linearity, multicollinearity and independence assumptions. The Beta estimate specifies which of the independent variables has the largest impact on the dependent variable, while the change in  $R^2$  indicate the relative contribution of each variable to the variance explained in the dependent variable (Kleinbaum et al. 2014).



## CHAPTER IV

### RESEARCH FINDINGS

#### INTRODUCTION

The main aim of this dissertation is to address two overarching questions specifically, to what extent is the improved status of women engendering pathways to diminish the prevalence of child undernutrition in LMICs, and why is child undernutrition prevalent in LMICs? This chapter presents findings of the data analysis. The first section presents the regression diagnostics, followed by a discussion of the results of the univariate analysis to highlight the patterns and distributions of each individual variable in the dataset. This is followed by a discussion of the bivariate and multivariate analyses. A structured discussion of each hypothesis is incorporated into this report of the findings.

#### REGRESSION DIAGNOSTICS

An advantage of using regression analysis as an analytical technique cited in literature is that it accounts for all the inter-correlations among the independent variables with regard to inference making and estimation, while at the same time treating each independent variable separately in relation to the dependent variable (Kleinbaum et al. 2014). Initial preparation preceding analysis included inspecting the distributions of the independent and the dependent variables, for consistency with basic assumptions of regression analysis. Prior to testing each hypothesis, I checked for independence, linearity, homoscedasticity, non-normality and multicollinearity.

Making use of the various regression diagnostics to maintain reliability of results, I did the following. First, I ensured that the observations are independent and randomly sampled at the interval level. The multivariate normality is especially important in the dependent variable HAZ, WHZ, WAZ, thus checking for this within these groups is essential. The importance of normality is that the residuals of the dependent variable should be normally distributed. Should this not turn out to be the case, and the assumption is violated, the distribution is skewed. To detect this abnormality I examined the p-p plot and values of skewness and kurtosis for all variables in the analysis. For all the dependent variables they were diagonal with minor deviations from normality, which were corrected once the dependent variable was transformed into z-scores. Values for the dependent variable child undernutrition (HAZ, WAZ, and WHZ) were within the acceptable range of (+/-3). In addition, I used histograms to determine the magnitude of skewness to the left or right to decide the specific technique to use to correct for this. In the dependent variable(s) the skewness was slight and corrected for when I transformed the measures into z-scores which also enabled comparison of the means. The kurtosis for all the values of the dependent and independent predictors was also examined and finding some skewness in the independent predictors, I addressed these during the  $\log_{10}$  transformations as a look at the histograms showed a skewing to the left across 9 of the 15 variables it then became necessary to attempt to correct this. These nine were transformed using  $\log_{10}$

transformation<sup>36</sup> which is most suited according to literature (Sweet and Grace – Martin 2012; Tabachnick and Fidell 2013).

The decision not to transform the variable *Poor Natural Resources* was arrived at when it met the normality assumption on the histogram. The remaining variables *Democracy*, *Gender Development* and *Gender Empowerment* are all indexes whose distribution was already normal after checking for effects of non-uniformity also using histograms. There were a few outliers presenting on the scatterplots of the 9 variables, before the transformation using  $\log_{10}$  but once the variables were checked again after the transformation, these outliers did not appear on the scatterplots. Generally, the data appeared homoscedastic and did not violate this assumption either (Klienbuam et al. 2014).

A univariate outlier occurs when a case with an extreme value in one variable occurs, none of the standardized z-scores was higher than 3.29 ( $p < .001$ , two-tailed test). However, with any multivariate outlier, there would be a strange combination of scores on two or more variables visible on the plots (Tabachnick and Fidell 2007). Both these types of outliers are known to distort statistics. Making sure also that the variances in each group are roughly equal I used the Mahalanobis distance to determine if multivariate outliers will influence normality. I identified multivariate outliers for each of the regression models, but did not elect to exclude the extreme cases.

---

<sup>36</sup>With the exception of the dependent variable and variables using indexes and scales, all other variables have been transformed using  $\text{Log}_{10}$  transformation to normalize the skewed data, meet the assumptions of inferential statistics and make patterns interpretable. Transformation is required for inference making when the normality assumption is not held (Tabachnick and Fidell 2013).

The data were then inspected for multicollinearity<sup>37</sup> using a correlation matrix for each of the predictors. This did not present a problem because all independent variables appeared not to be correlated as indicated by the coefficients, except in one case. The coefficients ranged from (-.012) for poor natural resources and dependency to (.846) the highest coefficient for underweight (WAZ) and stunting (HAZ). The explanation given for the high coefficient which is not surprising, is that underweight (WAZ) is a composite measure of severe wasting (WHZ) and stunting (HAZ), and in some cases because of this it has been used as a sole indicator since it synthesizes the two measures (Smith and Haddad 2002). This explains the tendency towards multicollinearity. Moreover, it has also been stated that the correlation matrix may obscure some incidences of multicollinearity, thus, I regressed each independent variable on all other independent variables and found the  $R^2$  from these equations did not exceed the  $R^2$  in the Tables 7, 8 and 9 reported. Following the steps outlined by Klieinbaum et al. (2014), the Variance Inflation Factor (VIF)<sup>38</sup> was also used to look for the presence of multicollinearity. Low VIFs indicate an absence of multicollinearity which was the case in all the analyses. The VIF was considered with parameters as follows,  $VIF = 1$  (not correlated),  $-1 < VIF < 5$  (moderately correlated),  $VIF > 5$  to 10 (Highly correlated) (Klieinbaum et al. 2014).

---

<sup>37</sup>Multicollinearity exists when two or more predictors are strongly correlated in a regression model. If correlations are above .80, they are considered high (Klieinbaum et al. 2014).

<sup>38</sup> VIFs were examined for each predictor in the model to provide an indication of the degree to which the estimated standard errors of regression parameter estimates are affected by linear associations. Values greater than 10 indicate collinearity among the predictors and should be corrected (Klieinbaum et al. (2014). In this specific case this did not arise.

. The analysis indicated a VIF range of 1.08 to 2.03. A VIF of greater than 10 indicates collinearity issues that need corrective action (Nachmias and Guerrero 2006; Kleinbaum et al. 2014). In this study the highest VIF estimated is 2.065, which rules out possibilities of multicollinearity since this is less than the suggested estimate. Thus the coefficients were moderately correlated and indicated the absence of multicollinearity. Using the F test<sup>39</sup>, I find parsimony in the best fitting model which explains the largest amount of variance. This data screening ultimately indicated that my data meet the assumptions of OLS regression.

## DESCRIPTIVE ANALYSIS

Table 5 shows the means, medians, and standard deviations of all the variables used in the analysis. In this analysis, the dependent variable child undernutrition is made up of three dimensions and therefore three measures calculated as z-scores, namely stunting, severe wasting and underweight. As such, each measure of the dependent variable is discussed independently during this univariate analysis and the subsequent bivariate and multivariate analysis. Since a number of variables are log transformed, the means and standard deviations of the pre- and post-transformed variables are presented in the same table side by side. To enable a comprehensive interpretation of the descriptive information, only the percentages, means and standard deviations of the pre-transformed variables are discussed here.

---

<sup>39</sup> A larger F- statistic means that there is more between-group variance than within- group variance, increasing the chances of rejecting our null hypothesis.

The table indicates that in 2013 on average 23 percent (SD = 15.00) of the children under five years of age in LMICs were stunted, which is 11 percentage points more than the ones who suffered underweight (12 percent, SD= 11). Only a few children under 5 years were severely wasted 2 percent (SD = 1.94), the reason being that wasting is more a measure of chronic undernutrition from recent food deprivation or illness. A famine is likely to cause wasting however these are rare even in the LMIC region. These percentages are indicative of and underscore the ongoing concern over the outcomes of chronic undernutrition, especially stunting. There has been a recent focus on stunting from the evidence of topical scholarly work by a number of researchers and relevant organizations such as UNICEF reiterating the dangers of stunting (Smith and Haddad 2000; Underwood 2002; Monteiro et al. 2010; Vollmer et al. 2014).

It appears that women's status in LMICs based on the rating of the gender empowerment scale (which defines 0 for no empowerment and 1.00 for full empowerment), is fair at a paltry .2 (SD = .40) on the scale which can be interpreted as weak. The level of gender development is slightly better, on the index measuring inequality between the genders on women's life expectancy, education and estimated income (where 0 is total equality and 1.00 is perfect gender inequality), the mean is .28 (SD = .45). However of note is that this figure includes current demographic realities in LMICs where women's longevity is markedly better than men's rather than because of increases in the other measures of the index, namely income and education.

Interestingly, women's leadership seems not to reflect the closing gender gap or the achievements of gender development because among women as a group in LMICs only 20 percent (SD = 12.3) occupy national leadership positions. Having said this, 25 percent (SD = .32) responded that it is appropriate for women to be "disciplined" by their spouses if they were mobile without first seeking permission. This indicates a subjective view of autonomy which goes against the philosophy of empowerment that values freedom. Rounding off the discussion on women's status is women's employment. On average, of the women in LMICs engaged in wage earning, approximately 41 percent (SD= .33) are in vulnerable employment also defined as precarious work which is usually underpaid.

Specific contextual features of LMICs emerge from the data. On average poor resources abound, here evidenced by the prevalence of contaminated water sources available for human consumption (22 percent, SD = .17) which is driving helminthic infections and fostering competition. LMICs on average have a population growth rate that is high when compared to other global regions as indicated by the World Bank (2014), with a growth rate of 5.4 percent (SD = 2.08). This contrasts with the low GDP (ppp) growth rate on average of 3 percent (SD= 2.5) indicated for the region. There are some specific countries in the region producing a medium democracy score for commitment to the rights of vulnerable groups including children. The average score is 4 on the Freedom House's annually published index of democracy with values ranging from 1 (most free) to 7 (least free) (Freedom House 2012). This can be interpreted as the existence of partial freedom. A few more contextual variables complete the picture

in this study, mainly concerning the Gini index of inequality and trade, MNC penetration and external debt which reflect the state of dependency as stated by the world systems perspective. The Gini measures inequalities in the region, finding an index score on average of 35.72 in LMICs where a glance at individual country values can clarify the meaning further. The range is from low inequality in Belarus (26.00- see index description in Chapter 3) to considerably high inequality found in South Africa, Seychelles, Namibia, Lesotho, Honduras, Columbia, Brazil and Benin with Gini index scores ranging from 50.00 to 65.02. Dependency on multinationals (MNC penetration) for foreign direct investment, indicates dependency which on average among LMICs is at 4.6 percent (SD = 6.1) of the GDP (ppp US\$). The lowest FDI scores designated in this study for specific countries are in Angola (-5.73), Hungary (-3.22) and Yemen (-0.3) whose negative score indicate a low reliance on FDI. In contrast, countries like Congo Republic, Djibouti, Liberia, Mauritania, Mozambique, St. Vincent and Grenada, have scores greater than the mean of up to 10 percent demonstrating a high reliance on FDI. This difference among the states, that is those dependent and those moving away from dependency in the region is what accounts for the large standard deviation (SD 6.05). In addition, seeking to increase trade with foreign entities also indicates dependency. Results show a mean of 34.75 percent (SD = 20.68) which constitutes more than a quarter of the GDP (ppp US\$) rate of the region. Table 5 lists the descriptives of each variable.



**Table 5: Descriptive Statistics of All Variables Used in the Analysis, 2013**

Variable	N	Mean	SD
Child undernutrition (Stunting %)	139	23.50	15.00
Child undernutrition (Severe Wasting %)	139	1.82	1.94
Child undernutrition (underweight %)	139	12.31	11.00
GEM (index)	135	.19	.40
GII (index)	139	.28	.45
Women's vulnerable employment	139	.41	.33
Women's vulnerable employment (logged)	139	1.30	.73
Women's political power	139	19.58	12.38
Women's political power(logged)	139	1.18	.37
Gini Index	139	34.72	17.26
Democracy (7- point scale)	139	3.84	2.1
External Debt	138	39.27	36.27
External Debt (logged)	138	1.34	.63
Exports GDP	139	34.75	20.68
Exports (logged)	139	1.44	.40
FDI	137	4.58	6.05
FDI(logged)	137	.60	.34
Contaminated water sources	139	.22	.165
Contaminated water sources (logged)	139	.99	.52
Women's mobility	139	13.19	18.90
Women's mobility (logged)	139	.65	.71
GDP per capita growth rate	125	2.97	2.5
GDP per capita growth rate (logged)	125	.51	.29
Population growth rate	138	5.4	2.08
Population growth(logged)	138	.37	.21

Source: World Bank World Development Indicators (2013), Human Development Report (2008), (2013), CIA World Fact book (2013), Inter Parliamentary Union (2013), and Freedom House (2013). Note: Scores have been rounded off to the nearest two decimal places. Variables in the table show results of log10 transformation to correct for skewness.

## BIVARIATE ANALYSIS AND MULTIVARIATE ANALYSIS

The bivariate analysis in Table 6 below presents Pearson's correlations coefficients among all the variables that have been used in this research. The first three columns illustrate the bivariate relationships among the three dimensions of the dependent variable (HAZ, WAZ and WHZ) and all the independent variables.

Generally, there is a strong statistically significant correlation among stunting, severe wasting, and underweight indicative of an ensuing dynamic co-existence, and signifying a co-dependence among the dimensions. In other words if a child is underweight, they are also likely to be severely wasted, affecting chances for optimal growth which leads to stunting. Though this is not always the case, the link is a likely scenario in an environment where all three dimensions are present.

There is a very strong statistically significant positive correlation between underweight and stunting ( $r = .846, p < .01$ ), also between severe wasting and stunting ( $r = .588, p < .01$ ) and severe wasting and underweight ( $r = .705, p < .01$ ). As underweight increases so does stunting and as severe wasting increases so does stunting and underweight.

On the whole, the bivariate correlations generally aligned with the assumptions in the hypotheses showing significance in the relationships. However there were surprising exceptions for instance in the assumed association between women's vulnerable employment and child undernutrition, showing no association. In addition there was also no association among foreign links and stunting, wasting and severe underweight; as well as a lack of significance in the association between foreign debt

and child undernutrition. Similar findings are reiterated in current research (Smith and Haddad 2000).

The three tables predicting child undernutrition are consistent with the overarching themes<sup>40</sup> and theoretical categories<sup>41</sup> of this dissertation. In the first regression Table 7 the variables relate to women's status. Subsequently in the regression Table 8 and 9 the variables are specific to contexts and in the final table, there is a combination. The different tables indicate subtly that the addition of controls in some of the cases results in attrition of the significance from one model to the next.

A further point to note is the different number of N's arising from varying sample sizes across the models. While this caused no overt prejudice to the results in the models, there are shortcomings indicated by other research which has undergone similar methodological challenges. To overcome this, I report the adjusted  $R^2$  which corrects for any anomalies, and indicates the model of best fit. This shift in Ns mainly occurs in Table 9 which includes all the variables in the study. The higher value of constants in the regression models of Tables 7, 8, and 9 suggest a higher incidence of stunting when compared to severe wasting and underweight. This suggests that among LMICs stunting is a major problem.

### *Research Question 1*

The first research question asked about the extent to which the improved status of women engenders pathways to diminish the prevalence of child undernutrition in

---

<sup>40</sup>Throughout the dissertation I have used the social, political and economic status of women as one trajectory of thought, and the state's economic landscape as another.

<sup>41</sup>This refers to gender stratification and Wallerstein's world systems perspective.

LMICs The findings of the first three hypotheses in respect to this question are reported as follows;

*Hypothesis 1:* Among LMICs there is a significant inverse relationship between women's empowerment and the prevalence of child undernutrition controlling for all other variables.

The correlation matrix (Table 6) reveals that all the associations between GEM<sup>42</sup> and stunting ( $r = -.240, p < .01$ ), underweight ( $r = -.250, p < .01$ ) and severe wasting ( $r = -.307, p < .01$ ) are moderate and negative albeit statistically significant. The results of the regression analysis are reported in Table 7. I find women's empowerment having an inverse effect on stunting ( $b = -.345, p < .05$ ) similarly on underweight ( $b = -.369, p < .05$ ), and severe wasting ( $b = -.607$ ) at the .05 level. These effects are significant. This suggests that when controlling for all other variables in the model, as women's status increases with greater decision making professionally and economically through increased earned income, severe wasting among children decreases by 60 percent. That is, for every standard deviation increase in empowerment, the number of severely wasted children decreases by .240. Similarly, stunting decreases by 34 percent and wasting by 36 percent. Both the bivariate and multivariate findings support Hypothesis 1.

---

<sup>42</sup>Gender Empowerment Measure (GEM) combines women's economic participation, decision making, political participation and power over resources relative to men

*Hypothesis 2:* Controlling for women's mobility and women's political power, women's vulnerable employment is significantly positively associated with child undernutrition.

The bivariate analysis reported in Table 6 indicates a weak positive relationship between vulnerable employment and stunting ( $r = .133$ ,  $p < .119$ ), a weak negative relationship with severe wasting ( $r = -.062$ ,  $p < .001$ ), and a weak positive relationship with underweight ( $r = .001$ ,  $p < .991$ ). The only relationship that is significant was with severe wasting. Having hypothesized that women's employment vulnerability is heightened by engagement in work that is low-paying or precarious, an increase in this type of work should therefore denote a decrease in child undernutrition across the three categories. Hence, the bivariate analysis suggests that vulnerable employment in fact has a weak negative relationship with severe wasting, in that an increase in vulnerable employment is associated with a slight reduction in wasting.

The multivariate analysis contradicts the bivariate findings by transforming all the associations into inverse relationships. Model 2, found in Table 7, indicates inverse effects for women's vulnerable employment on stunting ( $b = -.018$ ,  $p < .854$ ), severe wasting ( $b = -.170$ ,  $p < .133$ ) and underweight ( $b = -.119$ ,  $p < .132$ ). Thus, for each unit increase in vulnerable employment, the amount of stunting decreases by 1.8 percent, for severe wasting by 1.7 percent and underweight by 1.2 percent. However, none of these are statistically significant. Similarly for instance, for every standard deviation increase in women's engagement in vulnerable employment, the number of stunted children decreases ( $\beta = .013$ ) as does the number for severely wasted and underweight

children ( $\beta = .126$ ;  $\beta = .114$ ). Although this seems absurd, because among LMICs, vulnerable employment is associated with a poor quality of life, remuneration and health of children, in the literature there are explanations that for women in LMICs employment of any kind is more convenient than no employment since the income meets household needs (Quisumbing 2003). When controlling for women's autonomy and women's political power, there is no evidence of statistical significance across the three dimensions of child undernutrition.

An analysis of Hypothesis 2 concludes that women's vulnerable employment fails to predict child undernutrition among children in LMICs. Hence, the hypothesis is rejected.

*Hypothesis 3:* Among LMICs there is a statistically significant positive association between gender development and the prevalence of child undernutrition controlling for all other variables in the model. I assumed a detrimental effect on child undernutrition from increased gender development indicated by gender inequality. I hypothesized that gender development measuring disparities in education life expectancy, and estimated income are associated with child undernutrition. Therefore, the greater the disparity, the greater the prevalence of child undernutrition. Although the bivariate analysis presents mixed results that can be described as ranging from weak with regards to severe wasting ( $r = .221$ ,  $p < .01$ ), moderate in relation to underweight ( $r = .369$ ,  $p < .01$ ) and strong in reference only to stunting ( $r = .475$ ,  $p < .01$ ), the statistically significant and positive nature of these associations supports the expected logical association. Thus, the bivariate analyses support the hypothesis that as

disparities in women's life expectancy, education and estimated earned income increase, so do stunting, wasting and underweight among children.

The multivariate analysis on the other hand shows results similar to those in the bivariate model (Table 7). The saturated model which contains controls indicates statistically significant results for stunting only ( $b = .739, p < .001$ ), with partial support for the hypotheses by severe wasting ( $b = .266, p < .01$ ) and underweight ( $b = .538, p < .240$ ). The statistical significance in stunting leads to the support of the hypothesis, in which case it can be said that gender development predicts stunting when controlling for all other variables in the model. This finding is consistent with existing literature especially aligned to globalization trends and the two theoretical perspectives framing this study namely world systems and gender stratification. In this hypothesis the bivariate analysis shows support for the hypotheses, together with the multivariate analysis. Overall there was support for Hypothesis 3.

**Table 6: Bivariate Correlation Matrix for Child Undernutrition in LMICs**

Variables	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)
(i) Undernutrition Stunting(HAZ)	1.00								
(ii) Undernutrition Underweight (WAZ)	.846**	1.00							
(iii) Undernutrition Severe wasting(WHZ)	.588**	.705**	1.00						
(iv) Inequality	.236**	.038	.090	1.00					
(v) Exports (logged)	-.069	-.148	-.040	.339**	1.00				
(vi) MNC (logged)	-.219*	-.213*	-.137	.149	.413**	1.00			
(vii) Democracy	.310**	.262**	.265**	.028	.182*	-.130	1.00		
(viii) External debt (logged)	-.020	-.115	-.142	.288**	.533**	.357**	-.023	1.00	
(ix) Use of contaminated water	.637**	.571**	.373**	.158	-.012	-.078	.409**	-.163	1.00



Variables	(x)	(xi)	(xii)	(xiii)	(xiv)	(xv)	(xvi)	(xvii)	(xviii)
(x)GEM	-	-	-.307**	.165	.108	-.036	-	.072	-.307**
	.240**	.250**					.237**		
(xi)GDI	.475**	.369**	.221**	.227**	.060	-.021	.138	.092	.459**
(xii)Women's vulnerable employment	.133	.001	-.062***	.198*	.264**	.160	-.100	.319**	.040
(xiii)GDP growth (logged)	-.015	.028	.013	.249**	.307**	.240**	.046	.201*	.175
(xiv)Women's political power(logged)	.150**	.051	-.039	.212*	.135	.103	.064	.210*	.153
(xv) Women's autonomy (logged)	.513	.428**	.267**	.172*	.044	.111	.236**	.110	.443**
(xvi) Population growth (logged)	.675**	.579**	.405**	.240**	.070	-.046	.341**	-.081	.641**
(x) GEM	1.00								
(xi) GDI	-.187	1.00							
(xii) Women's vulnerable employment (logged)	.014	.129	1.00						

(xiii) GDP growth (logged)	.022**	.025	.082	1.00			
(xiv) Women's political power(logged)	.229**	-.027	.138	.191*	1.00		
(xv) Women's autonomy (logged)	-.198*	.345**	.250**	.172	.190*	1.00	
(xvi) Population Growth (logged)	-.193*	.425**	.100	-.025	.076	.441**	1.00

Note: \*  $p \leq 0.05$  \*\*  $p \leq 0.01$  \*\*\*  $p \leq .001$  (two-tailed test)

**Table 7: Estimates of OLS Regression Models For Women's Status Predicting Stunting, Severe Wasting and Underweight among Under 5s in LMICs, 2013.**

Predictor	Model 1			Model 2		
	HAZ	WHZ	WAZ	HAZ	WHZ	WAZ
Constant	<i>-.201*</i> (.100)	<i>.028</i> (.108)	<i>-.117</i> (.105)	<i>.843***</i> (.250)	<i>.068</i> (.292)	<i>-.332</i> (.273)
Gender Inequality	<i>.445</i> <i>.988***</i> (.170) [1.036]	<i>.170</i> <i>.376**</i> (.184) [1.036]	<i>-.334</i> <i>.741***</i> (.179) [1.036]	<i>.333</i> <i>.739***</i> (.165) [1.164]	<i>.120</i> <i>.266*</i> (.193) [1.164]	<i>.242</i> <i>.538*</i> (.180) [1.164]
Women's empowerment	<i>-.157</i> <i>-.396*</i> (.194) [1.036]	<i>-.275</i> <i>-.695***</i> (.210) [1.036]	<i>-.187</i> <i>-.473*</i> (.204) [1.036]	<i>-.137</i> <i>-.345*</i> (.186) [1.143]	<i>-.240</i> <i>-.607*</i> (.217) [1.143]	<i>.146</i> <i>-.369*</i> (.203) [1.143]
Women's Vulnerable employment				<i>-.013</i> <i>-.018</i> (.096) [1.082]	<i>-.126</i> <i>-.170</i> (.112) [1.082]	<i>-.118</i> <i>-.119</i> (.218) [1.082]
<b>Controls</b>						
Women's autonomy (logged)				<i>.350</i> <i>.496***</i> (.111) [1.296]	<i>.211</i> <i>.298*</i> (.130) [1.292]	<i>.336</i> <i>.477</i> (.121) [1.292]
Women's Political Power (logged)				<i>.125</i> <i>.341</i> (.200) [1.137]	<i>-.003</i> <i>-.008</i> (.233) [1.137]	<i>.044</i> <i>.119</i> (.218) [1.137]
Adjusted R2	.238	.109	.158	.364	.132	.244
F	21.881***	9.159***	13.535***	16.4***	5.078***	9.64***
N	135	135	135	135	135	135

Note: Unstandardized coefficients are italicized. Standard errors are in parenthesis. VIFs are in brackets. Remaining figures are the standardized coefficients. \*p ≤ .05  
 \*\* p ≤ .01 \*\*\* p ≤ .001(1-tailed test)

### *Research Question 2*

The second research question asks why child undernutrition is prevalent in LMICs. In responding to this question, reference to contexts within LMICs is made. The background assumption is that there are ongoing macro and meso level interactions expected to motivate structural modifications and diminish child undernutrition. However, since this is not the case, a closer investigation of the structures and contexts will adequately illuminate the ensuing complexities. I present the findings of the bivariate analysis in Table 6 for each of the hypotheses aligned to this question, and the regression models in Table 8, predicting the effect of state contexts on child undernutrition, as well as in table 9 modeling all the variables used in this study.

*Hypothesis 4:* Regional inequality in LMICs has a statistically significant relationship with the prevalence of child undernutrition controlling for all other variables. According to recent literature, inequalities in the LMICs occur as a result of scarce resources and the poor allocation of existing ones coupled with extraction, discrimination, income disparities and hierarchy (Crow and Lodha 2011). Table 6 suggests a weak but statistically significant correlation between inequality and stunting ( $r = .236, p < .01$ ), indicating that as inequality increases so does stunting. This is consistent with existing literature emerging from the region and is reiterated by UNICEF in reports published since the MDG period began. Statistical significance is

however absent in the relationship between inequality and severe wasting ( $r = .090$ ,  $p < .292$ ) and underweight ( $r = .038$ ,  $p < .100$ ). The regression analyses in Table 8 below present a slightly different picture.

In direct reference to Hypothesis 4, in which I assumed a statistically significant relationship between inequality and child undernutrition, Model 1 (without controls), there is a weak statistically significant positive effect between inequality and stunting ( $b = .271$ ,  $p < .05$ ), implying that for each increase in inequality, stunting also increases by 27 percent. This finding is supported in extant literature as shown in Chapter 2 (Smith and Haddad 2002; UNICEF 2013). However, when controlling for all other variables, while stunting still shows statistical significance albeit weak ( $b = .186$ ,  $p < .05$ ) wasting and underweight lack statistical significance ( $b = .062$ ,  $p < .230$ ;  $b = .011$ ,  $p < .212$ ), but show partial support for the Hypothesis 4 because the relationship is positive. These results generally indicate support for Hypothesis 4, that regional inequality has a statistically significant association with child undernutrition. The more inequality there is, the greater the prevalence. This calls for attention to regional inequality as a risk factor for child undernutrition.

To reinforce this discussion further is the variable World Bank region included in this table, where regional comparison is attempted to see if there is a difference within the regions themselves with respect to the variables of interest. The categories are determined by cut off amounts of income by the World Bank. Therefore controlling for other variables in the model. Middle income countries seem to have .090 more

stunting than upper middle income countries, likewise .114 more severe wasting and .111 more underweight respectively as indicated in Table 8. All the observations are statistically significant, in other words, for each unit increase in the standard deviation of stunting, wasting and underweight, there is an increase in stunting of .464, in severe wasting of .280, and .256 for underweight respectively. This is when comparing regions to the Upper middle income countries where there is greater earning, when controlling for all variables in the model. This pattern among regions is replicated by the observations in Table 9 of the saturated model.

Turning to the low income countries, it seems as if there is statistical significance across all the dimensions of the dependent variable, notwithstanding the fact that when compared to upper middle income countries in the region, there is more stunting ( $b = .354, p < .01$ ), severe wasting ( $b = .224, p < .05$ ) and underweight respectively ( $b = .896, p < .05$ ). A detailed discussion on the regional differences has been undertaken by Smith and Haddad (2000) who argued for the very poor state of child undernutrition in the sub-Saharan region and South Asia. They used the term “Asian Enigma” to describe the emerging undernutrition paradox related to the dire situation of children in South Asia compared to sub-Saharan which is poorer; to which they concluded a presence of covert and overt complexities were responsible. In this study the finding indicates the existence of regional differences corroborating previous research.

The two models in Table 8 with contextual variables predicting child undernutrition among LMICs, have highly significant F statistics at .05 alpha level, model 1 (F = 20.27, p < .001) and 2 (F= 21.12, p < .001). Added to this, the low VIFs indicate an absence of multicollinearity. Model 2 which is the saturated model explains the effect of all variables on stunting, severe wasting and underweight better than Model 1 when the adjusted R<sup>2</sup> is considered. It shows that when all the predictors are combined, they explain over half (57percent) of the variance in stunting, 15 percent of the variance in severe wasting, and 41percent of the variance in underweight.

**Table 8: Estimates of OLS Regression Models of State Contexts Predicting Stunting, Severe Wasting and Underweight among Under 5s in LMICs, 2013**

Predictor	Model 1			Model 2		
	<i>HAZ</i>	<i>WHZ</i>	<i>WAZ</i>	<i>HAZ</i>	<i>WHZ</i>	<i>WAZ</i>
Constant	<i>1.112***</i> (.274)	<i>-.606</i> (.347)	<i>.343***</i> (.764)	<i>-1.200***</i> (.259)	<i>-.665</i> (.362)	<i>-.718***</i> (.301)
Regional Inequality (logged)	.162 <i>.271*</i> (.120) [1.291]	.074 <i>.123</i> (.152) [1.291]	.063 <i>.105</i> (.133) [1.291]	.111 <i>.186*</i> (.117) [1.374]	.037 <i>.062</i> (.163) [1.374]	.007 <i>.011</i> (.136) [1.374]
Democracy	.048 <i>.024</i> (.036) [1.317]	.128 <i>.064</i> (.046) [1.317]	.045 <i>.023</i> (.040) [1.317]	.014 <i>.007</i> (.034) [1.330]	.109 <i>.055</i> (.048) [1.330]	.019 <i>.010</i> (.040) [1.330]
External debt	.169 <i>.270</i> (.126) [1.569]	-.085 <i>-.135</i> (.160) [1.569]	.091 <i>.145</i> (.140) [1.569]	.190 <i>.304</i> (.119) [1.573]	-.072 <i>-.116</i> (.167) [1.573]	.108 <i>.173</i> (.139) [1.573]
External trade links (logged)	-.148 <i>-.365</i> (.207) [1.754]	-.014 <i>-.034</i> (.263) [1.754]	-.166 <i>-.410</i> (.229) [1.754]	-.166 <i>-.410</i> (.198) [1.808]	-.031 <i>-.076*</i> (.277) [1.808]	-.193 <i>-.478*</i> (.230) [1.808]

Contaminated water (logged)	<i>.602</i> <i>.523**</i> (.139) [1.290]	<i>.289</i> <i>.558*</i> (.176) [1290]	<i>.545</i> <i>1.052</i> (153) [1.290]	<i>.347</i> <i>.671***</i> (.165) [2.065]	<i>.126</i> <i>.243</i> (.176) [2.065]	<i>.305</i> <i>.590*</i> (.192) [2.065]
MNC (logged)	<i>-.189</i> <i>-.562**</i> (214) [1.306]	<i>-.073</i> <i>-.216</i> (.272) [1.306]	<i>-.138</i> <i>-.409</i> (.236) [1.306]	<i>-.188</i> <i>-.543**</i> (.203) [1.329]	<i>-.073</i> <i>-.217</i> (.284) [1.329]	<i>-.141</i> <i>-.418</i> (.236) [1.329]
World Bank Region (ref.=Upper Middle Income) \$ 4,125 - \$ 12,746				<i>.464</i> <i>.090**</i> (.020) [1.96]	<i>.280</i> <i>.114**</i> (1.74) [1.96]	<i>.256</i> <i>.111**</i> (.148) [1.96]
Middle Income \$ 1,046 - \$ 4, 125				<i>.205</i> <i>.554**</i> (.177) [1.82]	<i>.039</i> <i>.424*</i> (.112) [1.82]	<i>.464</i> <i>.896*</i> (.177) [1.82]
<b>Controls</b>						
Economic Growth (logged)				<i>-.011</i> <i>-.039</i> (.231) [-1.293]	<i>.023</i> <i>.080</i> (.324) [1.293]	<i>.053</i> <i>.180</i> <i>.269</i> [.774]
Population Growth (logged)				<i>.441</i> <i>2.12***</i> (.392) [1.881]	<i>.272</i> <i>1.31</i> (.549) [1.881]	<i>.393</i> <i>1.89***</i> (456) [1.881]
Adjusted R2	<i>.461</i>	<i>.132</i>	<i>.343</i>	<i>.569</i>	<i>.156</i>	<i>.417</i>
F	<i>20.27***</i>	<i>4.434**</i>	<i>12.764***</i>	<i>21.120***</i>	<i>3.815**</i>	<i>11.904***</i>
N	121	121	121	121	121	121

Note: Unstandardized coefficients are italicized. Standard errors are in parenthesis. VIFs are in brackets. Remaining figures are the standardized coefficients.

\* $p \leq .05$  \*\*  $p \leq .01$  \*\*\*  $p \leq .001$  (1-tailed test)



Model 2 which is the better fit subsumes Model 1, and controls for economic growth and population growth. Note that the statistical significance observed in Model 1 for stunting ( $b = .271, p < .05$ ) is maintained in the full Model ( $b = .186, p < .05$ ). Interestingly, the effect of the prevalence of contaminated water on severe wasting which is present in Model 1 ( $b = .558, p < .05$ ), is suppressed in Model 2 ( $b = .243, p < .295$ ). In other words, the presence of contaminated water in Model 1 exerts an effect on severe wasting that is more than twice as strong as that in Model 2 which has the controls (i.e.  $\beta = .289$  versus  $\beta = .126$ ). This shift in significance can be attributed to the introduction of the two controls which moderate the influence of the prevalence of contaminated water on severe wasting.

Additionally, some variables of interest which are statistically significant in both models that are also highlighted in literature and related to inequality include sources of contaminated water whose effect on stunting is statistically significant in both models, i.e. Model 2 ( $b = .671, p < .001$ ), and Model 1 ( $b = .523, p < .01$ ). Other predictors that are statistically significant include external trade links ( $b = -.478, p < .05$ ), suggesting an inverse effect on underweight supported in global literature on fiscal and monetary gains (Easterly 2001; World Bank 2014). Thus, this indicates that when exports increase, child underweight decreases. I reserve the discussion on foreign direct investment (FDI) for Hypothesis 6. Interestingly, democracy and debt have no statistically significant effect on child undernutrition in these two models although mention can be made for the suppressed effect in Model 2 can be attributed to the

controls for stunting from ( $\beta = .048$  versus  $\beta = .014$ ), severe wasting ( $\beta = .128$  versus  $\beta = .109$ ) and underweight ( $\beta = .045$  versus  $\beta = .019$ ). This is contrary to current literature that proposes less conflict and less dependency for efficient food production. *Hypothesis 5: As LMICs increase foreign links through trade with other countries, the prevalence of child undernutrition also increases, controlling for economic growth, population growth, women's autonomy and women's political power.*

This hypothesis is in reference to Table 9 which includes all the variables in the study. The aim is to identify debilitating effect of trade links controlling for all other variables in the model as suggested in literature by Shandra and Shandra (2011), Larrea and Kawachi (2005), and Makki and Somwaru (2004).

Trade has been proposed to LMICs by the World Bank and a group of scholars supporting globalization and regional trade blocs. They suggest improvements in the economic growth in countries through foreign links in other words they say, the more links the better. However there is a group of other scholars who argue that the insistence of trade in a global environment with little fairness is troublesome, and affects vulnerable persons most (Agadjanian and Prata 2003; Minujin and Nandy 2012). The bivariate analysis in Table 6 reveals only inverse relationships among exports as a percent of GDP and stunting ( $r = -.069$ ,  $p < .416$ ), severe wasting ( $r = -.148$ ,  $p < .641$ ) and underweight ( $r = -.040$ ,  $p < .083$ ). What this suggests is that as trade increases and links are strengthened, the prevalence of stunting, severe wasting and

underweight decreases. Interestingly there is a weak but statistically significant positive relationship between exports and inequality.

Turning to the multivariate model in Table 9, there are two different sample sizes (Model 1: N = 132; Model 2: N = 139) arising from missing cases across all the variables. The predictors in Model 2 explain more of the variance in predicting child undernutrition than Model one considering the  $R^2$ . Model two, which comprises stunting (adjusted  $R^2 = .597$ ,  $F = 14.7$ ,  $p < .001$ ), severe wasting (adjusted  $R^2 = .178$ ,  $F = 2.99$ ,  $p < .001$ ) and underweight (adjusted  $R^2 = .421$ ,  $F = 7.715$ ,  $p < .001$ ), explains 60 percent of the variation in stunting, 18 percent of the variation in severe wasting and 42 percent of the variation in underweight respectively. When controlling for all other variables in Model 2, trade links show no statistical significance along the three dimensions of child undernutrition but show inverse effects for stunting ( $b = -.277$ ,  $p < .171$ ), severe wasting ( $b = -.090$ ,  $p < .211$ ) and underweight ( $b = -.364$ ,  $p < .167$ ). Thus, trade links do not predict child undernutrition. Since this finding does not support the research hypothesis, the hypothesis is rejected.

*Hypothesis 6:* Among LMICs there is a statistically significant and positive relationship between multinational penetration and child undernutrition controlling for all variables in the model. Wallerstein's world systems perspective posits that LMICs are inextricably linked to core countries and as such possibilities for economic growth are subject to this relationship allowing multinationals investment opportunities in a "win-win" situation. However, dependency theorists have argued against this stating

that instead what occurs is economic “extraction.” This hypothesis assumes the inevitability of this pursuit by LMICs, and seeks to ascertain if and how it predicts child undernutrition in all three dimensions.

The bivariate analysis in Table 6 indicates that there is a statistically significant negative association between foreign direct investment and stunting ( $r = -.219, p < .01$ ) underweight ( $r = -.213, p < .01$ ) and wasting ( $r = -.137, p < .110$ ). Interestingly, all the associations are inversely correlated suggesting that, as foreign direct investment increases, stunting and underweight in children decreases contradicting extant literature by Reinbold (2011), Shandra et al. (2004) and McMichael (2012) and dependency theorists.

Using the multivariate analysis in Table 8, apparently the inverse association is maintained both in Model 1, and in the saturated model. The only statistical significance noted is in stunting for both models. I find that in the model of best fit, there is a statistically significant but negative and strong effect of FDI on stunting ( $b = -.543, p < .01$ ). Thus when controlling for other variables in the model, for every unit increase in foreign direct investment, stunting decreases by 54 percent. This hypothesis is supported partially for stunting by virtue of the statistical significance, but it is rejected for severe wasting and underweight.

*Hypothesis 7:* Among LMICs there is a statistically significant positive relationship between debt and child undernutrition controlling for all variables in the model.

Debt is a sign of dependency according to World Bank literature and economists alarmed by the precarious growth in the global south (Clements et al. 2003). This hypothesis assumes a relationship based on the logic of the world systems perspective, the aftermath of SAPs, and historical evidence. The bivariate analysis in Table 6 reveals weak inverse relationships between external debt and stunting ( $r = -.020$ ,  $p < .819$ ), underweight ( $r = -.115$ ,  $p < .180$ ) and severe wasting ( $r = -.142$ ,  $p < .096$ ) lacking in statistical significance.

Findings from the multivariate analysis in Table 8 reveal similar trends. Foreign debt in Model 1 fails to predict child undernutrition across all three categories, stunting ( $b = .270$ ,  $p < .134$ ), severe wasting ( $b = -.135$ ,  $p < .443$ ) and underweight ( $b = -.145$ ,  $p < .080$ ) when control variables are excluded. When economic growth and population growth are added in Model 2, there is no meaningful effect modeled on child undernutrition as they are not statistically significant. The findings indicate an effect of external debt on stunting ( $b = .304$ ,  $p < .230$ ) suggesting partial support for the hypotheses. Similarly, as debt increases, underweight increases also indicating partial support ( $b = .173$ ,  $p < .341$ ) when controlling for all variables in the model. But in the case of severe wasting there is a notable inverse relationship which however is lacking in statistical significance ( $b = -.116$ ,  $p < .212$ ). Thus, it can be concluded that this result does not support the research hypothesis.

*Hypothesis 8:* Controlling for all variables in the model, among LMICs there is a statistically significant positive association between the prevalence of contaminated water sources and child undernutrition.

Contaminated water sources include unprotected wells, surface and vendor water. The bivariate analysis in Table 6 indicates as expected, a strong positive statistically significant relationship between the prevalence of contaminated water and child undernutrition for the dimensions of stunting ( $r = .637, p < .01$ ), and underweight ( $r = .571, p < .01$ ). For severe underweight although the relationship is statistically significant ( $r = .373, p < .01$ ) it is moderate. These findings suggest that as the prevalence of contaminated water increases, so does child undernutrition across all the measures. This finding substantiates the numerous amounts of literature targeting the success of WASH projects across the LMIC region. Examples include suggestions in literature that a reduction in the prevalence of contaminated water will lead to a reduction in its use which is expected in turn to have a positive effect on breaking the cycle of morbidity, mortality and undernutrition (Domenech 2015).

The findings for the multivariate analysis reported in Table 9 replicate the bivariate findings. There is a strong statistically significant and moderate effect on stunting ( $b = .442, p < .01$ ) for the prevalence of contaminated water, with the same case applying to underweight ( $b = .447, p < .01$ ). The effect on severe wasting is weak but statistically significant ( $b = .101, p < .05$ ). For each standard deviation increase in the prevalence of contaminated water, the standard deviation in stunting increases also by

.229 for stunting, .052 for severe wasting and .232 for underweight. This suggests that all else being equal, the proliferation of contaminated water sources will increase the prevalence of child undernutrition specifically.

The inclusion of controls markedly suppresses the magnitude of the effects on severe wasting from  $\beta = .485$  to  $\beta = .229$  for stunting, from  $\beta = .205$  to  $\beta = .052$  on severe wasting and  $\beta = .464$  to  $\beta = .232$  for underweight. Taken together these results indicate support for the research hypothesis.

**Table 9: Estimates of OLS Regression Model Predicting Stunting, Severe Wasting and Underweight among Under 5s in LMICs, 2013**

Predictor	Model 1			Model 2		
	HAZ	WHZ	WAZ	HAZ	WHZ	WAZ
Constant	1.1*** (.281)	-.353 (.359)	-.492*** (.318)	-1.15*** (.293)	-.331 (.418)	-.51*** (.351)
Regional Inequality (logged)	.134 .224 (.123) [1.4]	.113 .190 (.157) [1.4]	.060 .100 (.139) [1.4]	.074 .123 (.119) [1.5]	.079 .132 (.169) [1.5]	.002 .003 (.142) [1.5]
Democracy	.069 .034 (.037) [1.43]	.076 .038 (.047) [1.43]	.039 .019 (.042) [1.43]	.001 .004 (.035) [1.47]	.038 .019 (.050) [1.47]	.016 .088 (.042) [1.47]
External debt	.115 .183 (.128) [1.66]	-.099 -.158 (.164) [1.66]	.066 .105 (.145) [1.66]	.116 .185 (.123) [1.75]	-.084 -.135 (.175) [1.75]	.076 .122 (.147) [1.75]
External trade links (logged)	-.142 -.353 (.208) [1.82]	.036 .090 (.265) [1.82]	-.147 -.364 (.235) [1.82]	-.112 -.277 (.201) [1.97]	.042 .103 (.287) [1.97]	-.135 -.335 (.241) [1.97]

Access to contaminated water (logged)	.485 .936** (.156) [1.69]	.205 .396 (.200) [1.69]	.464 .896 (.177) [1.69]	.229 .442*** (.178) [2.51]	.052 .101 (.254) [2.51]	.232 .447** (.254) [2.51]
Gender Inequality	.182 .404 (.164) [1.37]	.059 .032 (.207) [1.37]	.123 .272 (.183) [1.37]	.110 .244 (.157) [1.49]	.004 .010 (.224) [1.49]	.052 .115 (.188) [1.49]
Women's Empowerment	-.058 -.147 (.174) [1.22]	-.228 -.577 (.222) [1.22]	-.076 -.193 (.197) [1.22]	-.070 -.176 (.169) [1.33]	-.218 -.550 (.241) [1.33]	-.069 -.175 (.203) [1.33]
Women's Vulnerable Employment (logged)	.092 .124 (.092) [1.30]	-.059 -.079 (.117) [1.30]	-.004 -.005 (.104) [1.30]	.029 .039 (.088) [1.27]	-.094 -.126 (.125) [1.27]	-.056 -.076 (.105) [1.27]
World Bank Region (ref.=Upper Middle Income- \$ 4,125 – \$ 12,746)						
Lower Middle income \$ 1,046 - \$ 4,125				.105 .065* (.019) [1.20]	.099 .504* (.075) [1.20]	.056 .004* (.012) [1.20]
Low income ≤ \$1,045				.088 .495** (.051) [1.89]	.099 .056* (.031) [1.89]	.142 .062* (.039) [1.89]
<i>Controls</i>						
Economic Growth (logged)				-.021 -.071 (.229) [1.33]	.017 .057 (.327) [1.33]	.040 .136 (.275) [1.33]



Population Growth (logged)	<i>.372</i> <i>1.79**</i> (.397) [2.03]	<i>.245</i> <i>.177</i> (.568) [2.03]	<i>.339</i> <i>.630**</i> (.476) [2.03]
Women's autonomy (logged)	<i>.109</i> <i>.155</i> (.147) [1.58]	<i>.088</i> <i>.124</i> (.144) [1.58]	<i>.172</i> <i>.244</i> (.123) [1.58]
Women's Political power	<i>-.066</i> <i>.179</i> (.133) [1.28]	<i>-.024</i> <i>-.067</i> (.255) [1.28]	<i>-.004</i> <i>-.012</i> (.214) [1.28]
Adjusted R2	.488	.164	.345
F	14.9***	3.87***	8.7***
N	132	132	132
	.597	.178	.421
	14.7***	2.9***	7.72***
	139	139	139

Note: Unstandardized coefficients are italicized. Standard errors are in parenthesis. VIFs are in brackets. Remaining figures are the standardized coefficients.

\* $p \leq .05$  \*\*  $p \leq .01$  \*\*\*  $p \leq .001$   
(1-tailed test)

## CHAPTER SUMMARY

This chapter presents the study's findings on the association and effect of women's status and state contexts on the dimensions of child undernutrition, namely stunting, severe wasting and underweight. Eight hypotheses were subjected to bivariate and multivariate analysis to determine the strength, direction and magnitude of the outcome. This paved way for a brief discussion of the correlations and the linear regression models. Out of eight hypotheses tested, four were supported, one was partially supported and three were rejected (see summary table of hypotheses in Appendix C). Fully supported implies statistical significance and a similar direction as

predicted in the hypothesis. Partially supported implies a similar direction between the calculated outcome and the hypothesized direction but a lack of statistical significance. Rejected means there is no statistical significance nor congruence in the hypothesized direction.

More specifically, Hypotheses 1 and 3 predicting gender empowerment and gender development were supported. Similarly Hypotheses 4 predicting the effect of regional inequality on child undernutrition was also supported. Finally Hypothesis 8 predicting the effect of contaminated water sources on child undernutrition was strongly supported.

Hypothesis 2 predicting women's vulnerable employment, Hypothesis 5 predicting the effect of trade links and Hypothesis 6 predicting the effect of MNC penetration were rejected. Hypotheses 5 and 6 which were basically predicting state contexts turned out to have no effect. Hypothesis 7 was partially supported predicting the effect of debt on child undernutrition.

The most important findings were mainly that women's status is enhanced through participation in political and economic decision making which provides status and opportunities for pathways to alleviate child undernutrition. Other pathways can be realized through education and enhanced livelihoods since women are living longer. Additionally increasing gender gaps and regional inequalities in the LMICs do not augur well for child undernutrition because they generate more obstacles. Women's vulnerable employment surprisingly has no observable effect on child undernutrition

contrary to expectation. However, even more surprising was the lack of significant effect on child undernutrition in LMICs from trade links, MNC penetration, and debt.

## CHAPTER V

### INTERPRETATION AND DISCUSSION

This chapter interprets and discusses the major findings of this study in two sections. The first section discusses Hypotheses 1-3 related to the first research question which seeks to investigate the extent to which the improved status of women engenders pathways to diminish the prevalence of child undernutrition across the dimensions of stunting, wasting and underweight in LMICs. The second section responds to the second research question which seeks to examine why child undernutrition is prevalent in LMICs by investigating the contextual characteristics. Hypotheses four to eight are discussed here. The chapter concludes with a brief summary.

#### PATHWAYS ENGENDERED BY WOMEN'S STATUS TO DIMINISH CHILD UNDERNUTRITION

##### *Gender Empowerment*

This study has unequivocally pointed to the improved status of women in LMICs over the past decade, and used it to investigate the prevalence of child undernutrition in the region. This perception concurs with a generous amount of currently emerging literature on the region confirming that indeed women are now living longer, they are more educated, investing in economic endeavors, and

participating in political leadership (Kabeer 2003; Yoon 2004; Hyder et al. 2005; Payne and Nassar 2006; Chant 2007; Horton 2008; Peterson 2009; Aulette and Wittner 2015). Even more significantly, they have improved participation in decision making in both the private and public spaces (Bradley and Khor 1993). An extant amount of research provides evidence of this, however, little has been done to establish its versatility on child undernutrition. Could it be that women have a superficial status that is only institutionally implied but cannot be operationalized? It is this particular concern that forms the crux of the first research question seeking to find out the extent to which women engender pathways to mitigate the child undernutrition conundrum.

It is clear that stunting, wasting and underweight are indeed prevalent in LMICs to varying degrees confirming similar cross national studies conducted within the region in the past decade (Nandy et al. 2005; Katona and Katona-Apte 2008; Minujin and Nandy 2012; UNICEF 2013; Pei, Ren, and Yan 2014). In fact just like these previous studies, stunting is found to have greater impact than the incidence of severe wasting and underweight by showing a greater amount of statistical significance on all the hypothesis tests. In addition, the findings of this study converge with recent research indicating that child undernutrition is problematic for the LMIC region in the future and is predicted to escalate up to and until 2020. For a region which is seeking to expand its economic capacity this forecast of an emerging cohort of youth that is stunted, underweight and wasted, with scant literacy and social skills to navigate adulthood successfully portends devastation.

Using the bivariate and multivariate tests for the first three hypotheses (Model 6), and the regression models in Table 7 which combine all the women's variables together in order to observe the effect, the analysis reveals two things. First, gender empowerment and gender development are the most important predictors in providing women with an opportunity to engender pathways that alleviate child undernutrition when controlling for all other predictors in the model. Specifically, the findings show full support for Hypothesis 1 modelling the effect of gender empowerment on stunting (HAZ), severe wasting, and underweight. Women's empowerment predicts a statistically significant association with child undernutrition. A look at the saturated model in Table 7 shows why it is the preferred model, and a glance at the model fit statistic indicate a higher  $R^2$ . These findings in the previous chapter concur with a plethora of extant literature on child undernutrition especially for stunting (Caulfield et al. 2004; Chen and Rogan 2004; Walker et al. 2007; Monteiro et al. 2010; Walker et al. 2015). Since the early 1990s, UNICEF and the World Food Program has warned of the dire effects of stunting which are not only physical but psychological as well. Currently the global estimate for stunting in 2011 was 26 percent which compares favorably with the finding in this study of 23 percent only for the region (Larrea and Kawachi 2005; Reinbold 2011).

The effect of gender empowerment on severe wasting indicates that as gender empowerment rises, severe wasting decreases. This finding aligns with current literature expressing that women's empowerment has an effect on child undernutrition

because of increased decision making, linked to socially responsible outcomes likely to alleviate severe wasting (Gawaya and Mukasa 2005). The significant relationship between child underweight and women's empowerment is inverse and therefore consistent with current literature from The International Food Policy Research Institute (IFPRI) projects which suggest and reiterate the inclusion of empowered women in combatting child undernutrition. The institute predicts that, including women has far reaching positive consequences such as the reduction in underweight among children under 5 years of age (Hoogvelt 2001; UNICEF 2013; World Bank 2014). In addition, women's empowerment has a positive impact on children's nutrition in LMICs all else held constant (Smith and Haddad 2000; Akyempong and Fofack 2013; UNICEF 2013).

Ultimately Hypothesis 1 is fully supported by the bivariate and multivariate analysis. This set of findings on gender empowerment predicting child undernutrition demonstrate that empowering women produces a "double dividend" both in health and in children who ultimately become resilient to the incidence of undernutrition (Acker 2004; Deo 2006). The findings also demonstrate that enhanced decision making both economic and political for women in LMICs transfers significant gains to children under five years especially with regards to their diet by monitoring the quality and quantity of food consumed. Invariably gender empowerment mitigates stunting, wasting and underweight.

### *Gender Development*

The findings resonate with the broader view that inequality gaps are not limited to the dichotomies of rich and poor. They also occur between genders as suggested by the gender stratification theory (Smith and Haddad 2003; Milanovic 2005; Seligson and Passe-Smith 2008; Peet and Hartwick 2009). In modeling the effects of gender development on stunting (HAZ), wasting (WAZ) and severe underweight (WHZ), a positive association was expected. The more gender disparity, the more child undernutrition there is conversely, the less gender disparity indicates lower incidence of child undernutrition across all measures.

Turning to the hypothesized association among gender inequality measuring disparities in education, life expectancy and estimated income, and modeling the effects of stunting (HAZ), severe wasting (WHZ) and underweight (WAZ) when controlling for all the variables in the model, the findings concur with existing literature. Indeed literature is replete with instances in LMIC where underweight, stunting and severe wasting are increasing due to inequality (Larrea and Kawachi 2005; Hong and Mishra 2006; Peterson 2009). The correlations between underweight and gender inequality show moderate statistical significance and signify that as inequality increases so too does underweight, and stunting and in children.

The assumption then is that a positive association indicates a narrowing gender gap as women live longer, earn an income and become literate. The strong apparent association becomes quickly reflected in better health among children, improving the



quality of life among them. Thus as women's status improves through gender development so does children's health. This outcome is mirrored and likely enhanced by the strong coefficients between democracy and stunting which connote at least two advantages of democracy. Mainly it is committed to the support of its citizens, for example women, and to the well-being of children (Sen 1999). The support for this hypothesis extends the arguments made in a large amount of social inequality, development and stratification literature in sociology especially arguing the debilitating effects of gender inequality (Crow and Lodha 2011; Shandra, Shandra and London 2011; UNICEF 2014). This is in addition to extant research on disparities in health, resource allocation and legal rights which demonstrates the importance of interrogating gender development in LMICs as this study is currently doing to indicate inequality gaps as counterproductive to children's well-being (Kent 2002).

For the LMIC region, findings on gender inequality remain telling because if inequality continues unabated opportunities are likely to decrease thereby driving an increase in poor health, and well-being among children. In the case of this study great inequalities also give rise to marginalization likely in remote areas which characterize the geographical and historical landscape of LMICs. This marginalization exacerbates severe wasting because of what scholars refer to as the "vulnerability paradox" (Cutter 2006).

### *Women's Vulnerable Employment*

With regard to Hypothesis 2, the study anticipated a strong positive relationship between women's vulnerable employment and stunting (HAZ), severe wasting (WHZ), and underweight (WAZ). However the study findings indicated otherwise. There is no support for Hypothesis 2 supporting new research trends on vulnerable employment in LMICs. More recent social development literature views women's vulnerable employment as an area of interest because although women are engaged in precarious work which is defined as having low returns, no tenure and includes exploitation, it offers women something they lack such as status and income (Amin et al. 2015; Aulette and Wittner 2015). For poor women in the LMIC region, any job is better than none at all because it provides a sense of purpose (Boserup 1970; Shen and Williamson 1997; Richards and Gelleny 2007).

This means that while the study findings resonate with current literature, previous relevant literature asserting the pernicious effect of vulnerable employment is contradicted (Hoogevelt 2001; Richards and Gelleny 2007; Peet and Hartwick 2009; McMichael 2012). This includes the gender stratification perspective and the world systems perspectives which have linked vulnerable employment to the "feminization of labor" and its corollary "the feminization of poverty (Kabeer and Mahmud 2004; Morrisson and Jutting 2005; Owusu-Afriye and Nketiah- Amponsah 2014).

To conclude the discussion on Hypotheses 1-3 Women's mobility which also indicates their autonomy provides useful information with regards to the cultural

definition of women's status (Hoogvelt 2001; Aulette and Wittner 2015). Research indicates that children from pastoralist backgrounds and other areas where culture demands that they seek permission before they go out in public have been found to be stunted especially when pastoralist children are compared to others from communities that allow freedom for women (Makina 2006; Brunson, Shell-Duncan, and Steele 2009).

These first three hypotheses illustrate two things that when women are educated, have an income, and occupy positions of leadership, they have a significant influence on stunting (HAZ), severe wasting (WHZ) and underweight (WAZ) as indicated in hypotheses 1 and 3 where the research hypotheses are fully supported when controlling for all variables in the model. However, women's employment seems to deviate from this pattern and shows no support for the research Hypothesis 2 leading to a rejection when controlling for all variables in the model. There is evidence from the foregoing that women's status can only use engendered pathways to diminish child undernutrition through the gender empowerment dimension, and with greater impact in the absence of gender inequalities.

#### REASONS FOR THE PREVALENCE OF CHILD UNDERNUTRITION IN LMICS

The interpretation in this second section investigating the reasons for the prevalence of child undernutrition in LMICs, utilizes the results from the analysis of contextual factors in Hypotheses 4 through 8. It makes reference to the findings in the previous chapter based on the models in Tables 8 and 9, and the bivariate correlations.

In this regard, regional inequality, trade links, multinational penetration, debt, and poor natural resources are the contextual factors considered forming the basis of this discussion. The discussion begins with the most significant findings and concludes with the least significant ones.

### *Regional Inequalities*

Inequality within LMICs is manifested in social institutions through unequal access and distribution of resources (Crow and Lodha 2011). Recent literature on the region is replete with examples of rising inequality manifested in the growing gap between the rich and the poor affecting children's growth (Pei et al. 2014; Rana and Raza 2014; Smith and Haddad 2003; World Bank 2014). Regional differences are reflected in the findings in Table 8 and 9 which depict the relationships among the low income, middle income and upper middle income regions as rated by the World Bank. The dummy variable illustrates that as expected the situation for children in the lower income region compared to upper middle income is dire. Similarly, the situation for children in middle income regions when compared to that in the upper middle income region is as dismal. Here it is evident that although the study is targeting the homogeneous aspects, heterogeneity in and of itself is a reality that may be driving child undernutrition by instigating inequality. The analysis of Hypothesis 4 focuses on the effects of regional inequalities. The saturated model in Table 8 supports hypothesis 4 for stunting adding impetus to the regression outcome. However when modelling regional inequality on severe wasting and underweight the effects are not as strong.

Thus, as regional inequality increases, so do stunting, underweight and wasting. This outcome is strongly supported in literature and seminal papers from institutions and scholars alike seeking to draw attention to the negative effects of inequality and its consequences on future generations (Pebley and Goldman 1995; Hong and Mishra 2006; World Bank 2014; Amin et al. 2015).

While not all places can be the same, there is a level of homogeneity expected that facilitates reactions towards catastrophes. In other words ‘strength in numbers.’ This seems to be lacking among LMIC states where regional inequalities that have an effect on stunting, severe wasting and underweight are embedded. Two explanations found in literature address the extent of inequalities rather well, so that the intersection between regional inequalities and child undernutrition is exposed. One is food insecurity, and the second is marginal incomes. Scholarly material in the social sciences citing food insecurity as the region’s biggest infrastructural problem go to great extent to raise red flags when food scarcity is imminent. However, when disasters strike and donor aid steps in, it is still difficult to mitigate perennial food shortage driven by regional inequalities (Panagriya 2006; Ng and Aksoy 2008). As a result, many of the LMICs are currently characterized among the net food importing countries of the world (Thomas 2006). However, this is not a solution as literature further indicates because through the importation of food governments are exposed to increased susceptibility and the vicissitudes of global markets. In addition, LMIC governments have no control over the quality of food imported nor subsequent cost,

which renders poor citizens unable to afford food purchases (Hoogvelt 2001; Jenkins and Scanlan 2001; Haile 2005; Hyder 2005; McMichael 2012). This cycle clearly shows how undernourished children easily become the order of the day.

These findings further support and confirm the historical and political interconnections which undergird the availability of food. To elaborate on this, previously the LMIC region has been organized so that governments subsidize the cost of imported foods for the benefit of the poor. However following the SAPs of the 1980s and the current neoliberal reforms, food subsidies are no longer viable. McMichael (2012) explains in detail the food crises of 2007-2008, and subsequently 2010-2011 emphasizing why regions are likely to falter economically. To stress the effect of food insecurity even further LMICs depend on food aid which a study by Rodeheaver et al. (1982) on malnutrition and food aid in Guatemala cites as having a two pronged negative effect. First, it leads to dependency among recipients, and also to donor fatigue among the providers. The point is that none of these events mitigates the situation for vulnerable children, and if anything these events aggravate their condition by compromising the quality and quantity of their food (Sen 1985; Scanlan 2000; Smith and Haddad 2000).

A second explanation relates to income. A generous amount of research indicates a historical rise in income inequality, but while rich countries are consistently searching for ways to manage it, LMICs are courting greater within country inequalities which are having a regional effect affecting the quality of life (World Bank 2014; Amin et al.

2015). Rapid rural urban migration is occurring to share in the “perceived wealth” which affects children’s diets through absentee parenting and slum dwelling (Sen 2000a).

### *The Prevalence of Contaminated Water*

This study uses the prevalence of contaminated water to indicate the poor resources available among LMICs some of which directly exacerbates child undernutrition. While most research on the region assesses the effect of water use to predict child mortality or morbidity, this research takes a different angle and assumes that it is important to also represent the converse scenario. What if we consider the areas in the region with limited choice of safe water sources? Might those be the problem areas? The univariate analysis disclosed a significant percentage of contaminated water sources in this category, at about 22 percent. When controlling for all other variables in the model, there is a strong positive relationship between the prevalence of contaminated water and stunting ( $r = .673$ ,  $p < .01$ ) as indicated in the saturated model of Table 8 which is highly reliable explaining 56 percent of the variance in the model for stunting, 16 percent for severe wasting and 41percent for underweight respectively. A good amount of literature on the region specifically focused on water and sanitation reiterate the findings of this study (Underwood 2002; Groce et al. 2011; Crow and Lodha 2011). Acknowledging the need to eradicate contaminated water sources as a way to combat child undernutrition, the latest World Bank Report (2014) reprises the prominence of water and seeks to jumpstart paths to

nutrition by dedicating 35.5 million dollars towards improving children's access to clean water in various parts of the world.

### *Debt*

Notwithstanding the good model fit statistics in Table 9 which explains 42 percent of the variance in table for underweight, 60 percent for stunting and 17 percent for severe wasting, hypothesis<sup>7</sup> is only partially supported. The bivariate analysis concurs along a similar pattern. This downplays the significance of debt which is the one reason most LMIC countries have poor economies. As such, the findings of this study contradict literature on debt from the LMIC region with specific reference to Latin America and sub-Saharan where the effects of SAPs are still evident. Debt is a recurrent theme with overt and covert consequences (Shen and Williamson 1997; Shandra et al. 2011). Recent World Bank intervention seeks to mitigate the effect of debt (Easterly 2002; Clements et al. 2003; World Bank 2014) in order to boost the potential of the LMIC region and fast track economic growth (Easterly 2001; Smith and Haddad 2002; Makki and Somwaru 2004; Vollmer et al. 2014). Subsequently, some loans in LMIC countries have been "forgiven" and grants scaled up by the Bretton Woods institutions. Perhaps this study by finding a lack of statistical significance between debt and child undernutrition indicates the effects of these positive measures which continue to outweigh the recurrent pessimistic themes.



### *Trade Links and MNC Penetration*

Literature on LMICs considers these two predictors of uttermost importance in explaining the structural complexities that underlie the child undernutrition conundrum. They indicate global links as necessary for the existence of a country and for profit based on neoliberal principals to which they subscribe. However a large body of literature shows that these structural connections while seemingly lucrative for economic “development,” may in fact be detrimental to children (Drezner 2000; Bond 2004; Sewpaul 2005; Elson 2010; Crow and Lodha 2011; Shandra et al. 2011; McMichael 2012). These studies cite the proverbial “race to the bottom” by MNCs and foreign trade as the reason behind unemployment, exploitation, and greater inequality as the repatriation of profits to the core is taking place while leaving the periphery destitute (Milanovic 2003; Smith and Seligson 2008).

This study rejected Hypotheses 5 (trade links) and 6 (MNC penetration) predicting child undernutrition across the three dimensions. This outcome contradicts the extant literature of dependency scholars which views trade as unbalanced in favor of the core countries, and an avenue for exploitation (Frank 1979; Hoogvelt 2001; Shandra et al. 2011; McMichael 2012). With regard to MNC penetration predicting child undernutrition, the findings suggest that the “paradoxes of development’ may be at play (Lind 2005). For decades in many of the LMICs conflict over resources, war, economic hardship and sporadic socio-political stability have been a norm (Osaghae 2007). As such investors have either been slow to respond and take up offers of

investment, or they have raised the price of doing business thereby leaving little profit to the host. Optimistic globalists insist that modern trade and MNC presence is safeguarded because of regulation which means that avenues of exploitation no longer exist (Bhagwati 2001; Panagariya 2003).

The recent move to trade through blocs by LMICs as a way of ensuring legitimate profit from foreign trade and spreading out costs may provide an explanation for the rejection of Hypothesis 5. The excellent examples of the East Asian economies, that have succeeded encourages LMICs to embrace modern trade and integrate technology (Seligson and Passe-Smith 2008). Emerging optimists are citing the convergence of incomes and consideration of fresh possibilities, as the underlying reason for the growth of links by LMICs into the world system (Arighi, Silver and Brewer 2003; Deaton 2006).

Finally results of this study indicate that child undernutrition is prevalent in LMICs because of structural complexities within countries that exacerbate regional inequalities and the prevalence of contaminated water. This exonerates the relationships of trade and commerce as major culprits. It is a confluence of factors among the reasons cited that is responsible for the prevalence of child undernutrition in the region rather than one single reason such as geography or exploitation through trade and multinational penetration.

## CHAPTER VI

### SUMMARY AND CONCLUSION

*When a child is undernourished, the negative consequences follow that child for his/her entire life. These negative consequences also have grave effects on the economies where s/he lives, learns and works (UN-ECA and WFP 2015).*

This dissertation has investigated the prevalence of child undernutrition in LMICs using women's status and country contexts as predictors. It has been guided by two research questions. First, to what extent is the improved status of women engendering pathways to diminish the prevalence of child undernutrition in LMICs? Second, why is child undernutrition prevalent in LMICs? Additionally, two perspectives, the world systems and gender stratification provide the conceptual framework within which my analysis of meso and macro interactions is undertaken. This concluding chapter summarizes the key findings and then details the theoretical and practical implications. Policy recommendations highlight areas of intervention. I will then discuss the limitations and contributions of this study. The chapter concludes with suggestions for future research.

#### SUMMARY

The first research question was tested using Hypotheses 1-3. The findings demonstrated support for only two hypotheses namely, the hypothesis predicting the

effect of gender empowerment on child undernutrition (H1), and the one predicting gender inequality on child undernutrition (H3). The findings did not support Hypothesis 2, which examined the effect of women's vulnerable employment on child undernutrition.

Turning to the second research question on state contexts, Hypotheses 4-8 were tested and findings show support for Hypothesis 4 predicting the effect of social inequality on child undernutrition, and hypothesis 8 predicting the effect of the prevalence of contaminated water on child undernutrition. Interestingly, there was no support for hypothesis 5 predicting the effect of trade links on child undernutrition nor Hypothesis 6 predicting the effect of MNC penetration on child undernutrition. Neither was there support for hypothesis 7 predicting the effect of debt on child undernutrition.

The remainder of this section expands on the brief summary above and considers the impact of factors associated with women's status, beginning with gender empowerment and gender development. The improved status of women is apparent in the LMIC region and in the rising number of women participating economically and politically and making decisions beyond their immediate concerns. Moreover, the improvement in women's life expectancy, education and improved income, adequately prepares women to use their status to avert incidences of child undernutrition.

It is evident that the engendered pathways championed by women are found within the current social, political and economic spaces which present opportunities that they can utilize. However, the caveat is that first the status of women must be

institutionally recognized and appreciated. This means that if women's empowerment in the region fails to achieve recognition and gender disparities flourish, then women's legal status is not acknowledged and becomes ineffective. This ineffectiveness then limits the extent to which women can alleviate child undernutrition. In other words, women can use their status to a great extent to hinder child undernutrition, but only through reliance on a social structure that is supportive. These salient findings are amplified by a growing volume of scholarly work in the region (Sudarkasa 1986; Smith and Haddad 2000; Quisumbing 2003; Yoon 2004; Hyder, Maman, Nyoni, Khasiani, Teoh, Premji and Sohani 2005; Payne and Nasser 2006; Chant 2007; Peterson 2009; Pfeiffer and Chapman 2010; McMichael 2012; Akyeampong and Fofak 2013; Global Gender Report 2013).

The research findings did not support Hypothesis 2 predicting the effect of women's vulnerable employment on child undernutrition. This contradiction has been found in other studies based on DHS surveys where a complex interaction between employment and stunting is suggested as the reason for the ambiguous results (Ukuwauni and Suchindran 2003; Eastin and Prakash 2013). New literature suggests that globalization may be benefitting women rather than eroding their gains (Larrea and Kawachi 2005). This new trajectory in emerging research suggests that for women in LMICs, any work is better than no work at all because it signifies the gaining of power through income, and the increased ability to make decisions subsequently enhancing

autonomy. Globalization has given women in LMICs opportunities to elevate their status even if only through precarious employment.

Further, employment presents an additional arena in which engendered pathways can be formulated and used by women to alleviate child undernutrition. Therefore employment accords women the much needed opportunity to determine the nutrition of their offspring.

The second research question addressed the effect of state contexts and sought to investigate the salient state characteristics that tolerate the prevalence of child undernutrition. The question inquires about the broader implications of child undernutrition in the region which stresses economic growth as a panacea regardless of the cost (Rice et al. 2000; Daniels and Adair 2004).

Statistical analysis revealed stark differences among the outcomes. Only two of the five hypotheses were supported that is, Hypothesis 4 predicting the effect of regional inequality on child undernutrition and Hypothesis 8 predicting the effect of contaminated water sources on child undernutrition. These findings are supported by a large amount of emerging literature including the works of Eastin and Prakash (2013), Anderson (2014), Vollmer et al. (2014), Oruamabo (2015) and Amin et al. (2015). Some literature seeking to propose a middle ground so as not to overlook the importance of economic growth, suggests that inequality and development have a conditional relationship, and therefore must co-exist (Drezner 2000; Easterly 2001; Smith and Seligson 2008; Boix 2009).

The reasons for the rejection on Hypotheses 5, 6 and 7 is found in extant literature suggesting a paradigm shift that is occurring in tandem with the rapidly changing global realities when LMICs are considered which is currently emphasizing a place for optimism.

#### MODIFIED PERSPECTIVES

There is a thread of theoretical perspectives and empirical studies that resonate with these findings. The gender stratification perspective supports the gender empowerment and gender development findings of this study, and argues for the provision of “safety nets” to facilitate women’s implementation of engendered pathways. Scholars within this perspective indicate that societies in which women are empowered and in which there is shared decision making exhibit less child undernutrition (Kabeer 2003; Peet and Hartwick 2009; Shandra et al. 2011).

In similar fashion, Wallerstein’s world systems perspective supports the findings of the study with reference to Hypothesis 8 modeling the effect of contaminated water, and Hypothesis 4 on the negative effects of the increasing regional inequality. Examining the core- periphery structures and relationships clarifies that the relationship though not balanced and seemingly tilted in favor of the core provides some dividend to periphery countries (Hoogvelt 2001; Kent 2002; Peet and Hartwick 2009; Mahutga and Smith 2011; McMichael 2012). Although Wallerstein’s perspective does not propose a direct way out of the child undernutrition dilemma, its current emphasis on the possibilities created by ongoing global trends suggests that trade

arrangements taking advantage of regional relationships is lucrative. Additionally, LMICs can gradually hope to see a decline in the prevalence of child undernutrition by taking advantage of existing institutionalized global regulations factored in various trade treaties, and emerging scholarly optimism.

## IMPLICATIONS

Given the detailed discussion of findings, the following theoretical and policy implications emerge:

First, the existing cross national research on child undernutrition has tended to restrict itself to the same common variables unlike cross national research on child mortality which has recently included variables engaging environmental, technological and microfinance concerns on the causes and consequences of children's deaths.

Likewise where nutrition is concerned the inclusion of "women-centric" variables would increase the scope of analysis and generate new insights and suggest alternative possibilities. From this, more practical ways of combatting the child undernutrition conundrum in LMICs can give meaning to the multitude of theoretical discourse.

Creating regional alliances using current technological means even basic ones such as text messaging connects vulnerable groups such as women living in similar geographical environments and allows them to share nutrition information pertinent to the survival of their offspring.

Newer variables are timely in incorporating topical scenarios such as the migration of women and diaspora remittances which can influence child undernutrition



by matching current trends, changing needs and situational realities to shifting theoretical paradigms. Newer variables can also serve as new thematic resources and replace overused variables such as education which though relevant may not provide impetus. For example in the last decade, most LMICs by offering free primary education have drastically reduced illiteracy gaps. New variables taking cognizance of women's increased status enhances their role as actors and not merely participants and victims. This maintaining the visibility of women and enabling them to act socially politically and economically is a precursor to mitigating child undernutrition (Sewpaul 2005).

Bolstered by the findings of this research using the gender stratification and world systems perspective invites broader sociological perspectives including and not limited to structural functionalism, conflict theory, and symbolic interactionism. This is one way of engaging diverse discourse beyond the critical analysis that has been the preserve of the sociology of development over time. The economic potential that LMICs display can only be useful if basic regional needs are specifically prioritized and addressed. Child undernutrition is one such basic regional need.

Results of this study indicate that policies focused on the lives of children surviving beyond expected mortality thresholds need to be reinforced. It is true that even though effects of stunting are irreversible and cognitive impairment may already have taken place by age 5, increasing surveillance in risk prone areas is useful. The supply of supplements and food aid to vulnerable groups such as pastoralists and

nomads in a systematic targeted way may be an initial step in guaranteeing the quality of future generations in LMICs (UNICEF 2003; Nandy et al. 2005). The prevalence of child undernutrition is an indictment on existing LMIC governments purporting to safeguard children's well-being.

Of uttermost importance is the provision of clean drinking water to reduce the prevalence and use of contaminated water sources, and support the nutritional needs of children. Through construction of boreholes or water conservation techniques via WASH<sup>43</sup> initiatives LMICs can initiate local projects through private partnership to minimize costs without depending on global intervention. Similarly, suggestions for a focus on gender parity are indicated in this study to enable women utilize the full spectrum of their status benefits (Bauer 2004). While it may be argued that women are not a homogeneous group and therefore general remedial measures through legislation are unrealistic, this study indicates that the benefits of women's empowerment and gender parity are transcendent enough to inspire group incentives to mitigate harsh realities rather than individual gain (Mohanty 2003).

Finally the suggested socio-economic costs of child undernutrition on the health sector, education sector and on productivity does not augur well for the economic potential of the region. Regional cooperation is necessary for sharing costs and efficiently allocating benefits as such regional trading blocs are a viable alternative.

---

<sup>43</sup>WASH- Is an acronym that refers to Water and Sanitation Hygiene.

Already the emergence of BRICS<sup>44</sup> for economic pursuit is one such regional bloc seeking financial solutions to various problems. If child undernutrition is tackled as regional problem, future loss can be forestalled. Moreover the need to frequently assess and replace outdated strategy is better appreciated at a regional level which ensures that the issue is not politicized. Finally, the presence of child undernutrition in LMICs as a topical concern indicates the need to support ongoing research within institutions of higher learning whose contribution to regional discourse is currently lacking.

#### POLICY RECOMMENDATIONS

In addition to the above mentioned implications, a number of targeted policy recommendations can be extrapolated.

It is evident from the findings of this study that child undernutrition is still a challenge to LMICs despite pockets of economic growth experienced across the region in the last two decades. Having said this, my recommendations are intended to address ways of controlling the prevalence of child undernutrition within LMICs as a concerted effort for the long-term.

These recommendations are operationalized at the macro level to align with the study design and to harness regional capabilities. Evidence suggests that matching regional resources and needs is key to mitigating child undernutrition. Thus, the potential each country has within the region can be shared across borders with other countries that may be less endowed holding regional conflict constant. For example

---

<sup>44</sup>This acronym refers to the following countries, Brazil, Russia, India, China and Singapore.

well-endowed countries in Latin America which have managed to reduce child undernutrition, would be keen on sharing their best practice with countries in South Asia or sub-Saharan Africa.

Following the findings of this study, efforts to empower women using regional specific programs is one way to mitigate child undernutrition without antagonizing cultural and religious institutions. As noted, educating women, enabling them to make economic decisions as well as preparing them for political participation is key to achieving gender empowerment. In addition partnerships with men on various agenda related to child well-being will provide positive outcomes.

Poor diets affect concentration and school retention putting children at risk for dropping out of school. To female students, this means the potential for underage pregnancy, early marriage and poor maternal health rises. For boys it leads to increased engagement in crime and early poverty. In order to break these cycles, community feeding programs to supplement families in need with children under the age of 5 years will help avert developmental deficits linked to undernutrition early on. Added to this, the establishment of a national nutrition database to monitor impending and ongoing nutrition deficit is crucial both to research and to inform recurrent policy implementation.

Harmonizing the national strategy with regional goals for women would provide multidimensional gains. By encouraging cross border partnerships shared resources beyond microfinance is key in surmounting child undernutrition. By making

women active participants and urging their involvement means tapping into practical reservoirs of knowledge; as this study has shown, gender empowerment depresses child undernutrition while gender disparities exacerbate it. Additionally involving civil society and social movements to advance a “women’s rights approach” as opposed to a “rights based agenda” avoids the misconception of attempts to impose Western ideology. This also makes it easier to implement future strategy in a timely manner without having to first overcome misplaced suspicion (Sen 1985; Roy 2002; Mohanty 2003; Akiyeampong and Fofack 2013).

Finally, in order to bridge the regional inequality gaps which this research has elucidated, philanthropy should be explored as a source of support for the mitigation of child undernutrition. Within each country in the region there is the wealthy class whose responsibility can be impressed upon. While it is not expected that the wealthy in South Asia will assist the poor in sub-Saharan Africa to the exclusion of the poor in that region, the coordination of regional philanthropic effort should not be ignored. By resorting to regional philanthropy an avenue is created for stakeholder driven investment. The mitigation of child undernutrition becomes no longer an individual family effort, but a collective responsibility.

#### CONTRIBUTIONS AND LIMITATIONS

The interest in research on children’s nutritional deficit in the LMIC region has only recently drawn sustained attention. This is after the realization that proliferation of child undernutrition is intrinsically linked to ongoing regional inequalities and is likely

to disrupt the intended future economic success of the region. This research makes three specific contributions, one theoretical, another methodological and a third one empirical. This study draws attention to the wave of genuine universal interest in the welfare of children, and the competing institutional rigidity and regional complacency. The study uses gender disparities in existing regional social structures, and regional differences shaped by existing global linkages to argue that the prevalence of child undernutrition in LMICs is alarming and a future impediment to socio economic growth.

By using the world systems and gender stratification perspective, the scope of this research expands existing interest in child undernutrition in LMICs (Shandra et al. 2004). Previous studies have confined the analysis of child undernutrition to health models yet many other possibilities exist to enrich a general understanding of the magnitude of this problem (Smith and Haddad 2000). This study took advantage of the existing possibilities by combining the gender stratification and world systems perspectives which readily provided a conceptual framework accommodating regional and global socio- structural contradictions while painting realities in real time.

Using a self-constructed data set combining two measures concerned with women's status and analyzing their effect on child undernutrition with convincing outcomes indicates the need to capitalize on increased status of women as active participants in society. None of the studies researching child undernutrition in LMICs has combined these lucrative measures yet the etiological significance of women's

status with regards to child undernutrition cannot be overemphasized (see Figure 2 in Appendix D). Indeed while the significance of women's status in the LMIC has been a subject of debate over the last couple of years, little has been done to establish its versatility on child undernutrition. Thus, this study differs from other studies in this regard because it assumed that social, economic and political status gains have been made, but they need to be mainstreamed and applied to the mitigation efforts (Smith and Haddad 2000). This research contributes substantively to literature on child undernutrition across the dimensions of stunting, wasting and underweight; and gender and regional relationships by using a bigger sample size than most recent studies (N = 139). Past research using similar design and sharing some of the variables has sampled 35 to 70 countries due to problems of data availability (Ahktar 2006; Vollmer et al. 2014).

Finally, the policy recommendations have been deliberately designed to foster regional cohesion during implementation. Regional cohesion for resource poor LMICs is the way maximize several advantages and minimize a multitude of costs as the regions seek to overcome the child undernutrition problem.

#### *Limitations*

Although this research is an insightful step toward investigating the interrelationships among women's status, regional contexts and child undernutrition, there are a number of methodological and theoretical limitations.

First, related to the use of secondary data sets is the problem of missing cases. Although the World Bank Development Indicators (WDI) database has been running since 1960 and includes annual data on countries, problems of consistency exist because it relies on individual countries to independently collect and submit data. As such, there is an over representation of countries with better resources. In addition, standards of verifiability have not been set for the use of macro data. Although preliminary runs were conducted to ensure that there was enough information available for the variables of interest, it cannot escape mention that for my dependent variable, there is more data available for stunting than there is for wasting possibly due to the intrinsic nature of the measure which presents complexities. There is currently debate on the dependability of the measure for underweight since it doesn't distinguish whether weight loss occurred steadily over time due to chronic deprivation or drastically in the recent past due to an acute shock. So while time is an important factor in stunting and severe wasting, indicating a chronic level, the underweight measure is less reliable. This ambiguity for the underweight score is resolved by corroborating the percentages with historical occurrence to explain gaps in data presentation. For example if there was a famine or war in the region, the measurements will capture this to justify the loss in weight of body fat. In addition, measures like GDP per capita are not equally measured across time, several gaps exist in the data set and as such means have to be imputed with greater time lapses to aggregate a representative score for analysis (Acock 2005). This directly leads to the problem of sample skewing, which



was rectified statistically in this study using log10 transformation. Seligson and Passe-Smith (2008) express a cautionary note and explain in depth how sample skewing occurs mainly as a result of overestimation, but they encourage rather than deter macro research using available data sets such as the World Bank dataset despite such anomalies. They stress that it is only by using these imperfect datasets that problems can be addressed.

Having purposely selected the year of analysis as 2013, the substantial number of missing cases would have reduced my sample size further. In order to maintain a large enough sample size, I used the multiple imputation technique whose credibility outweighs its shortcomings as a reliable technique used in recent research (Royston 2004; Donders et al. 2006). This imputation technique increased my number of observations substantially (N=139) and enabled the avoidance of larger sampling errors which would have affected the outcomes of the statistical analysis. I did not conduct inter regional comparisons because of the impending drop in sample size when computing scores for specific measures. Smith and Haddad (2000) on the other hand, conducting research in developing countries on child malnutrition, used interregional comparisons and managed to keep their sample size through panel analysis and the use of fixed effects in addition to allowing multiple observations of the same variable in the data set. Since the World Bank dataset did not represent information for all my variables I had to resort to other sources of information in compiling my final dataset. Additionally, this study may be unable to replicate across time and space with the exact

same outcomes because of incomplete data for multiple points in time. While a panel design would have overcome a number of the aforementioned problems, the advantages of cross section studies including a glance at a situation at a specific point in time need not be overlooked (Babbie 2012).

The indicators used for measuring women's status are drawn from the United Nations measures of women's status from the Human Development Index (HDI) and Gender Development index (GDI). Typically, the UN does not conduct interviews or administer surveys but uses information that countries have collected. Thus they have no control over the quality or the representation of observations. Additionally, the GEM is problematic (Walby 2005), it is macro in outlook and may omit the representation of women's participation at local levels which may be greater significance than their participation in formal institutions such as parliament. A lack of data ensues and as a consequence, GEM underestimates the role of women for example in politics or on measures such as employment (Paxton and Hughes 2007).

Sager and Najam (1998) presented a critical view of the Human Development Index stating that while it is an important alternative to the traditional unidimensional measures of development it omits ecological considerations failing thereby to capture cultural and regional essence (Sen 2000b). Comparing design and reality check they proposed modifications but lauded its multidimensionality. It is for the latter reason this study proceeded to use the index.

Clearer definitions of women's status would be helpful to research. As a result, like most other research on women's status this study resorted to the use of measures that have shortcomings with regards scope. While aggregated indexes are convenient they are known to omit crucial information. Bradley and Khor (1993) reiterate this problem of using indexes by proposing a practical framework that is applicable to women in LMICs including reference to the private and public spaces arguing that the use of broad indexes though a default, obscures important features of women's lives. Due to this deficiency of a universal measure for women's status the research was unable to include useful information on stratification systems such as rural urban differences, specific types of vulnerable employment and types of economic resources women actually have power over. Therefore the study was restricted to generalizations.

#### FUTURE RESEARCH

This study points to a number of directions for future research. First, it can be replicated by changing the data source of the dependent variable to the original MICs<sup>45</sup> data. Hence researchers could proceed to combine the three measures of the dependent variable using a technique proposed by Peter Svedberg (2000) to construct a composite index of anthropometric failure (CIAF), thereby computing the dependent variable as a single measure. So far only three studies have reported the use of CIAF with convincing results, smaller standard errors and easily interpretable hypotheses (Pei et al. 2014; Nandy et al. 2005). This index examines the relationship between distinct

---

<sup>45</sup>Multiple Indicators Cluster Surveys (MICS) are household surveys that monitor the condition of women and children. They measure progress towards internationally agreed goals. They have been conducted by UNICEF since 1995.

subgroups of anthropometric failure, poverty and morbidity (Nandy et al. 2005). One of its advantages is that you have only one sample mean as opposed to three, and even after computation the data can be disaggregated to enable identification of specific children in need of urgent intervention. Future research should focus on combining the three measures into one. For LMICs this would be very convenient considering that anatomical structures vary and a researcher may erroneously confuse wasting for stunting.

Additionally, future researchers should seek to establish cause and effect beyond the commonly used estimates of association by using techniques of data analysis such as structural equation modeling (SEM). One advantage of SEM relevant here is that it is useful in identifying with precision the exact pathways of influence to diminish child undernutrition which is beneficial to both scholars and policy makers.

A qualitative ethnographic study can be undertaken as a follow-up to this study using the case study method comparing differences between the better performing LMICs and the worst performing with a view to revealing the weakest areas with the most prevalence. Although this is ambitious, it will provide complimentary information to quantitative efforts which only partly reveals the problem and excludes social cultural nuances.

Finally, given the weakness of the GEM and the purely inequality focused GDI as measures for women's status, future researchers may resort to using the *WomanStats* database. This is relatively new broad based dataset with multiple variables and an

inbuilt codebook. It is easy to navigate and can express a larger number of dimensions of women's status including women's rights data relevant to LMICs. Within it, one can find data that are culturally sensitive, legal information on property ownership and the individual rights of women capturing therefore an expanded view of women's own perception of their status in society beyond the commonly over- used indicators such as education and income.

## REFERENCES

- Acemoglu, Daron, Simon Johnson, and James A. Robinson. 2002. "Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution." *Economics* 117(4):1231.
- Acker, Joan. 2004. "Gender, Capitalism and Globalization." *Critical Sociology* 30(1):24-46.
- Acock, Alan C. 2005. "Working with Missing Values." *Journal of Marriage and Family* 64(4):1012-1028.
- Afridi, Farzana. 2010. "Women's Empowerment and the Goal of Parity between the Sexes in Schooling in India." *Population Studies* 64(2):131-145.
- Agadjanian, Victor and Ndola Prata. 2003. "Civil War and Child Health: Regional and Ethnic Dimensions of Child Immunization and Malnutrition in Angola." *Social Science and Medicine* 56:2515-2527.
- Ahmad, Omar, Alan D. Lopez, and Mie Inoue. 2000. "The Decline in Child Mortality: A Reappraisal." *Bulletin of the World Health Organization* 78(10):1175-1191.
- Akyeampong, Emmanuel and Hippolyte Fofack. 2013. "The Contribution of African Women to Economic Growth and Development in Post-Colonial Africa: Historical Perspectives and Policy Implications." Working Paper No. 6537, The World Bank, Washington, DC.
- Alderman, Harold, John Hoddinott and Bill Kinsey. 2006. "Long Term Consequences of Early Childhood Malnutrition." *Oxford Economic Papers* 58(3):450-474.

- Amin, Mohammad, Veselin Kuntchev and Martin Schmidt. 2015. "Gender Inequality and Growth: The Case of Rich vs. Poor Countries." Policy Research Working Paper No. 7172, World Bank Group-Development Economics Global Indicators, Washington, DC.
- Amin, Samir. 2006. "The Millennium Development Goals: A Critique from the South." *Monthly Review* 57(10).
- Anderson, Tim. 2014. "Human Development, the State and Participation." *Development Studies Research* 1(1):64-74.
- Alkirie, Sabina. 2002. "Dimensions of Human Development." *World Development* 30(2):181-205.
- Arrighi, Giovanni, Beverly J. Silver, Benjamin D. Brewer. 2003. "Industrial Convergence, Globalization and the Persistence of the North-South Divide." *Studies in Comparative International Development* 38(1):3-31.
- Asiedu, Elizabeth. 2002. "On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa Different?" *World Development* 30(1):107-119.
- Aulette, Judy Root and Judith Wittner. 2015. *Gendered Worlds*. 3rd ed. NY: Oxford University Press.
- Babbie, Earl R. 2013. *The Structure of Social Research*. 14th ed. Boston, MA: Cengage Learning.

- Bauer, Gretchen. 2004a. "The Hand That Stirs the Pot Can Also Run the Country": Electing Women to Parliament in Namibia. *The Journal of Modern Africa Studies* 42(4):479-509.
- Bauer, Gretchen. 2012b. "Let there be a balance: Women in African Parliaments." *Political Studies Review* 10:370-384.
- Benson, Todd and Meera Shekar. 2006. "Trends and Issues in Child Undernutrition" Pp. 87-106 in *Disease and Mortality in Sub-Saharan Africa*, edited by Jamison Dean T. Richard G. Feachem, Malegapuru W. Makgoba, Eduard R. Bos, Florence K. Baingana, Karen J. Hofman, and Khama O. Rogo. 2nd ed. Washington, DC: World Bank.
- Berg, Alan D. 1970. "Nutrition as a National Priority. Lessons from the Indian experiment." *American Journal of Clinical Nutrition* 23:1396-1408.
- Birdsall, Nancy, Ruth Levine, and Amina Ibrahim. 2005. "Towards Universal Primary Education: investments, incentives, and institutions." *European Journal of Education* 40(3).
- Black, Robert E., Saul S. Morris and Jennifer Bryce. 2003. "Where and Why are 10 Million Children Dying Every Year?" *Lancet* 361:2226-34.
- Black, Robert E., L H. Allen, Z A. Bhutta, and L E Caulford. 2008. "Maternal and Child Undernutrition: Global and Regional Exposures and Health Consequences." *Lancet* 371:243-60.



- Boix, Carles. 2009. "The Conditional Relationship between Inequality and Development." *Political Science and Politics* 42(4):645-649.
- Bornschieer, Volker, Christopher Chase-Dunn and Richard Rubinson. 1978. "Cross National Evidence and the Effects of Foreign Investment and Aid on Economic Growth and Inequality: A Survey of Findings and Re-Analysis." *American Journal of Sociology* 84(3):651-683.
- Bradshaw, Sarah. 2013. "Women's Decision Making in Rural and Urban Households in Nicaragua: the influence of income and ideology." *Environment and Urbanization* 25(1):81-94.
- Bradley, Karen and Diana Khor. 1993. "Toward an Integration of Theory and Research on the Status of Women." *Gender and Society* 7(3):347-378.
- Brown, Nick J., Martin P. Ward Platt, and R. Mark Beattie. 2015. "Women, Children and Global Public Health: Beyond the Millennium Development Goals" *British Medical Journal* 350:h1755.
- Brunson, Emily K., Bettina Shell-Duncan, M. Steele. 2009. "Women's Autonomy and its Relationship to Children's Nutrition among the Rendille of Northern Kenya." *American Journal of Human Biology* 21(1):55-64.
- Bryce, Jennifer, Denise Coitinho, Ian Darnton-Hill, David Pelletier, Per Pinstrup-Andersen. 2008. "Maternal and child undernutrition: effective action at national level." *Lancet* 317:510-526.

- Bryceson, Deborah Fahy. 2002. "The Scramble in Africa: Re-orienting Rural Livelihoods." *World Development* 30(5):725-739.
- Cai, Xiaodong and David W. Brown. 2011. "Monitoring Child Undernutrition at National Levels Before and After the Economic and Food Crises: Data from 20 countries." *The Open Nutrition Journal* (5):19-23.
- Caulfield, Laura E., Stephanie A. Richard, and Richard E. Black. 2004. "Undernutrition as an Underlying Cause of Malaria Morbidity and Mortality in Children Less Than 5 years Old." *American Journal of Tropical Medicine and Hygiene* 7(2):55-63.
- Caulfield, Laura E., Mercedes de Onis, Robert E. Black. 2004. "Undernutrition as an Underlying Cause of Child Deaths Associated with Diarrhea, Pneumonia, Malaria, and Measles." *American Journal of Clinical Nutrition* 80:193-98.
- Central Intelligence Agency DATA. 2008. "The World Fact book" Retrieved September 10, 2014 (<https://www.cia.gov/library/publications/the-world-factbook/>).
- Chant, Sylvia. 2007. "Re- thinking the feminization of Poverty in relation to Aggregate Gender Indices." *Journal of Human Development* 7(2):201-220.
- Chant, Sylvia. 2008. Review of *Gender, Generation and Poverty: Exploring the "Feminization of Poverty" in Africa, Asia and Latin America* by Susan Greenhalgh. *Population and Development* 34(4):791-792.

- Chant, Sylvia and Caroline Sweetman. 2012. "Fixing women or Fixing the World? 'Smart Economics', Efficiency Approaches, and Gender Equality in Development." *Gender and Development* 20(3):517-529.
- Chirot, Daniel and Thomas D. Hall. 1982. "World System Theory." *Annual Review of Sociology* (8):81-106.
- Clements, Benedict, Rina Bhattacharya and Toan Quoc Nguyen. 2003. "External Debt, Public Investment, and Growth in Low Income Countries." Working Paper N0. 249, International Monetary Fund, Washington, DC.
- Clemens, Michael A., Charles J. Kenny and Todd J. Moss. 2007. "The trouble with the MDGs: Confronting Expectations of Aid and Development Success." *World Development* 35(5):735-751.
- Croteau, David and Hoynes William. 2013. *Experience Sociology*. NY: McGraw Hill.
- Crow, Ben and Suresh K. Lodha. 2011. *The Atlas of Global Inequalities*. Berkeley, CA: University of California Press.
- Das, S., Rahman, R.M. 2011. "Application of Ordinal Logistic Regression Analysis in determining Risk Factors of Child Malnutrition in Bangladesh." *Nutrition Journal* 10 (24):1-11.
- Deo, Nandini. 2006. "Is Globalization Our Friend? Women's Allies in the Developing World." *Current History* 105(689):105-111.

- De Onis, Mercedes and Moniker Blossner. 2003. "The World Health Organization Global Database on Child Growth and Malnutrition; Methodology and Applications." *International Epidemiological Association* 32:518-526.
- De Onis, Mercedes and Moniker Blossner. 2003. "The World Health Organization Global Database on Child Growth and Malnutrition; Methodology and Applications." *International Epidemiological Association* 32:518-526.
- Domenech, Laia. 2015. "Is Reliable Water Access the Solution to Undernutrition? A Review of the Potential of Irrigation to Solve Nutrition and Gender Gaps in Africa South of the Sahara." Working Paper No. 01428, International Food Policy Research Institute, Washington, DC.
- Dollar, David and Aart Kraay. 2002. "Spreading the Wealth." *Foreign Affairs* 81(1): 120-133.
- Donders A. Rogier T., Geert J. M. G. van der Heijden, Theo Stijnen, Karel G.M. Moons. 2006. "Review: a Gentle Introduction to Imputation of Missing Values." *Journal of Clinical Epidemiology* 59:1087-1091.
- Drezner, Daniel W. 2000. "Bottom Feeders." *Foreign Policy* 121:64-70.
- Durkheim, Emile. 1947. *Elementary Forms of Religious Life*. Glencoe, IL: Free press.
- Easterly, William. 2001. The lost decades: developing countries stagnation in spite of policy reform 1980-1998. *Journal of Economic Growth* 6:135-157.

- Easterly, William. 2002. "How Did Heavily Indebted Poor Countries Become Heavily Indebted? Reviewing Two Decades of Debt Relief." *World Development* 30(10):1677-1696.
- Eastin, Joshua and Aseem Prakash. 2013. "Economic Development and Gender Equality: Is There a Gender Kuznets Curve?" *World Politics* 65(1):156-186.
- Elson, Diane. 2010. "Gender and the Global Economic Crisis in Developing Countries: a Framework for Analysis." *Gender and Development* 18(2):201-212.
- Fofack, Hippolyte. 2013. "A Model of Gendered Production in Colonial Africa and Implications for Development in the Post-Colonial Period." Policy Research Working Paper No. 6438. The World Bank, Washington, DC.
- Frank, Andre, Gunder. 1979. *Dependent Accumulation and Underdevelopment*. New York: Monthly Review Press.
- Gane, Nicholas. 2014. "Sociology and Neoliberalism: A Missing History." *Sociology* 48(6):1092-1106.
- Gawaya, Rose and Rosemary Semafumu Mukasa. 2005. "The African Women's Protocol: A New Dimension for Women's Rights in Africa." *Gender and Development* 13(3):42-50.
- Gawaya, Rose. 2008. "Investing in Women farmers to Eliminate Food Insecurity in Southern Africa: Policy-Related Research from Mozambique." *Gender and Development* 16(1):147-159.

- Ghosh, Jatati. 2001. *Globalization, Export-Oriented Employment for Women and Social Policy Series*, United Nations, Research Institute for Social development, New York, United Nations.
- Glewwe, Paul and Edward A. Miguel. 2008. "The Impact of Child Health and Nutrition on Education in Less Developed Countries." Pp. 210-218 in *Handbook of Development Economics*. Vol. 4, edited by T. P. Shultz and J. Strauss. Amsterdam: North Holland.
- Global Gender Gap Report. World Economic Forum. 2013. "Committed to Improving the State of The World." Retrieved July 12, 2014 (<http://www.weforum.org/reports/global-gender-gap-report-2013>).
- Godfrey, H. C., J.R. Beddington, I. R. Crute, Lisa Haddad, D. Lawrence, J. F Muir, J. Pretty, S. Robinson, S. M. Thomas and Camilla C. Toulmin. 2010. "Food Security: The Challenge of Feeding 9 Billion People." *Science* 327(S967):812-8.
- Groce, Nora, N. Bailey, Raymond Lang, Jean- Francois Trani and Maria Kett. 2011. "Water and Sanitation Issues for Persons with Disabilities in Low- and Middle-Income Countries: A Literature Review and Discussion of Implications for Global Health and International Development." *Journal of Water and Health* 9(4):617-627.

- Gwatkin, Davidson R. 2000a. "Health Inequalities and the Health of the Poor: What Do We Know? What Can We Do?" *Bulletin of the World Health Organization* 78(1):3-18.
- Gwatkin, Davidson R. 2000b. "Poverty and Inequalities in Health within Developing Countries: Filling the Information Gap." Pp. 88-92 in *Poverty, Inequality, and Health: An International Perspective*, edited by David A. Leon and Gill Walt. Oxford: Oxford University Press.
- Habimana, Phanuel, Kasonde Mwinga, Charles Sagoe-Moses, Tigest Ketsela. 2010. "Progress in Implementing the Child Survival Strategy in the African Region." *The African Health Monitor* 18-23.
- Handelman, Howard. 2013. *The Challenge of Third World Development*. New Jersey: The Pearson Education Inc.
- Hansford, Frances. 2010. "The Nutrition Transition: a Gender Perspective with Reference to Brazil." *Gender and Development* 18(3):439-452.
- Heady, D. Derek. 2012. "Developmental Drivers of Nutritional Change: a Cross-Country Analysis." *World Development* 42:76-88.
- Hien, Nguyen Ngoc and Nguyen Ngoc Hoa. 2009. "Nutritional Status and Determinants of Malnutrition in Children Under Three Years of Age in Nghean, Vietnam." *Pakistan Journal of Nutrition* 958-964.

- Holmes, Rebecca and Rachel Slater. 2008. "Measuring Progress on Gender and Agriculture in the 1982 and 2008 World Development Reports." *Gender and Development* 16(1):27-40.
- Hong, Rathavuth and Vinod Mishra. 2006. "Effect of Wealth Inequality on Chronic Undernutrition in Cambodian Children." *Journal of Health and Population Nutrition* 24(1):89-99.
- Hoogvelt, Ankie. 2001. *Globalization and the Post-Colonial World: The New Political Economy of Development* 2nd ed. Maryland: Johns Hopkins University Press.
- Horton, Richard. 2008. "Maternal and Child Undernutrition: An Urgent Opportunity." *The Lancet* 371.
- Hutcheson, G D. 2011. "Ordinary Least-Squares Regression." Pp. 224-228 in *The SAGE Dictionary of Quantitative Management Research*, edited by L. Moutinho and G. D. Hutcheson. Manchester University.
- Inter Parliamentary Union. 2001. "The PARLINE Database." Retrieved June 26, 2014 (<http://www.ipu.org/wmn-e/arc/classif151200.htm2004>).
- Isbister, John. 2001. *Promises Not Kept: The Betrayal of Social Change in the Third World*. 5th ed. Connecticut: Kumarian Press.
- Ivanic, Maros and Will Martin. 2008. "Implications of Higher Global Food Prices for Poverty in Low Income Countries." *Agricultural Economics* 2008(39):405-416.



- Iyengar, Venkatesh G. and Padmanabhan P. Nair. 2000. "Global Outlook on Nutrition and the Environment: Meeting the Challenges of the Next Millennium." *Science of the Total Environment* 249(1-3):331-346.
- Jaggar, Alison M. 2002. "Vulnerable Women and Neo-Liberal Globalization: Debt Burdens Undermine Women's Health in the Global South." *Theoretical Medicine* 23:425-440.
- Jejeebhoy, Shireen J. 2002. "Convergence and Divergence in Spouses' Perspectives on Women's autonomy in Rural India." *Studies in Family Planning* 33(4):299-308.
- Jenkins, Craig J. and Stephen J. Scanlan. 2001. "Food Security in Less Developed Countries 1970 to 1990." *American Sociological Review* (66):718-744.
- Jorgenson, Andrew K. 2006. "Global warming and the Neglected Greenhouse Gas: A Cross- National Study of the Social Causes of Methane Emissions Intensity, 1995." *Social Forces* 85:1779-1798.
- Jorgenson, Andrew K., Christopher Dick, and John M. Shandra. 2011. "World Economy, World Society, and Environmental Harms in Less- Developed Countries." *Sociological Inquiry* 81(1):53-87.
- Kabeer, Naila. 2003. *Gender Mainstreaming in Poverty Eradication and the Millennium Development Goals: A Handbook for Policymakers and Other Stake holders*. London, England: The Commonwealth Secretariat.

- Kabeer, Naila, and Simeen Mahmud. 2004. "Globalization, Gender and Poverty: Bangladeshi Women Workers in Export and Local Markets." *Journal of International Development* 16(1):93-109.
- Katona, P and Katona-Apte J. 2008. "The Interaction between Nutrition and Infection." *Clinical Infectious Diseases* 46:1582-1588.
- Keusch, Gerald T. 2003. "The History of Nutrition: Malnutrition, Infection and Immunity." *Journal of Nutrition*, 133(1):336S-340S.
- Kent, George. 2002. "A Gendered Perspective on Nutrition Rights." *Agenda Empowering Women for Gender Equity* 51:43-50.
- Kostovicova, Denisa and Vesna Bojicic-dzelilovic, eds. 2009. *Persistent State Weakness in the Global Age*. Burlington, VT: Ashgate.
- King, Elizabeth and Andrew Mason. 2001. *Engendering Development: Through Gender Equality in Rights, Resources, and Voice*. World Bank Policy Research Report, World Bank, Washington DC.
- Komlos, John and Lukas Meermann. 2007. "The Introduction of Anthropometrics into Development and Labor Economics." *Historical Social Research* 32(1):260-270.
- Kleinbaum, David, Larry Kupper, Azhar Nizam, and Eli S. Rosenberg. 2014. *Applied Regression Analysis and Other Multivariable Methods*. 5th ed. Boston, MA: Cengage Learning

- Krugman, Paul and Anthony J. Venables. 1995. "Globalization and the Inequality of Nations." Working Paper No. 5098, National Bureau of Economic Research, Cambridge, MA.
- Kuonquii, Christopher. 2006. "Is Human Development a New Paradigm for Development? Capabilities Approach, Neoliberalism and Paradigm shifts." Presented at the August 2006 International Conference "freedom and justice" of the Human Development and Capability Association (HDCA). Groningen, Netherlands.
- Larrea, Carlos and Ichiro Kawachi. 2005. "Does Economic Inequality Affect Child Malnutrition? The Case of Ecuador." *Social Science & Medicine* 60(1):165–78.
- Lenski, Gerhard E. 1966. *Power and Privilege: A theory of Social Stratification*. New York, NY: McGraw Hill.
- Levine, Timothy R. and Hullet Craig R. 2002. "Eta Squared, Partial Eta Squared and Misreporting of Effect Size in Communication Research." *Human Communication Research* 28(4):612-625.
- Lind, Amy. 2005. *Gendered Paradoxes: Women's Movements, State Restructuring, and Global Development in Ecuador*. PA: The Pennsylvania State University Press.
- Liu, Li, Hope L. Johnson, Simon Cousens, Jamie Perin, Susana Scott, Susana Scott, Joy E. Lawn, Igor Rudan, Harry Campbell, Richard Cibulskis, Mengying Li, Colin Mathers and Robert E. Black. 2012. "Global, Regional, and National

- Causes of Child Mortality: An Updated Systematic Analysis for 2010 with Time Trends since 2000.” *Lancet* 379(9832):2151-2161.
- Lutter, K. Chessa and Juan A. Rivera. 2003. “Nutritional Status of Infants and Young Children and Characteristics of their Diets. *The American Society for Nutrition Sciences Journal of Nutrition* 133:2941S.
- Mahutga Matthew C. and David A. Smith. “Globalization, the Structure of the world Economy and Economic Development.” *Social Science Research* 40:257-272.
- Makina, Anesu. 2006. “Same Old Challenges: Life 21 Years after the United Nations Decade for Women.” *Agenda: Empowering Women for Gender Equity* 69:92-99.
- Makki, Shiva S. and Agapi Somwaru. 2004. “Impact of FDI and Trade on economic Growth: Evidence from Developing Countries.” *American Journal of Agricultural Economics* 86(3):795-801.
- Maluccio, John A., John Hoddinott, Jere. R. Behrman, Reynaldo Martorell, Agnes. R. Quisumbing, and Aryeh. D. Stein. 2009. “The Impact of Improving Nutrition during Early Childhood on Education among Guatemalan Adults.” *Economic Journal* 119:734–763.
- Mangyo E. 2008. “The Effect of Water Accessibility on Child Health in China.” *Journal of Health Economics* (27):1343-1356.

- Marsh, Robert M. 2014. "Getting Ahead and Falling Behind: A Sociological Elaboration of Sen's Theory of Human Development." *Social Science Quarterly* 94(4):1001-1021.
- Mason, Karen Oppenheim. 1986. "The Status of Women: Conceptual and Methodological Issues in Demographic Studies." *Sociological Forum* 1(2):284-300.
- Matte, Thomas D., Michaeline Bresnahan, Melissa D. Beggs and Ezra Susser. 2001. "Influence of the variation in birth weight within normal range and within sibships on IQ at age 7 years: Cohort Study." *British Medical Journal* 323:310-4.
- McMichael, Philip. 2000. "World-Systems Analysis, Globalization and Incorporated Comparison." *Journal of World Systems Research* 6(3):68-99.
- McMichael, Philip. 2012. *Development and Social Change: A Global Perspective*. 5<sup>th</sup> ed. California, CA: Pine Forge Press.
- Meade, Melinda S. and Michael Emch. 2010. *Medical Geography*. New York, NY: Guilford Press.
- Mies, Maria. 1998. *Patriarchy and Accumulation on a World Scale: Women in the International Division of Labour*. New York, NY: Zed Books Ltd.
- Milanovic, Branko. 2005. *Worlds Apart: Measuring International and Global Inequality*. NJ: Princeton.

- Minujin, Alberto and Shailen Nandy. 2012. *Global Child Poverty and Well-Being: Measurements, Concepts, Policy and Action*. Bristol, UK: Policy Press.
- Mohanty, Chandra Talpade. 2003. *Feminism without Borders: Decolonizing Theory, Practicing Solidarity*. London, UK: Duke University Press.
- Monshipouri, Mahmood, Claude E. Welch Jr., and Evan T. Kennedy. 2003. "Multinational Corporations and the Ethics of Global Responsibility: Problems and Possibilities." *Human Rights Quarterly* 24:965.
- Monshipouri, Mahmood. 2014. "Promoting Universal Human Rights: Dilemmas of Integrating Developing Countries." *Yale Human Rights Development Journal* 4(1):25-38.
- Monteiro, Carlos Augusto, Maria Helena D'Aquino Benicio, Wolney Lisboa Conde, Silvia Konno, Ana Lucia Lovadino, Aluisio J. D. Barros and Cesar Gomes Victora. 2010. "Narrowing Socioeconomic Inequality in Child Stunting: The Brazilian Experience, 1974-2007." *Bulletin of the World Health Organization* 88:305-311.
- Mosley, W. Henry and Chen Lincoln .1984. "An Analytical Framework for the Study of Child Survival in Developing Countries." *Population and Development Review* 10 Suppl 25- 45.
- Mukherjee, MR, Chaturvedi LCS, Bhalwar, CR. 2008. "Determinants of Nutritional Status of School Children." *Medical Journal of the Armed Forces India* 64:227-231.

- Nachmias, Chava Frankfort and Anna Leon-Guerrero. 2006. *Social Statistics for a Diverse Society*. 4th ed. CA: Pine Forge Press.
- Nandy, Shailen, Michelle Irving, David Gordon, S.V. Subramanian, and George Davey Smith. 2005. "Poverty, Child Undernutrition and Morbidity: New Evidence from India." *Bulletin of WHO* 83(3):210-216.
- Ng, Francis and M. Ataman Aksoy. 2008. "Who Are the Net Food Importing Countries?" Working Paper No. 4457, World Bank Research Development Group Trade Team, Washington, DC.
- Nugent, Colleen and John M. Shandra. 2009. "State Environmental Protection Efforts, Women's Status, and World Polity." *Organization and Environment* 22(2):208-229.
- Olack, Beatrice, Heather Burke, Leonard Cosmas, Sapna Bamrah, Kathleen Dooling, Daniel R. Feikin, Leisel E. Talley, and Robert F. Breiman. 2011. "Nutritional Status of Under- Five Children Living in an Informal Urban Settlement in Nairobi, Kenya." *Journal of Health Population and Nutrition* 29(4):357-363.
- Oruamabo, R. S. 2015. "Child Malnutrition and the Millennium Development Goals; Much Haste but Less Speed?" *Archives of Disease in Childhood* 100:S19-22.
- Osaghae, Eghosa. E. 2007. "Fragile States." *Development in Practice* 17(4/5):691-699.
- Owusu-Afriyie, John and Edward Nketiah-Amponsah. 2014. "An Individual Level Test of the "Feminization of Poverty" Hypothesis: Evidence from Ghana," *Sage* 30(1):25-43.

- Payne, Richard J. and Jamal R. Nassar. 2006. *Politics and Culture in the Developing World: The Impact of Globalization*. New York, NY: Pearson.
- Pebley, Anne R. and Noreen Goldman. 1995. "Social Inequality and Children's Growth in Guatemala." *Health Transition Review* 5:1-20.
- Peet, Richard and Elaine Hartwick. 2009. *Theories of Development; Contentions, Arguments, Alternatives*. New York, NY: Guilford Press.
- Pei, Leilei, Lin Ren, and Hong Yan. 2014. "A Survey of Undernutrition in Children Under Three Years of Age in Rural Western China." *BMC Public Health* 14: 121.
- Pelletier, David. L., E. A. Frongillo Jr., D. G. Schroeder, Jean- Pierre Habicht. 1995. "The Effects of Malnutrition on Child Mortality in Developing Countries." *Bulletin of the World Health Organization* (73):443-8.
- Peterson, Kristine. 2009. "Childhood Undernutrition: A Failing Global Priority." *Journal of Public Health Policy* 30(4):455-464.
- Pfeiffer, James and Rachel Chapman. 2010. "Anthropological Perspectives on Structural Adjustment and Public Health." *The Annual Review of Anthropology* 39:149-65.
- Polanyi, Karl. 1944. *The Great Transformation*. New York: Rinehart.
- Popkin, Barry M. 2001. "The Nutrition Transition and Obesity in the Developing World." *The American Society for Nutritional Sciences* 131(3):871S-873S.



- Potera, Carol. 2004. "The Opposite of Obesity: "Undernutrition Overwhelms the World's Children." *Environmental Health Perspectives* 112(14):A802.
- Pritchett, Lant and Lawrence h. Summers. "Wealthier is Healthier." Working Paper No. 1150, World Development Report, The World Bank, Washington, DC.
- Puddington, Arch. 2012. Freedom in the World 2012: The Arab Uprisings and Their Global Repercussions. Retrieved July 22, 2014  
[https://freedomhouse.org/sites/default/files/inline\\_images/FIW%202012%20Booklet--Final.pdf](https://freedomhouse.org/sites/default/files/inline_images/FIW%202012%20Booklet--Final.pdf))
- Quisumbing, Agnes. 2003. *Household Decisions, Gender and Development: A Synthesis of Recent Research*. Washington, USA: International Food Policy Research.
- Rana Ejaz Ali Khan Toseef Azid and Muhammad Ali Raza. 2014. Child Malnutrition in Developing Economies: A Case Study of Bangladesh. *Qualitative Quantitative* 48:1389-1408.
- Ravallion, Martin. 2001. "Growth, Inequality and Poverty- Looking Beyond Averages." *World Development* 29(11):1803-1815.
- Reinbold, Gary W. 2011. "Economic Inequality and Child stunting in Bangladesh and Kenya: An investigation of Six Hypotheses." *Population Development Review* 37(4):691-719.

- Renner, James Kweku. 2011. *Concern for Nigerian Surviving Children and National Development: The Nutrition Perspective*. Lagos, Nigeria: University of Lagos Press.
- Rice, Amy L., Lisa Sacco, Adnan Hyder and Robert E. Black. 2000. "Malnutrition as an Underlying Cause of Childhood Deaths Associated with Infectious Disease in Developing Countries." *Bulletin of World Health Organization* 78(10):1207-1221.
- Richards, David L. and Ronald Gelleny. 2007. "Women's Status and Economic Globalization." *International Studies Quarterly* 51(4):855-876.
- Ridgeway, Cecilia L. 1997. "Interaction and the Conservation of Gender Inequality: Considering Employment." *American Sociological Review* 62:218-235.
- Rodeheaver, Daniel Gilbert, Frederick L. Bates, and Arthur D. Murphy. 1982. *Malnutrition and Food Aid Programs: A Case Study from Guatemala*. UNT Digital Library. Retrieved May 20, 2015(<http://digital.library.unt.edu/ark:/67531/metadc84342/>).
- Rosegrant, Mark W. and Sarah A. Cline. 2003. "Global Food Security: Challenges and Policies." *Science* 302:1918.
- Royston, Patrick. 2004. "Multiple imputation of missing values." *The Stata Journal* 4(3):227-241.
- Rubington, Earl and Martin Weinberg S. 2011. *The Study of Social Problems: Seven Perspectives*. NY: Oxford University Press.

- Sayem, Amir Mohammed, Abu Taher Sanaullah Nury and Delwar Hossain. 2011. "Achieving the Millennium Development Goal for Under-five Mortality in Bangladesh: Current Status and Lessons for issues and Challenges for Further Improvements." *Journal of Health Population and Nutrition* 29(2):92-102.
- Seligson, Mitchell A. and John T. Passe-Smith. 2008. *Development and Underdevelopment: The Political Economy of Global Inequality*. Boulder: Lynne Rienner.
- Sen, Amartya. 1985. *Commodities and Capabilities*. Amsterdam: Elsevier.
- Sen, Amartya. 1999. "Democracy as a Universal Value." *Journal of Democracy* 10(3):3-17.
- Sen, Amartya. 2000a. *Development as Freedom*. New York: Random House.
- Sen, Amartya. 2000b. "A Decade of Human Development" *Journal of Human Development*. 1(1):17-82.
- Sewpaul, Vishanthie. 2005. "Feminism and Globalisation: The Promise of Beijing and Neoliberal Capitalism in Africa." *Agenda: Empowering Women for Gender Equity* 64:104-113.
- Shandra, John M., Jenna Nobles, Bruce London, John B. Williamson. 2004. "Dependency, Democracy, and Infant Mortality: A Quantitative, Cross-National analysis of Less Developed Countries." *Social Science and Medicine* 59:321-333.

- Shandra, Carrie L., John M. Shandra and Bruce London. 2011. "World Bank Structural Adjustment, Water, and Sanitation: A Cross-National Analysis of Child Mortality in Sub-Saharan Africa." *Organization and Environment* 24(2):107-129.
- Shen, Ce and John B. Williamson. 1997. "Child Mortality, Women's Status, Economic Dependency, and State Strength; A Cross-National Study of Less Developed Countries." *Social Forces* 76(20):667-700.
- Shen, Ce and John B. Williamson. 2001. "Accounting for Cross-National Differences in Infant Mortality Decline (1965-1991) Among Less Developed Countries: Effects of Women's Status, Economic Dependency, And State Strength." *Social Indicators Research* 53:257-288.
- Slusser, Suzanne. 2009. "Gender Empowerment and Gender Inequality, The Global Economy and the State: Exploring the Relationship between Economic Dependency, The Political Order, and Women's Status." PhD dissertation, Department of Sociology, University of Akron, Ohio.
- Smith, Lisa C. and Lawrence Haddad. 2000. *Explaining Child Malnutrition in Developing Countries: A Cross-Country Analysis*. Washington D.C: International Food Policy Research Institute.
- Smith, Lisa and Lawrence Haddad. 2002. "How Potent Is Economic Growth in Reducing Undernutrition? What Are the Pathways of Impact? New Cross-Country Evidence." *Economic Development and Cultural Change* 51(1):55-76.

- Smith, Lisa C., Usha Ramakrishnan, Aida Ndiaye, Lawrence Haddad and Reynaldo Martorell. 2003. *The Importance of Women's Status for Child Nutrition in Developing Countries*. Washington D.C. International Food Policy Research Institute.
- Spieldoch, Alexandra. 2007. *A Row to Hoe: The Gender Impact of Trade Liberalization on our Food System, Agricultural Markets and Women's Human Rights.* Geneva: Friedrich Ebert- Stiftung.
- Stiglitz, Joseph E. 2003. *Globalization and its Discontents*. New York, NY: W. W. Norton.
- Stiglitz, Joseph E., Amartya Sen, and Jean- Paul Fitoussi. 2009. "Report by the Commission on the Measurement of economic and Social Progress." Presented at the first plenary meeting of the Commission on the Measurement of economic and Social Progress, April 22-23, 2008, Paris, France.
- Storey, Andy. 2000. "The World Bank, Neo liberalism, and Power: Discourse and Implication for Campaigners." *Development in Practice* 10(3/4):361-370.
- Subramanyam, Malavika A., Ichiro Kawachi, Lisa F. Berkman, S.V. Subramanian. 2011. "Is Economic Growth Associated with Reduction in Child Undernutrition in India." *PLoS Med* 8(3).
- Subramanyam, Malavika A., Ichiro Kawachi, Lisa F. Berkman, S.V. Subramanian. 2010. "Socioeconomic Inequalities in Childhood Undernutrition in India; Analyzing Trends between 1992 and 2005." *PLoSOne* 5(6)1-9.

- Sumner, Andy. 2012. "Where Do The Poor Live?" *World Development* 40(5):865-877.
- Svedberg, Peter. 2000. *Poverty and Under-nutrition: Theory, Measurement, and Policy*. New Delhi: Oxford University Press.
- Svedberg, Peter. 2001. "Undernutrition Overestimated" Discussion Paper, Institute for International Economic Studies, Sweden-Stockholm.
- Sweet, Stephen and Karen Grace- Martin. 2012. *Data Analysis with SPSS: A First Course in Applied Statistics*. 4<sup>th</sup> ed. Boston, MA: Allyn and Bacon.
- Tabachnick Barbara G. and Linda S. Fidell. 2013. *Using Multivariate Statistics*. 6th ed. New Jersey, NJ: Pearson
- Tamale, Sylvia. 2004. "Gender Trauma in Africa: Enhancing Women's Links to Resources." *Journal of African Law* 48:50-61.
- Therborn, Goran. 2006. *Inequalities of the World: New Theoretical Frameworks, Multiple Empirical Approaches*. London, England: Verso.
- Trusty, Jerry, Bruce Thompson and John V. Petrocelli. 2004. Practical Guide for Reporting Effect size in Quantitative Research." *Journal of Counselling and Development* 82(1):107-110.
- Tumwine, James K., John Thompson, Munguti Katua-Katua, Mark Mujwajuzi. 2002. "Diarrhoea and Effects of Different Water Sources, Sanitation and Hygiene Behaviour in East Africa." *Tropical Medicine and International Health* 7(9): 750-756.

- Ukwuani, Festus. A and Chirayath M. Suchindran. 2003. "Implications of women's work for nutritional status in sub-Saharan Africa: A case study of Nigeria." *Social Science and Medicine* 56(10):2109-2121.
- Umukoro, Nathaniel. 2014. "Democracy and Inequality in Nigeria." *Sage* 30(1):1-24.
- Underwood, Barbara. 2002. "Undernutrition." Pp. 229-237 in *Critical Issues in Global Health*, edited by C. E. Koop, C. E. Pearson, and M. R. Schwarz. San Francisco, CA: Jossey-Bass.
- UNICEF. 1990. "Strategy for Improved Nutrition of Women and Children in Developing Countries." Retrieved September 15, 2013([http://www.ceecis.org/iodine/01\\_global/01\\_pl/01\\_01\\_other\\_1992\\_unicef.pdf](http://www.ceecis.org/iodine/01_global/01_pl/01_01_other_1992_unicef.pdf)).
- UNICEF. 2006. *The State of the World's Children: Excluded and Invisible*. New York. Retrieved October 23, 2014. (<http://www.unicef.org/sowc06/>).
- UNICEF. 2006. *The State of the World's Children: Women and Children, the Double Dividend of Gender Equality*. New York. Retrieved October 23, 2014. (<http://www.unicef.org/sowc06/>).
- UNICEF. 2013. *Committing to Child Survival: A Promise Renewed*. New York. Retrieved December 3, 2014. ([http://www.unicef.org/lac/Committing\\_to\\_Child\\_Survival\\_APR\\_9\\_Sept\\_2013.pdf](http://www.unicef.org/lac/Committing_to_Child_Survival_APR_9_Sept_2013.pdf)).

- UNICEF. 2014. "The State of the World's Children in Numbers-Every Child Counts."  
New York. Retrieved February, 2015.  
(<http://www.unicef.org/sowc2014/numbers/>).
- United Nations Development Program. 2008. "Fighting Climate Change: Human  
Solidarity in a Divided World." Retrieved June 10, 2014,  
([http://hdr.undp.org/sites/default/files/reports/268/hdr\\_20072008\\_en\\_complete.pdf](http://hdr.undp.org/sites/default/files/reports/268/hdr_20072008_en_complete.pdf))
- United Nations Development Program. 2013. "The Rise of the South: Human Progress  
in a Diverse World." Retrieved June 10, 2014,  
([http://hdr.undp.org/sites/default/files/reports/14/hdr2013\\_en\\_complete.pdf](http://hdr.undp.org/sites/default/files/reports/14/hdr2013_en_complete.pdf))
- United Nations Economic Commission for Africa and World Food Program. 2015.  
"The Cost of Hunger in Malawi: Social and Economic Impacts of Child  
Undernutrition in Malawi-Implications on National Development and Vision  
2020.
- Victora, Cesar G. 1992. "The Association between Wasting and Stunting: An  
International perspective." *Journal of Nutrition* 122:1105-10.
- Victora, Cesar G, Linda Adair, Caroline Fall, Pedro Hallal C., Reynaldo Martorell,  
Linda Richter and Hashpal Singh Sachdev. 2008. "Maternal and Child  
Undernutrition: Consequences for Adult Health and Human Capital." *Lancet*  
371 (9609):340-357.
- Vollmer, Sebastian, Kenneth Harttgen, Malavika A. Subramanyam, Jocelyn Klasen, S.  
V. Subramanian. 2014. "Association between economic growth and early



childhood undernutrition; evidence from 121 Demographic and Health Surveys from 36 low income and middle income countries.” *The Lancet Global* 2(4): e225-e234.

Wagstaff, Adam. 2000. “Socioeconomic Inequalities in Child Mortality: Comparisons across Nine Developing Countries.” *Bulletin of the World Health Organization* 78(1):19-29.

Wagstaff, Adam and Naoko Watanabe. 2000. “Socioeconomic Inequalities in Child Malnutrition in the Developing World.” Population Policy Research Working paper Series No. 2434, The World Bank, Washington, DC.

Wagstaff, Adam, Flavia Bustreo, Jennefer Bryce, Mariam Claeson and the WHO – World Bank Child Health and Poverty Working Group. 2004. “Child Health: Reaching the Poor.” *American Journal of Public Health* 94(5):726-736.

Walker, Susan P., Theodore D. Wachs, Julie Meeks Gardner, Betsy Lozoff, Gail A Wasserman, Ernesto Pollitt, Julie A Carter, and the International Child Development Steering Group. 2007. “Child Development: Risk Factors for Adverse Outcomes in Developing Countries.” *The Lancet* 369

Walker, Susan P., Susan M Chang, Amika Wright, Clive Osmond, and Sally M Grantham-McGregor. 2015. “Early Childhood Stunting Is Associated with Lower Developmental Levels in the Subsequent Generation of Children.” *The Journal of Nutrition* 145(4): 823-828.

Wallerstein, Immanuel. 1974. *The Modern World System. Vol 1, Capitalist agriculture*

- and the Origins of the European World-Economy in the 16<sup>th</sup> Century*. New York, NY: Academic Press.
- Wallerstein, Immanuel. 1979. "The Capitalist World-Economy by Douglas Rimmer." *The Economic Journal* 89(355):721-722.
- Weeks, John. 2012. *Population: An Introduction to Concepts and Issues*. 2<sup>nd</sup> ed. CA: Wadsworth.
- Wermuth, Laurie and Miriam Ma'at-Ka-Re Monges. 2002. "A Structural Model for Examining Case Examples of Women in Less-Developed Countries." *Frontiers: A Journal of Women Studies* 23(1):1-22.
- Whitehead, Ann and Naila Kabeer. 2001. "Living with Uncertainty: Gender, Livelihoods and Pro-Poor Growth in Rural sub-Saharan Africa." Working Paper No. 134, Institute of Development Studies, Sussex, England.
- World Bank 2007. "World Development Report: Development and the Next Generation." Retrieved January 22, 2014 ([http://www.wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2006/09/13/00011242\\_20060913111024/Rendered/PDF/359990WDR0complete.pdf](http://www.wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2006/09/13/00011242_20060913111024/Rendered/PDF/359990WDR0complete.pdf)).
- World Bank Data. 2014. *World Development Indicators*. Retrieved January 22, 2014 (<http://data.worldbank.org/data-catalog/world-development-indicators>).
- World Bank. 2014. "Annual Report of the World Bank." Retrieved April 5, 2015 (Worldbank.org/annualreport2014).

- World Health Organization. 1999. "Management of Severe Malnutrition: A Manual for Physicians and Other Senior Health Workers." Geneva, Switzerland: WHO.
- Wuehler, Sara E., Sonja Y. Hess, and Kenneth H. Brown. 2011. "Accelerating Improvements in Nutritional and Health Status of Young Children in the Sahel Region of Sub-Saharan Africa: Review of International Guidelines on Infant and Young Child Feeding and Nutrition." *Maternal and Child Nutrition* 7(s1):6-34.
- Yoon, Mi Yung. 2004. "Explaining Women's Legislative Representation in sub-Saharan Africa." *Legislative Studies Quarterly* 29(3):447-468.
- York, Richard and Christina Ergas. 2011. "Women's Status and World-System Position: An Exploratory Analysis." *American Sociological Association* 17(1):147-164.
- Zaracostas, John. 2008. Halving Child Deaths by 2015 Is "Still Possible" *British Medical Journal* 336(7637):175.
- Zottarelli, Lisa K., T.S Sunil, S. Rajaram. 2007. "Influence of Parental and Socio-Economic Factors on Stunting in Children Under 5 Years in Egypt." *Eastern Mediterranean Health* 13(6):1330-1342.



APPENDIX A  
WORLD BANKS LIST OF LMIC COUNTRIES

**LOW INCOME**  
(≤ \$1,045)

**LOWER MIDDLE  
INCOME**  
(\$ 1,046 - \$ 4,125)

**UPPER MIDDLE INCOME**  
(\$ 4,125 - \$ 12,746)

Afghanistan	Armenia	Albania
Bangladesh	Bhutan	Algeria
Benin	Bolivia	American Samoa
Burkina Faso	Cabo Verde	Angola
Burundi	Cameroon	Argentina
Cambodia	Congo, Rep.	Azerbaijan
Central African Republic	Cote d'Ivoire	Belarus
Chad	Djibouti	Belize
Comoros	Egypt, Arab Rep.	Bosnia and Herzegovina
Congo, Dem. Rep.	El Salvador	Botswana
Eritrea	Georgia	Brazil
Ethiopia	Ghana	Bulgaria
Gambia, The	Guatemala	China
Guinea	Guyana	Colombia
Guinea-Bissau	Honduras	Costa Rica
Haiti	India	Cuba
Kenya	Indonesia	Dominica
Korea, Dem. Rep.	Kiribati	Dominican Republic
Liberia	Kosovo	Ecuador
Madagascar	Kyrgyz Republic	Fiji
Malawi	Lao PDR	Gabon
Mali	Lesotho	Grenada
Mozambique	Mauritania	Hungary
Myanmar	Micronesia, Fed. Sts.	Iran, Islamic Rep.
Nepal	Moldova	Iraq
Niger	Mongolia	Jamaica
Rwanda	Morocco	Jordan
Sierra Leone	Nicaragua	Kazakhstan
Somalia	Nigeria	Lebanon
Tajikistan	Pakistan	Libya
Tanzania	Papua New Guinea	Macedonia, FYR
Togo	Paraguay	Malaysia
Uganda	Philippines	Maldives
Zimbabwe	Samoa	Marshall Islands
	Sao Tome and Principe	Mauritius
	Senegal	Mexico
	Solomon Islands	Montenegro

	South Sudan	Namibia
	Sri Lanka	Palau
	Sudan	Panama
	Swaziland	Peru
	Syrian Arab Republic	Romania
	Timor-Leste	Serbia
	Ukraine	Seychelles
	Uzbekistan	South Africa
	Vanuatu	St. Lucia
	Vietnam	St. Vincent and the Grenadines
	West Bank and Gaza	Suriname
	Yemen, Rep.	Thailand
	Zambia	Tonga
		Tunisia
		Turkey
		Turkmenistan
		Tuvalu
		Venezuela, RB

\*Source: World Development Indicators  
(Last updated 04/14/2015)

## APPENDIX B

Table 10: Partial Eta<sup>2</sup> for all Predictors



**Table 10: Partial Eta's Squared for All Predictors in the Analysis of Child Undernutrition in Low and Middle Income Countries, 2013**

Predictor	Model 1 (HAZ)	Model 2 (WHZ)	Model 3 (WAZ)
Gender	.225	.049	.136
Development			
Gender	.058	.094	.062
Empowerment			
Employment	.609	.411	.627
Women's	.466	.365	.486
Autonomy			
Political	.310	.202	.241
Leadership			
Democracy	.222	.168	.189
Foreign	.185	.184	.224
Investment			
Dependency	.519	.360	.414
Inequality	.292	.573	.230
Economic Growth	.105	.171	.122
Poor Natural	.572	.492	.569
Resources			
Population Growth	.465	.241	.358
Rate			
Integration	.477	.395	.464

The values of partial eta's squared ( $\eta^2$ ) presented in Table reveal that the predictors had mixed effect on the likelihood of stunting (HAZ), severe wasting (WHZ) and underweight(WAZ).

## APPENDIX C

### Summary of Findings by Hypothesis

**Table 11: Summary of Findings by Hypotheses**

Hypothesis	Predictor	Dependent Variable	Correlation Results	Regression Results
H1	GEM	HAZ	Supported	Supported
		WHZ	Supported	Supported
		WAZ	Supported	Partially supported
H2	Women's Vulnerable Employment	HAZ	No support	No support
		WHZ	Partially supported	No support
		WAZ	No support	No support
H3	Gender Development (GDI)	HAZ	Supported	Supported
		WHZ	Supported	Supported
		WAZ	Supported	*Partially supported
H4	Regional Inequality	HAZ	Supported	Supported
		WHZ	*Partially supported	*Partially supported
		WAZ	*Partially supported	*Partially supported
H5	Trade Links	HAZ	No support	No support
		WHZ	No support	No support
		WAZ	No support	No support
H6	MNC penetration	HAZ	No support	Partial support
		WHZ	No support	No support
		WAZ	No support	No support
H7	Debt	HAZ	Partially supported	Partially supported
		WHZ	Partially supported	No support
		WAZ	Partially supported	Partially supported
H8	Contaminated water sources	HAZ	Supported	Supported
		WHZ	Supported	Supported
		WAZ	Supported	Supported

HAZ – Stunting

WHZ – Severe wasting

WAZ – Underweight

MNC – Multinational Corporation

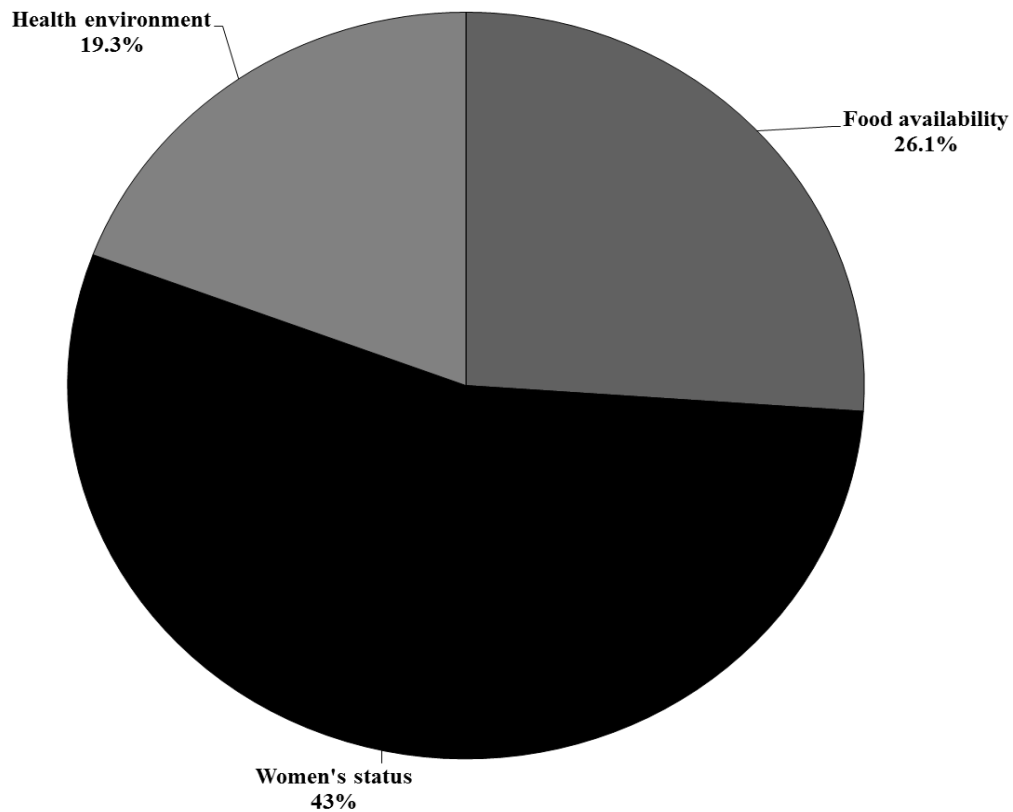
GEM – Gender Empowerment Measure

GDI – Gender Development Index

\* Partially supported means that results were in the hypothesized direction but not significant, they were considered however to support the hypotheses but with a caveat

NB: Results were considered to offer no support to the hypothesis if they were in the opposite direction and were also not statistically significant.

APPENDIX D  
Determinants to Reductions in Child Undernutrition



**Source:** Modified from L. Smith and L. Haddad, "Overcoming Child Malnutrition in Developing Countries: Past Performance, Future Possibilities," "Draft 2020 Vision for Food, Agriculture, and the Environment Discussion Paper (Washington, D.C.: International Food Policy Research Institute, photocopy).

**Figure 2: Estimated contribution of major determinants to reductions in child undernutrition, 1970-95 in LMICs**

APPENDIX E

IRB Letter of Approval



**Institutional Review Board**  
Office of Research and Sponsored Programs  
P.O. Box 425619, Denton, TX 76204-5619  
940-898-3378  
email: IRB@twu.edu  
<http://www.twu.edu/irb.html>

DATE: December 11, 2014

TO: Ms. Kathleen Anangwe  
Sociology & Social Work

FROM: Institutional Review Board - Denton

*Re: Exemption for Child Under-Nutrition in Low – and Middle – Income Countries: How Do National Contexts and Women’s Status Fit In? (Protocol #: 17974)*

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and was determined to be exempt from further review.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. Because a signed consent form is not required for exempt studies, the filing of signatures of participants with the TWU IRB is not necessary.

Although your protocol has been exempted from further IRB review and your protocol file has been closed, any modifications to this study must be submitted for review to the IRB using the Modification Request Form. Additionally, the IRB must be notified immediately of any adverse events or unanticipated problems. All forms are located on the IRB website. If you have any questions, please contact the TWU IRB.

cc. Dr. Celia Lo, Sociology & Social Work  
Dr. James L. Williams, Sociology & Social Work  
Graduate School