DEVELOPMENT OF WOMEN EMPOWERMENT INDEX FOR THE INDIAN APPAREL INDUSTRY

A Dissertation Proposal is

Presented to

The Faculty of the Graduate School

At the University of Missouri

In Partial Fulfillment

Of the Requirements for the Degree

Doctor of Philosophy

By

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July 2016
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DEVELOPMENT OF WOMEN EMPOWERMENT INDEX FOR THE
INDIAN APPAREL INDUSTRY

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Dr. Randall Westgren
To my Family and Friends
I would like to extend my sincere gratitude to my advisors, committee members, parents and friends for their devoted instructions, valuable contributions, committed support and warmhearted help which enabled me to complete the dissertation.

My special thanks to Dr. Jung Ha-Brookshire. Having her as my advisor is one of the luckiest things in my life. During my five-year stay in the TAM department, Dr. Ha-Brookshire never stopped inspiring me and fostering the development of my academic thoughts. From conceptual model building to very detailed paper editing, Dr. Ha-Brookshire’s dedicated advice, constructive suggestions and countless help were throughout the whole writing process for this dissertation.

I also want to thank Dr. Randall Westgren, Dr. Pamela Norum, and Dr. Sarah Southworth for taking time off their busy schedule to be on my dissertation committee. The research idea would never have been realized without Dr. Westgren’s constant encouragements and support. I owe a great debt to his kindness and patience in guiding me to design the dissertation. I also feel deeply honored to have Dr. Norum, willing to serve in the committee. Her extensive knowledge in the field, broad vision and thoughtful comments helped improve the quality of the dissertation a lot. I sincerely appreciate Dr. Southworth’s valuable contribution as well. Dr. Southworth’s valuable insights from non economic perspectives, helped me to evolve into a better researcher. Without them, my dissertation would not have been possible.

I would also like to thank my family and friends. My parents have been my constant support system. I also owe a great debt to my friend, Akash for making me feel at home even when I am thousands of miles away from home.
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CHAPTER I: INTRODUCTION

The introduction includes the following sections: (a) Background of the study, (b) Purpose of the study, (c) Significance of the study, (d) Definition of key terms, (e) Guiding paradigms and research assumptions, and (f) Organization of the study.

Background of the Study

Women in the Indian Apparel Industry

India is the seventh largest apparel exporter in the world, with exporting U.S. $17.75 billion worth of apparel in the 2014-2015 period (World Trade Organization, 2016). The industry is a significant contributor to the economy, both in terms of its domestic share and exports. It accounts for a phenomenal 14 % of total industrial production; around 4.78 % share in the country's total exports in 2014-15 (ibef, 2016). The Indian apparel industry employs 7 million people as a part of its workforce, and aims to double this figure by 2020-2021. It is the second largest provider of employment in the country behind agriculture (AEPC, 2016). About 48 % of India's apparel are being exported to Europe. United States of America and Middle East countries also form the main clients of Indian apparel exports (Umarji, 2015).

The Indian labor market displays several striking features, such as very low rates of female labor force participation; considerable variance in rates of female labor force participation across Indian states; and a large share of both women and men working in the informal sectors (Das et al., 2015). India has one of the lowest female labor force participation (FLFP) rates among emerging markets and developing countries to the surprise to many. At around 27 % at the national level in 2015-26, India’s FLFP rate is well below the global average of around 50 %
and East Asia average of around 63% (Ministry of Statistics & Programme Implementation, 2015). Out of 1.26 billion persons in 2015-2016 in India, only 125 million of the roughly 380 million working-age Indian females are seeking work or are currently employed (Population Reference Bureau, 2015). Female labor force participation has been on a declining trend in India, in contrast to most other regions, particularly since 2004-2005. India’s labor force participation rate for women fell from just over 37% in 2004-05 to 27% in 2015-16. Out of 131 countries, India ranks 11th from the bottom in female labor force participation (World Economic Forum, 2014). These low rates are largely due to cultural attitudes and social norms about women in the workplace (Pande & Moore, 2015). Despite the rapid economic growth in India in recent years, there is a declining female labor force participation rates across all age groups, across all education levels, and in both urban and rural areas (ILO, 2013).

The trend can be partly explained as Indian economy grows, more households have additional income, discouraging women in wealthier households from workforce participation (Das et. al., 2015). Another potential cause is the decline in employment opportunities for women, as they face increased competition with men for scarce jobs (ILO, 2013). In terms of declining employment opportunities, occupational segregation plays an important role in holding women back. Women in India tend to be grouped in certain industries and occupations, such as basic agriculture, sales and elementary services, handicraft manufacturing, and apparel industry. The female labor force participate rate in the Indian apparel industry was found to be 80% in 2014 (Saha, 2014). Saha (2014) also found that 65% of the women working in the Indian apparel industry are married with 40% of them living below the poverty line and 70% earning a monthly salary of US$30-$50. Failure to allow women full access to the labor market, and the large gaps
in wages and working conditions between women and men are also reasons behind the declining female labor force participation in Indian labor market (Pande & Moore, 2015).

In 2015-2016, women comprised 24.8% of all rural workers, down from 31.8% in 1972-73. In 2015-16, women comprised 14.7% of all urban workers, a small increase from 13.4% in 1972-73 (The World Bank, 2015). Additionally, 13.4% of Indian working women have a regular salaried job compared to 21.2% of working men (aged 15–59). Indian women labor earns 56% of what their male colleagues earn for performing the same work (The World Bank, 2015).

Coupled with the decreasing rate of women’s workforce participation, the concerns for the decreasing or lack of women empowerment within the Indian workforce has increased. Over the past two decades, discourse about and attention to the concept of women empowerment has steadily increased within the international human development literature. Women’s empowerment is deemed particularly important from the social justice and equality perspectives as well as a necessary means to achieve economic development goals, such as poverty reduction and increase in, nutrition, health, and education in developing countries (Quisumbing & Kumar, 2011; Smith et. al., 2003).

Although women empowerment is intrinsically experienced by individuals, existing indices of empowerment are typically measured at the aggregate country level (Alkire, Meinzen-Dick, Peterman, Quisumbing, & Seymour, 2012). A variety of indices, such as the Gender Gap Index (Hausmann, Tyson, & Zahidi, 2011), the Gender Development Index (GDI), and the Gender Inequality Index (GII), are reported by the United Nations Development Programme (UNDP) Human Development Reports and cover gender inequalities in a broad set of domains. However, they do not measure women empowerment directly. For example, in the case of GDI, the wage data were largely imputed (UNDP, Human development report 2010, 2010).
Background History of Women Empowerment Indices

Human development emerged as an important development goal in the United Nations mission in the 1990s (Hirway & Mahadevia, 1996). Though numerous concepts and indices were developed to measure the human development and welfare after the 1995 UN summit, some of the concepts have roots in 1970s and 1980s when the concepts of level of living, living standards, state of welfare index, quality of life and physical quality of life index were developed (Drewnowski, 1974; Altimir & Sourrouille, 1980). The level of living and living standards referred to levels of satisfaction of the needs of a population, while state of welfare index measured the level of welfare of a population.

In an effort to chart the progress of broad indicators of well-being and human development, the United Nations Development Program (UNDP) attempted to put forward a standardized human development measure in its first human development report, the human development index (HDI) (UNDP, 1990). In its human development report, UNDP constructed the HDI of a country as a measure of its human development based on life expectancy, adult literacy, and purchasing power adjusted to GDP per capita. The biggest contribution of the human development reports has been to carve a place of prominence for the concept of human development in intellectual discourse and, to a lesser extent, in international policy discussions. Ranking countries based on HDI, UNDP emphasized that development is much more than just the expansion of income and wealth’ and defined human development as ‘the process of enlarging people’s choices’ (UNDP, 1990, p. 10).

HDI did come under much scrutiny and criticism, however. Some of its criticisms were related to the idea of measuring human development by a conceptually limited composite index, some regarded it as being limited in measuring human development by the quality and limitation...
of data (Murray, 1993; Srinivasan, 1994), while others have been critical of the technical properties of this index (McGillivray, 1991; McGillivray & White, 1993; Trabold-Nubler, 1991; Dossel & Gounder, 1994; and Gormely, 1995). The disparity between the HDI and income measures of progress in many countries has powerfully demonstrated that income may be a poor indicator of well-being in some contexts.

The United Nations Development Program published a path breaking Human Development Report (HDR) focusing on gender (UNDP, 1995). That report presented the Gender-related Development Index (GDI) and the Gender Empowerment Measure (GEM). These were the first composite indices designed to reflect gender disparities in basic capabilities at the global level. The GDI takes into account gender inequality in its overall assessment of aggregate human development in a country. GDI is simply a special case of the HDI, where the gender gaps are adjusted to penalize countries for the existing gender inequality between males and females. The GEM measures whether women and men hold equal power in the political and economic sphere (UNDP, 1995). The GEM seeks to measure relative female representation in economic and political power. It thus attempts to measure not achievement in well-being, but equity in agency.

UNDP in its 2010 Human Development Report introduced a new measure, The Gender Inequality Index, in an attempt to overcome some of the problems identified in the limitations of GDI and GEM (UNDP, 2010). The Gender Inequality Index (GII) was designed to capture women’s disadvantage in three areas; empowerment, economic activity, and reproductive health. The UNDP’s GII shows the loss in human development due to inequality between female and male achievements in these dimensions. The GII combines the concepts that were measured using separate empowerment and development indices. However, the combination of indicators
to compare the achievements of women against men, together with indicators that are only defined for women, specifically, in the area of the reproductive health, obscures its interpretation and penalizes the performance of low income countries (Permanyer, 2013).

To address the weakness of the GDI and GEM, the World Economic Forum also introduced the Gender Gap Index (GGI) in 2006 (WEF, 2006). The GGI measures the five dimensions of gender inequality: (a) economic participation, (b) economic opportunity, (c) political empowerment, (d) educational attainment, and (e) health and wellbeing. The index is calculated by converting data into male/female ratios, which are then truncated according to an “equality benchmark”. The Organization for Economic Co-operation and Development (OECD) in 2009 also proposed a Social Institutions and Gender Index (SIGI), a cross-country measure of discrimination against women in social institutions (OECD, 2009). The SIGI is built around the overarching concept of social institutions, and therefore, is focused not on gendered outcomes but rather on gendered institutions and processes.

Using these indices, several studies have been conducted to measure women empowerment in different sectors and or countries. Using the gender empowerment measure, studies were conducted to evaluate political achievement of women in developed and developing countries (Ismail, Rasdi, & Jamal, 2011); to understand international development (Malhotra, Schuler, & Boender, 2012); and to calculate global gender gap (Lopez-Claros & Zahidi, 2005). All the above indices, report at the aggregate data and hence cannot be decomposed by age, region, or other social groups (Alkire et. al., 2012).

As a result, WEAI was developed to measure the empowerment, agency, and inclusion of women specifically in the agriculture sector in 2013 (USAID, 2013). The Index is a significant innovation in its field as it aims to increase understanding of the connections between women’s
empowerment, food security, and agricultural growth. The WEAI is a composite measurement tool that indicates women’s control over critical parts of their lives in the household, community, and economy (IFPRI, 2013). It allows identifying women who are dis- or less-empowered and understand how to increase women’s autonomy and decision making power in key domains. The WEAI is also a useful tool for tracking progress toward gender equality, which is one of the United Nation’s Millennium Development Goals.

Particularly, WEAI does not report aggregate data and also does not include variables such as education, income and wealth, which are often thought to be proxies for empowerment. This allows the index to see starkly how empowerment in agriculture relates to achievements (Alkire & Foster, 2011a). The WEAI has also been used to conduct a cross country analysis to measure progress towards empowerment for women in agriculture sector for under developed countries, such as Bangladesh, Cambodia, Ghana, Haiti, Honduras, Kenya, Liberia, Malawi, Nepal, Rwanda, Tajikistan, Uganda, and Zambia (Malapit et al., 2014). However, this newly developed WEAI has mostly applied to women in agricultural households, and has not been used for women laborers’ empowerment in the non-farming households, such as the apparel manufacturing industry.

**Purpose of the Study**

With the gap in the women labor literature within the Indian apparel industry context, this research aims to develop women empowerment index in the apparel industry. Twenty-nine % of the world population are employed by the manufacturing Industry and is the second largest employer after agriculture (The World Bank, 2011). In India, 22% of the population are employed by the manufacturing industry, and 7 million of them employed in the textile and apparel industry. The textile and apparel industry is the second largest provider of employment
in the India (AEPC, 2016). The differences in the labor activities between the agriculture and manufacturing industry leads to different household activities and warrants the need for a indices to measure empowerment that women in the manufacturing industry experience. As WEAI measures the level of empowerment achievements of women in agricultural households, a new index is necessary to measure the empowerment of those in manufacturing, specifically the Indian apparel industry given that the apparel industry is the second largest employer of women in India. Particularly, by assessing different domains of women empowerment index in India where 29.5% of household are currently below the poverty line (Planning Commission, 2015), the study intends to investigate the relationships among the different indicators of production, resources, income, leadership and workload of women empowerment in the Indian apparel industry, all of which are critical factors for women empowerment.

**Significance of the Study**

Grounded in the Alkire-Foster methodology, the research findings, first, were expected to identify who, within the apparel manufacturing industry in India, are (dis)empowered by considering the range of deprivations they enjoy or suffer and the dimensions in which they are most (dis)empowered. This is one of the first of its kinds that measure women empowerment levels quantitatively in the Indian apparel manufacturing sector where many young women today are employed and earn wages from. As much as WEAI is important for assessing women empowerment in the agricultural sector, similar effort is necessary for women in the apparel manufacturing sector from which many women start and develop their career.

Specifically, the findings would show specific domains that are key or vulnerable for Indian apparel women workers’ empowerment. For example, the findings were expected to provide the nature of the relationship between control over income and the workload and, in turn,
its relationship to Indian apparel women empowerment. Given that apparel manufacturing workers are getting paid on salaries with pre-determined work schedules, the ways they receive and control income and they spend their non-working time are starkly different from the women in the agricultural sector. These differences were then expected to affect overall women empowerment differently from women in agriculture. Therefore, the study findings were to give us a better understanding of Indian apparel workers’ time allocations and control over income due to the nature of their employment at the manufacturing sector.

Third, the research findings would improve an understanding of the labor force within the Indian apparel industry. Knowing how empowered/disempowered the women labor are in the Indian apparel industry, the future managers and entrepreneurs could help apparel women labors be more empowered. The study findings also can help shape apparel-related curricula to provide relevant knowledge and skill sets about different indicators that impact women empowerment so that graduates can be are more aware about labor issues and women empowerment, specifically key domains that impacts empowerment. Finally, supply chain members could utilize these findings to make appropriate strategies for improving relationships with the Indian apparel industry to cope with one of the Millennium Development Goals-Gender equality.
Definitions of Key Terms

The definitions for key terms used throughout this text are provided below:

**Empowerment**
Empowerment refers to the expansion of people’s ability to make strategic life choices in a context where this ability was previously denied to him (Kabeer, 1999).

**Women Empowerment**
Women's empowerment is defined through the following five components: women's sense of self-worth; their right to have and to determine choices; their right to have access to opportunities and resources; their right to have the power to control their own lives, both within and outside the home; and their ability to influence the direction of social change to create a more just social and economic order, nationally and internationally (United Nations Population Information Network, 1990)

**Gender Parity Index**
Gender Parity Index is relative inequality measure that reflects the inequality between the primary adult male and female in each dual-adult household. The GPI shows the percentage of women who achieve equality with their male counterparts (Alkire, et al., 2013)

**FLLP**
Female Labor force participation (FLLP) is the proportion of the female population, ages 15 and older that is economically active among all people who supply labor for the production of goods and services during a specified
period (The World Bank, Labor force participation rate, 2016).

Employment Employment is defined as an agreement between an employer and an employee that the employee will provide certain services on the job, and in the employer's designated workplace, to facilitate the accomplishment of the employer organization’s goals and mission, in return for compensation. The agreement can be verbal, implied, or an official employment contract (Department of Labor, 2008).

Production The production dimension is defined as the decisions over non-agricultural production, and is referred to sole or joint decision making over salaried employment, cash-crop farming, livestock, and fisheries as well as autonomy in non-agricultural production (Sraboni, Quisumbing, & Ahmed, 2013).

Resources The resource dimension is defined as the ownership, access to, and decision making power over productive resources such as land, livestock, agricultural equipment, consumer durables, and credit (Sraboni, Quisumbing, & Ahmed, 2013).

Income The income dimension is defined as the sole or joint control over the use of income and expenditures (Sraboni, Quisumbing, & Ahmed, 2013).
<table>
<thead>
<tr>
<th>Dimension</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership</td>
<td>The leadership dimension is defined as the leadership in the community, measured by membership in economic or social groups and comfort in speaking in public (Sraboni, Quisumbing, &amp; Ahmed, 2013)</td>
</tr>
<tr>
<td>Time</td>
<td>The time dimension is defined as the allocation of time to productive and domestic tasks and satisfaction with the available time for leisure activities (Sraboni, Quisumbing, &amp; Ahmed, 2013).</td>
</tr>
</tbody>
</table>
Guiding Paradigms and Research Assumptions

Understanding phenomena and making sense of reality is the critical work of researchers. Since reality appears complex, dynamic, unique, and mostly obscure, guiding paradigms and assumptions are important for researchers to employ in order to explore and interpret reality (Jaccard & Jacoby, 2010). Two guiding paradigms used in this research are (a) structuralism and (b) critical realism.

The first guiding paradigm that underlies this research is that of structuralism, which focuses on discovering how people think rather than what people think (Jaccard & Jacoby, 2010). The researcher assumes that under the surface structure of phenomena, a deeper underlying structure can be found that represents a set of organizing principles (Jaccard & Jacoby, 2010). From the structuralist perspective, the potential role of both conscious and unconscious factors should be considered and matters should be thought of in binary or dialectical terms, focusing on opposites and contrasts (Jaccard & Jacoby, 2010). This study aims to discover the scale of empowerment among Indian apparel labor and the indicators that influence women empowerment. By following the first guiding paradigm, it is assumed that there will be an underlying structure to assist in understanding how empowerment will be affected by the different domains.

The second guiding paradigm of this study is critical realism. From this standpoint, reality is indeed seen through human conceptions of it. The empirical world reverts back to support or reject human conceptions (Jaccard & Jacoby, 2010). Researchers following critical realism assume that reality exists and they try to know about reality through questions and data collection (Jaccard & Jacoby, 2010). In this study, a few research questions are proposed, and
data were collected to provide answer to these questions. Through this approach, the research investigated what is happening in the present society (Jaccard & Jacoby, 2010).

**Organization of the Study**

This dissertation is divided into five chapters. Chapter 1 presents background of the study, purpose of the study, and significance of the study, as well as key terms, guiding paradigms and research assumptions, research context, and organization of the study. Chapter 2 provides a literature review of the theoretical framework for the study, and new women empowerment index for apparel labor. Research gaps and research questions are proposed along with the study model. Chapter 3 presents the research methods, including the research design and survey development, sample data collection procedures, and data analysis techniques. Chapter 4 details the results of data collection, including the demographic characteristics of the study’s sample, scale reliabilities, and finally, factor analysis. In conclusion, Chapter 5 summarizes the study with discussions of the major findings, contributions and implications, along with limitations and future research opportunities.
CHAPTER II: LITERATURE REVIEW

The literature review section includes the following: (a) Theoretical frameworks for study; (b) Components of Women Empowerment in Agriculture; (c) Women Empowerment Index in Apparel Industry; and (e) Research Questions summary.

THEORETICAL FRAMEWORK OF THE STUDY: WOMEN EMPOWERMENT IN AGRICULTURE INDUSTRY (WEAI)

Definition of WEAI

The Women’s Empowerment in Agriculture Index (WEAI) considers a multidimensional empowerment profile for each man and woman, reflecting both individuals’ overlapping achievements in different domains (Alkire, et al., 2013; Sraboni, Malapit, Quisumbing, & Ahmed, 2014). At the same time, it can also be broken down by subnational region, by age, by social group, as well as by each indicator (Alkire, et al., 2013). WEAI is intended to provide a simple, intuitive, and visible headline figure that can be compared across places and across times.

The WEAI is a survey-based index designed to measure the empowerment agency in the agricultural sector. The WEAI was initially developed as a tool to monitor women’s empowerment created from the U.S. government’s Feed the Future Initiative, which commissioned the development of WEAI. Particularly, Feed the Future is the United States Government’s global hunger and food security initiative, which supports country-driven
approaches to address the root causes of hunger and poverty, and forge long-term solutions to chronic food insecurity and under nutrition (IFPRI, 2015). The focus on inclusive agricultural growth within the Feed the Future Initiative was one of the primary reasons for the development of the WEAI (USAID, 2013).

The WEAI can be adapted to measure empowerment of women in rural areas more generally, whether they are farmers, agricultural or non-agricultural wage workers, or engaged in non-farm businesses (Alkire, et al., 2013). With suitable modifications to the indicators of production and resources in the agricultural setting, the five dimensions can be used to measure the level of empowerment of rural women, regardless of occupation (Sraboni, et al., 2013). The WEAI or adaptations of it can also be used more generally to assess the state of women empowerment and gender parity in agriculture (or in other domains), to identify key areas in which women empowerment needs to be strengthened, and to track progress over time (Malapit & Quisumbing, 2015).

WEAI has been developed using the Alkire Foster (AF) (2007) method, a way of measuring multidimensional poverty developed by Oxford Poverty & Human Development Initiative (OPHI). The AF methodology is built upon the Foster-Greer-Thorbecke (FGT) poverty measure construct (Foster, Greer, & Thorbecke, 1984), and involves counting the different types of deprivation that individuals experience at the same time, such as lack of education or employment, and poor health or living standards. These deprivation profiles are analyzed to identify who is poor, and then used to construct a multidimensional index of poverty (MPI).

**Two components of WEAI**

WEAI is an aggregate index that can be broken down in many ways. It is reported at the country or regional level, based on individual-level data collected by interviewing men and
women within the same households. In this light, the WEAI is used by policymakers, development organizations, and academics to seek the information on women’s empowerment (Alkire et al. 2012).

The WEAI is composed of two subindexes: one measures 5DE for women, and the other measures gender parity in empowerment within the household (GPI). The weights of the 5DE and GPI subindexes are 80% and 20%, respectively. The total WEAI score is the weighted sum of the country- or regional-level 5DE and GPI. Improvements in either 5DE or the GPI will increase the WEAI.

\[
\text{WEAI} = 0.8(\text{5DE}) + 0.2(\text{GPI})
\]

Eqn (1)

Next section, first discusses the details of each domain of 5DE and the indicators, followed by GPI.

**First Component of WEAI: 5DE**

The five domains of WEAI are built on recent research to develop indicators of agency and empowerment (for example, Alsop, Bertelsen, & Holland, 2006; Ibrahim & Alkire, 2007; Narayan, 2005; Narayan, Pritchett, & Kapoor, 2009) that propose domain-specific measures of empowerment obtained using individual or household surveys, based on the Alkire–Foster methodology (Alkire & Foster, 2011a; Alkire & Foster, 2011b; Alkire & Santos, 2011).

**Alkire – Foster Methodology**

Alkire & Foster’s (2007) methodology includes two steps: (a) an identification method \( (P_k) \) that identifies ‘who is poor’ by considering the range of deprivations they suffer, and (b) an aggregation method that generates an intuitive set of poverty measures \( (M_\alpha) \) that can be broken down to target the poorest people and the dimensions in which they are most deprived. The next section explaining AF method is from
According to AF method, the identification method \( P_k \) identifies who is poor using two cutoffs. The first cutoff determines whether a person is deprived in each dimension. This is called the poverty cutoff and is denoted by \( k \). The poverty cutoff is the minimum deprivation score a person needs to exhibit in order to be identified as poor. The second cutoff calculates the range of dimensions a person must be deprived in, in order to be considered poor. This poverty cutoff is implemented using an identification function \( P_k \), which depends upon each person’s achievement vector \( x_i \), the deprivation cutoff vector \( z \), the weight vector \( w \), and the poverty cutoff \( k \). If the person is poor, the identification function takes on a value of 1; if the person is not poor, the identification function has a value of 0. That is, the identification function is defined as
\[
P_k(x_i; z) = \begin{cases} 
1 & \text{if } c_i > k \\
0 & \text{otherwise}
\end{cases}
\]
In other words, \( P_k \) identifies person \( i \) as poor when his or her deprivation score is at least \( k \); if the deprivation score falls below the cutoff \( k \), then person \( i \) is not poor according to \( P_k \). Since \( P_k \) is dependent on both the set of within-dimension deprivation cutoffs \( z \) and the across-dimension cutoff \( k \), \( P_k \) is referred to as the dual cutoff method of identification, or sometimes as the ‘intermediary’ method.

According to AF method, the aggregation method \( M_\alpha \) determines the proportion of population who are poor and the average number (or weighted sum) of deprivations that poor people experience. The aggregation step (adjusted headcount ratio) of the AF methodology builds upon the FGT class of unidimensional poverty measures and likewise generates a parametric class of measures. The Adjusted Headcount Ratio, denoted as \( M_0(X; z) \), can also be written as the product of two partial indices. The first partial index \( H \) is the percentage of the population that is poor or the multidimensional headcount ratio or the incidence of poverty. The second index \( A \) is the intensity of poverty. Therefore, it can be said that:
\[
M_0 = H \times A
\]
The headcount ratio or poverty incidence $H = H(X; z)$ is the proportion of the population that is poor. It is defined as $H = q/n$, where $q$ is number of persons identified as poor and $n$ is the sample size, using the dual-cutoff approach.

In turn, poverty intensity ($A$) is the average deprivation score across the poor. The censored deprivation score $c_i(k)$ represents the share of possible deprivations experienced by a poor person $i$. Therefore, the average deprivation score across the poor is given by:

$$A = \frac{1}{n} \sum_{i=1}^{n} c_i(k)$$

Thus, the overall Adjusted Headcount Ratio, denoted as $M_0$, can be expressed as:

$$M_0 = \mu(c(k)) = \frac{1}{n} \times \sum_{i=1}^{n} c_i(k)$$  \hspace{1cm} Eqn (2)

Built from the Alkire-Foster methodology, the United States Agency for International Development (USAID, 2013) developed more compressive empowerment index, a measure of empowerment that shows the number of domains in which women are empowered. In this measure, the USAID defined five domains of empowerment (5DE) which reflected priorities of agricultural programs. These include (a) decisions about agricultural production (production), (b) access to and decision making power about productive resources (resources), (c) control of use of income (income), (d) leadership in the community (leadership), and (e) time allocation (time) (USAID, 2013), and they comprise a total of ten indicators. Each domain is weighted equally, as are each of the indicators within a domain. The 5DE sub-index contributes 80 percent of the weight to the WEAI. Table 1 illustrates the five domains of empowerment.
Table 1: Five Domains of Women Empowerment Index

<table>
<thead>
<tr>
<th>Domains</th>
<th>Indicators</th>
<th>Number of Items</th>
<th>Measurement Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>Input in Productive Decisions</td>
<td>3</td>
<td>1/10</td>
</tr>
<tr>
<td></td>
<td>Autonomy in Production Decisions</td>
<td>4</td>
<td>1/10</td>
</tr>
<tr>
<td></td>
<td>Ownership of Assets</td>
<td>4</td>
<td>1/15</td>
</tr>
<tr>
<td></td>
<td>Access to and Decisions about</td>
<td>4</td>
<td>1/15</td>
</tr>
<tr>
<td>Resource</td>
<td>Credit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Purchase, sale or transfer of Assets</td>
<td>3</td>
<td>1/15</td>
</tr>
<tr>
<td>Income</td>
<td>Control over use of Income</td>
<td>3</td>
<td>1/5</td>
</tr>
<tr>
<td>Leadership</td>
<td>Group Member</td>
<td>2</td>
<td>1/10</td>
</tr>
<tr>
<td></td>
<td>Speaking in Public</td>
<td>2</td>
<td>1/10</td>
</tr>
<tr>
<td>Time</td>
<td>Workload</td>
<td>2</td>
<td>1/10</td>
</tr>
<tr>
<td></td>
<td>Leisure</td>
<td>2</td>
<td>1/10</td>
</tr>
</tbody>
</table>

Source: Alkire (2013)

**Domain 1: Production**

Production domain measures the level of ability to make decisions about agricultural production, in key areas of agricultural production. This domain follows directly from Kabeer’s (1999) or Alsop et al.’s (2006) who defined women empowerment as ability to make choices. This dimension concerns the women’s ability to make decisions over agricultural production, and refers to sole or joint decision-making over food and cash-crop farming, livestock, and fisheries as well as autonomy in agricultural production. The production domain has two indicators.
**Indicator 1.1: Input in production decisions**

The first indicator, input in productive decisions, measures the participation in the decision making in household activities. Input in productive decisions is constructed from answers to the following questions regarding participation in decision making: (1) if an individual participated in the activity, how much input did the individual have in making decisions about (a) food crop farming, (b) cash crop farming, (c) livestock raising, and (d) fish culture and (2) to what extent does the individual feel he or she can make his or her own personal decisions regarding the following aspects of household life if he or she wanted to: (a) which inputs to buy, (b) which types of crops to grow for agricultural production, (c) when to take or who should take crops to market, and (d) whether to engage in livestock raising.

The answer scale for the question regarding input in decisions used by the USAID is 1 = no input, 2 = input into very few decisions, 3 = input into some decisions, 4 = input into most decisions, and 5 = input into all decisions. For each activity, a sub-indicator is created that considers the individual adequate if he or she participates in that activity and has at least input into some decisions related to that activity. That is, if sub-indicator (input_in_decision) >2, then the individual is considered to have adequate role in decision making, otherwise the individual is considered to have inadequate role in household decision making.

The answer scale for questions regarding the extent to which the individual feels he or she can participate in decisions is 1 = not at all, 2 = small extent, 3 = medium extent, and 4 = to a high extent. For each type of decision a sub-indicator is created that considers the respondent adequate if he or she makes the decisions or if the respondent feels that he or she could participate in the decision making to at least a medium extent. That is, if sub-indicator (extent_of_participation) >2, then the individual is considered to have adequate participation in
decision making, otherwise the individual has inadequate extent of participation in decision making.

All of these sub-indicators are then aggregated into the indicator (IPD) “input in productive decisions,” according to the Alkire et al. (2012). Then, the respondent is considered adequate on input in productive decisions if he or she is considered adequate in at least two of the sub-indicators described above. That is, the individual is considered adequate if there are at least two types of decisions in which he or she has some input in decisions, makes the decision, or feels he or she could make it to a medium extent if he or she wanted to.

This input in productive decision corresponds to the aggregated sum of the sub-indicators. That is, input in productive decision indicator (IPD) = total (input_in_decision, extent_of_participation) (Alkire, et. al., 2013). For example, if someone responds to the first question; how much input did the individual have in making decisions about (a) food crop farming as “no input” (b) cash crop farming as “input into very few decisions”, (c) livestock raising as “input into some decisions”, and (d) fish culture as “input into most decisions,” then the sub-indicator (input_in_decision) are 1, 2, 3, 4 for activity [a-d] respectively and the individual has adequacy in activity c and d. In the second question (to what extent does the individual feel he or she can make his or her own personal decisions regarding the following aspects of household life if he or she wanted to), if someone responds (a) which inputs to buy as “not at all”, (b) which types of crops to grow for agricultural production as “small extent”, (c) when to take or who should take crops to market as “medium extent”, and (d) whether to engage in livestock raising as “to a high extent”, then the sub-indicator (extent_of_participation) are 1, 2, 3, 4 for activity [a-d] respectively and the individual has adequacy in activity c and d. Once adequacy and inadequacy cut off has been established, the adequate activity value are converted
to 1 and added; i.e. the input in productive decision indicator (IPD) is \([1+1+1+1]\). The range of the IPD varies between 2 and 8.

**Non Farming Households**

This measurement technique can be applied to non-farming households as many individuals are now engaged in non-farming productive employment. When doing so, some adjustments must be made to be applicable for non-farming households. Typically, non-farming activities can be said to be mining, manufacturing, construction, trading, hotel and transportation and other services. Manufacturing mainly includes food and beverage production; wood processing; furniture production; fur processing and fur products; non-metal mineral products; metal products; textile; and leather products (Hoang, Pham, & Ulunasoglu, 2014). Trading includes vehicle sales, maintenance and repair; retail sales of fuel wholesale and agent and repair of family appliances. Among these, Ruben & Van den Berg (2001) and Janvry & Sadoulet (2001) argued that individuals in non-farming households are typically engaged in the production domain activities which include (a) manufacturing, (b) family business, (c) cash crop farming for household consumption, and (d) livestock raising for household consumption.

For these productive activities required for non-farming households, the same questions could be asked (1) if an individual participated in the above activities, how much input did the individual have in making decisions about, and (2) to what extent does the individual feel he or she can make his or her own personal decisions regarding the above mentioned activities of household life if he or she wanted to.

Therefore, by translating productive activities of farming households to those of non-farming households, the study proposes:
If IPD > 1, respondents in non-farming households have adequate level of input in productive resource decisions

Otherwise respondents in non-farming households have inadequate level of input in productive resource decisions

Indicator 1.2: Autonomy in production

The second indicator of the production domain, autonomy, measures the ability of a person to act on what he or she values, to have his or her own intrinsic motivations prevail over motivations to please others or avoid punishment (Akire, et al, 2012). This indicator probes a person’s own understanding of the situation and enables the respondent to easily explain the different motivations that influence activities (Alkire 2007). The indicator adapts the measure of autonomy developed by several psychologists (Chirkov, Ryan, & Deci, 2011; Ryan & Deci, 2000). The areas of autonomy refer to (1) agricultural production, (2) which inputs to buy, (3) which types of crops to grow, (4) when to take or who would take crops to market, and (5) livestock production (Alkire, et al., 2013).

Autonomy indicator (AI) is constructed from answers to the following: (1) My actions in [activity area] are partly because I will get in trouble with someone if I act differently, (2) Regarding [activity area] I do what I do so others do not think poorly of me, and (3) Regarding [activity area] I do what I do because I personally think it is the right thing to do. The activity areas refer to [A] agricultural production, [B] which inputs to buy, [C] which types of crops to grow, [D] when to take or who should take crops to market, and [E] livestock production. The answer scale for these questions is 1 = never true, 2 = not very true, 3 = somewhat true, and 4 = always true.
Each of the three questions mentioned above is aimed at capturing different kinds of motivation: external (coerced), introjected (trying to please), and identified (own values), respectively (Ryan & Deci, 2000). External motivations occur when one’s action is effectively coerced. Introjected motivations are those in which the respondent acts to please others or to avoid blame, regardless of whether or not he or she personally values this particular course of action. Identified motivations occur when a person’s actions are shaped based on his or her own values (Chirkov, Ryan, & Deci, 2011). Because motivations are often mixed in real life, people act in part to please others as well as based on own personal convictions (Alkire, 2013). The autonomy in production enables the respondent to articulate the extent to which his or her actions are shaped by all three motivations. If the motivation related to the person’s own values are relatively stronger than the others, then the person is thought to have adequacy in autonomy (Ryan & Deci, 2000).

This autonomy corresponds to the weighted sum of the different types of regulations’ subscales. That is autonomy indicator (AI) = \((-2 \times \text{answer scale to question 1}) - \text{answer scale to question 2} + (3 \times \text{answer scale to question 3})\) (Chirkov, Ryan, & Deci, 2011; Ryan and Deci 2000). For example, if someone responds to the first question (my actions in [activity area] are partly because I will get in trouble with someone if I act differently) as sometime true, the second question (regarding [activity area] I do what I do so others don’t think poorly of me) as not very true, and in the third question (regarding [activity area] I do what I do because I personally think it is the right thing to do) as always true, the autonomy indicator is 4 \([-2 \times 3 - 2 + (3 \times 4)]\). The range of the AI varies between –9 and 9.

An individual is considered to have adequate autonomy if his or her actions are relatively more motivated by his or her own values than by coercion or fear of others’ disapproval. So, the
higher the number and the more positive the value are, an individual has more autonomy. This autonomy indicator, unlike decision-making, captures the situation of women living in female-only households, who may indeed be empowered as sole decision makers but whose autonomy may still be deeply constrained by social norms or force of circumstance (Alkire, et al., 2013). It also distinguishes situations in joint households where a “joint” decision may be more or less autonomous, depending on circumstances (Sraboni, et al., 2013).

**Non Farming Households**

When looking in to the non-farming sector, the different non-farm activities are categorized into (i) services including all types of employment in public and private sector institutions, (ii) business enterprises, such as shop keeping, commission agents, any type of trader, contractor services (iii) non-farm labor comprising different types of mechanics, daily labor in rural areas, transport operations, construction labor (Iqbal, Ping, & Ahmed, 2015). Therefore, the different aspects of the non-farm households [A] getting inputs regarding wage-earning manufacturing activities, [B] types of employment to choose for non-farming job, [C] types of small business, [D] types of daily labor jobs, [E] types of cash crops to grow [F] livestock raising (Lanjouw & Shariff, 2004; Yunez-Naude & Taylor, 2001; Reardon, Taylor, Stamoulis, Lanjouw, & Balisacan, 2000).

The questions to measure the degree of the respondents’ autonomy in the non-farming households can then be translated into the following questions: (1) My actions in [activity area] are partly because I will get in trouble with someone if I act differently, (2) Regarding [activity area] I do what I do so others don’t think poorly of me, and (3) Regarding [activity area] I do what I do because I personally think it is the right thing to do for the five different areas (A-E). Through the results, a woman could be considered to have autonomy in production decisions in
the different non-farm household activities, if she has an autonomy indicator value of more than zero. Therefore the study proposes:

If $AI \geq 1$, a woman in non-farming household has autonomy in the productive decisions in the different household activities,

Otherwise a woman in non-farming household is considered to not have autonomy in the productive decisions in the different household activities-------------------Eqn(4)

**Domain 2: Resources**

This dimension concerns ownership of, access to, and decision making power about productive resources such as land, livestock, agricultural equipment, consumer durables, and credit (Alkire, 2013). The access to and decision making power about productive resources reflects control over assets that enable one to act on those decisions (Alkire, et al., 2013). A woman may decide to plant trees, but if she does not have rights to the land or credit to purchase inputs, she may not be able to do so. Thus, the resource domain combines both whether the woman can potentially make decisions over the asset—because her household possesses it—and whether in fact she has the agency to use it (IFRI, 2013).

Three indicators comprise in this domain: (1) ownership of assets and lands; (2) decisions regarding the purchase, sale, or transfer of land and assets; and (3) access to and decisions about credit (Alkire, et al., 2013).

**Indicator 2.1: Ownership of assets**

The ownership indicator examines whether an individual has sole or joint ownership of land and assets, based on a comprehensive list of assets (including agricultural land, large and small livestock, fish ponds, farm equipment, house, large and small household durables, cell
phone, nonagricultural land, and means of transportation). A person is considered adequate in this area if he or she reports having sole or joint ownership, conditional on the household’s ownership of those assets. Furthermore, for the individual to be considered adequate in this domain, ownership cannot be limited to minor assets only, such as poultry, non-mechanized equipment, or small consumer durables.

First, for each type of major asset, an indicator is created to reflect if someone in the household reports owning that type of asset. Then, these indicators were summed across assets, creating the indicator of household ownership, which measures the number of assets that the household owns across all asset types. Second, for each type of asset, additional indicator of an individual’s ownership is created, which equals 1 if the individual, alone or jointly, owns the majority of that type of asset. That is the total number of types of assets household owns and the number of types of agricultural assets household owns are calculated.

The asset-specific indicators are aggregated into the indicator of the respondent’s ownership of assets. According to this indicator, an individual is adequate on ownership if he or she owns at least one asset, as long as it is not all minor assets. The individuals who live in households that do not own any type of major asset are considered inadequate on ownership.

This ownership of assets corresponds to the aggregated sum of the indicators. That is ownership of asset indicator \( \text{OWN} = \text{total} (\text{household} \text{ asset} \text{ own}, \text{agricultural} \text{ asset} \text{ own}) \) (Alkire, et. al., 2013). For example, if someone responds to the first question; who would you say owns most of the (a) agricultural land as “self” (b) large livestock as “partner/spouse”, (c) small livestock as “self and partner jointly”, (d) fish pond or fishing equipment as “other household member”, (e) non-mechanized farm equipment as “partner/spouse and other household member”, and (f) mechanized farm equipment as “self and other outside people” then the sub-indicator.
(agricultural_asset_own) are 1, 2, 3, 4, 5, 6 for productive capital [a-f] respectively, and the individual who indicated positive in a, c, and f productive capital are considered to have adequate resource ownership.

In the second question; who would you say owns most of the (a) house as “self” (b) large consumer durables as “partner/spouse”, (c) small consumer durables as “self and partner jointly”, (d) cell phone “other household member”, (e) other land not used for agricultural purposes as “partner/spouse and other household member”, and (f) means of transportation as “self and other outside people” then the sub-indicator (household_asset_own) are 1, 2, 3, 4, 5, 6 for productive capital [a-f] respectively and the individual has adequacy in a, c, and f productive capital. Once adequacy and inadequacy cut off has been established, the adequate activity value are converted to 1 and added; i.e. ownership of assets (OWN) is [1+1+1+1+1+1]. The range of the OWN varies between 2 and 14.

**Non Farming Households**

This ownership of asset can be applicable for non-farming households as many individuals in the non-farming households possess the similar assets. However, in non-farming households, household assets are more prevalent than agricultural assets (FAO, 2014). The major household assets for the non-farm households are therefore considered as (a) house (b) large consumer durables (c) small consumer durables (d) cell phone (e) other land not used for agricultural purposes and (f) means of transportation (Alkire, 2013). As the non farm households are also based in rural areas, it can be assumed that the rural non-farm households would also have similar agriculture assets as those of farming households. Hence, the agricultural assets considered are (a) agricultural land, (b) large and small livestock, (c) fish ponds, (d) farm equipment (Banerjee & Duflo, 2007).
Therefore, by translating ownership of assets in farming households to those of non-farming households, the study proposes:

If OWN > 1, respondents in non-farming households have adequate access to ownership of major household assets

Otherwise respondents in non-farming households have inadequate access to ownership of assets  

Eqn (5)

**Indicator 2.2: Purchase, sale, or transfer of assets**

The second indicator, defined with similar assets, asks who makes decisions regarding the purchase, sale, or transfer of land and assets (Alkire, et al., 2012). This recognizes that in many societies, full ownership of assets may not apply, but holding other bundles of rights—especially rights of control over purchase and disposal of assets—can also be empowering (Alkire, et al., 2013). Therefore it is asked, “Who is the person who can decide regarding the purchase, sale, or transfer of land and assets?” As in the ownership indicator, a person has adequacy in this area if the household owns any of those assets and if he or she participates in decisions to buy, sell, or transfer the asset, conditional on the household’s owning it. Although the ownership indicator covers all types of assets, this indicator refers only to agricultural productive assets, namely, agricultural land; large livestock; small livestock; chickens, ducks, turkeys, and pigeons; fish ponds or fishing equipment; non-mechanized farm equipment; and mechanized farm equipment (Alkire, et al., 2013).

First, for each type of right (sell, give, rent, and buy) and asset, an indicator (agricultural_asset_ownership) is created that equals 1 if the respondent has, alone or jointly, that right over that type of asset; otherwise the indicator is 0. Second, for each type of agricultural
asset the types of rights are aggregated into an indicator (agricultural_asset_right) of whether the individual has those rights over that asset. This indicator assumes the value 1 if the respondent has, alone or jointly, at least one of the rights considered—to sell, to give, to rent, or to buy—over that type of asset. Third, these indicators of rights are aggregated across types of assets, generating the indicator “purchase, sale, or transfer of assets.” This indicator classifies the individual as adequate if he or she has at least one type of right over at least one type of agricultural asset. Individuals who live in households that do not own any type of agricultural asset are considered inadequate and hence are assigned the value 0 for this indicator.

This purchase, sale, transfer of asset corresponds to the aggregated sum of the indicators. That is purchase, sale, transfer indicator (PST) = total (agricultural_asset_ownership, agricultural_asset_right) (Alkire, et. al., 2013). For example, if someone responds to the first question; if someone responds to the first question; who would you say owns most of the (a) agricultural land as “self” (b) large livestock as “partner/spouse”, (c) small livestock as “self and partner jointly”, (d) fish pond or fishing equipment as “other household member”, (e) non-mechanized farm equipment as “partner/spouse and other household member”, and (f) mechanized farm equipment as “self and other outside people” then the sub-indicator (agricultural_asset_ownership) are 1, 2, 3, 4, 5, 6 for productive capital [a-f] respectively and the individual has adequacy in a, c, and f productive capital.

In the second question (“Who is the person who can decide regarding the purchase, sale, or transfer of land and assets?”) if someone responds (a) agricultural land as “self” (b) large livestock as “partner/spouse”, (c) small livestock as “self and partner jointly”, (d) fish pond or fishing equipment as “other household member”, (e) non-mechanized farm equipment as “partner/spouse and other household member”, and (f) mechanized farm equipment as “self and
other outside people” then the sub-indicator (agricultural_asset_ownership) are 1, 2, 3, 4, 5, 6 for productive capital [a-f] respectively and the individual has adequacy in a, c, and f productive capital. Once adequacy and inadequacy cut off has been established, the adequate activity value are converted to 1 and added; i.e. purchase, sell, transfer indicator (PST) is [1+1+1+1+1]. The range of the PST varies between 0 and 12.

**Non Farming Households**

For non-farming households however, the purchase, sell, transfer would be more appropriate for households assets than agricultural assets. Winters, et al. (2009) found that non-agricultural assets were higher than agricultural assets for landless households in Bangladesh, Nepal, Pakistan, Ghana, Indonesia, Guatemala, Albania, Equador, Bulgaria and Panama. Therefore for the purchase, sell, transfer indicator, non-agricultural or household assets would be the focus of investigation. Fletschner, (2009) also found that women in most cases are solely responsible for, decisions regarding the purchasing, and sale of the family’s smaller animals and the income these animals generate. The study also indicated that, in general, women are much less likely to be involved in financial decisions regarding the family’s land, larger animals, market-oriented crops.

For purchase, sell, transfer of household assets in non-farming households, the same questions that would be asked are (1) who would you say owns most of the [household] assets, and (2) Who is the person who can decide regarding the purchase, sale, or transfer of land and assets? Therefore, by translating purchase, sell, transfer indicator of farming households to those of non-farming households, the study proposes:

If PST > 0, respondents in non-farming households have adequate access to purchase, sale or transfer of assets
Otherwise respondents in non-farming households have adequate access to purchase, sale or transfer of assets

\[ \text{Eqn}(6) \]

**Indicator 2.3: Access to and decisions about credit**

The third indicator examines decision making about whether to obtain credit and how to use credit from various sources (non-governmental organizations, formal and informal lenders, friends or relatives, rotating savings, and credit associations) (Alkire, et al., 2012). To have adequacy on this indicator, a person must belong to a household that has access to credit (even if they did not use credit), and if the household used a source of credit, the person participated in at least one decision about it (USAID, 2013).

First, the indicator “access to credit” assumes the value of 1 if the respondent lives in a household that has taken a loan in the past 12 months from at least one of the potential sources of credit. Second, for each potential source of credit, types of decisions are aggregated into an indicator that assumes the value 1 if the respondent makes, alone or jointly, at least one of the decisions considered—borrowing or how to use the credit—for that particular source of credit. Finally, these indicators are aggregated across potential sources of credit, generating the indicator “access to and decisions about credit.” The respondent is classified as adequate on credit if he or she makes at least one decision relative to credit from at least one source of credit. Individuals who live in households that do not use any source of credit are considered inadequate on access to credit and hence are assigned the value 0 for this indicator.

This access to credit corresponds to the decision making and control over credit. That is access to credit (ATC) = Sum (loan_borrow, decision_loan/borrow) (Alkire, et al., 2013). For example, if someone responds to the first question; has anyone in the household taken any loans or borrowed cash / in kind from (a) non government organization as “yes, cash” (b) informal
lender as “yes, in kind”, (c) formal lender (bank/financial institutions) as “yes, cash and in kind”, (d) friends or relatives as “no”, and (e) micro finance groups as “don’t know” in the last 12 months, then the sub-indicator (loan_borrow) are 1, 2, 3, 4, 5 for lending sources [a-e] respectively and the individual has adequacy in lending sources [a-c].

In the second question (who made the decision to borrow from [a-c]) if someone responds (a) Self (b) Partner/Spouse (c) Self and partner/spouse jointly (d) Other household member (e) Self and other household member(s) (f) Partner/Spouse and other household member(s) (g) Someone (or group of people) outside the household (h) Self and other outside people (i) Partner/Spouse and other outside people (j) Self, partner/spouse and other outside people then the sub-indicator (decision_loan/borrow) will have adequacy only if the decision is made by a, c, e, h and j. Once adequacy and inadequacy cut off has been established, the adequate activity value are converted to 1 and added; i.e. the access to credit (ATC) is [1+1+1+1+1]. The range of the ATC varies between 0 and 10.

The lending sources for farming and non-farming households tend to remain the same as the lending sources depend on the economy of the country and not on the household structure. Non-government organizations, informal lenders and microfinance groups, are a very common source for borrowing or loaning cash / in kind among rural households (Banerjee & Duflo, 2007; Armendariz de Aghion & Morduch, 2000). However, cooperative banks and rural financial institutions are gaining popularity among rural and semi urban households (Reddy, 2006; Burgess & Pande, 2003)

**Non Farming Households**

The set of variables affecting women’s access to credit is quite different from those that impact men’s position in the credit market in non farming households (Fletschner, 2009). Fletschner
(2009) found that in non-farming Paraguay households, women are more likely to be credit constrained than men under equivalent socio-economic conditions and women may not always be able to rely on their husbands to help them overcome the obstacles they face in those markets. The study also shows that women’s access to credit is affected by their control over household resources, their bargaining power, and their husbands’ preferences. Also vast majority of rural credit, savings, lending programs do not take into account women’s legal, social, and economic position in their communities and how it differs from men’s (Fletschner & Kenney, 2014).

Berger (1995) also found that due to difficult access to the formal financial sector, women tend to utilize informal sources of credit such as family, friends, moneylenders, pawnbrokers, and informal rotating schemes.

For the access to credit for non-farming households, the same questions could be asked (1) has anyone in the household taken any loans or borrowed cash / in kind from (a) non-government organization (b) informal lender, (c) formal lender (bank/financial institutions), (d) friends or relatives, and (e) micro finance groups, and (2) who made the decision to borrow.

Even for non-farming household, accessibility to credit could still augment household income periodically. Also, accessibility of credits (e.g., loan to buy refrigerator) is found to improve the quality of life in any type of households. Therefore, by access to credit was still suitable to include in this study. Therefore, the study proposes:

If ACT > 0, respondents in non-farming households have adequate access to credit

Otherwise respondents in non-farming households have inadequate access to credit

---Eqn (7)---
**Domain 3: Income**

The control over income is a key domain for exercising choice, and it reflects whether a person is able to benefit from her or his efforts. This is especially important in agriculture because, often even where women produce crops or livestock, they are marketed by men who then keep most of the income (Alkire, et al., 2013). Tracking this component of the WEAI could help monitor changes in control of income. This dimension concerns sole or joint control over the use of income and expenditures. The single indicator for this dimension measures the degree of input into decisions about the use of income generated from the productive/income-generating activities mentioned above, as well as the extent to which the individual feels he or she can make his or her own personal decisions regarding wage or salary employment (Alkire, et al., 2012).

**Indicator 3: Control over use of income**

Control over use of income is constructed from answers regarding input into decisions about the use of income: (1) if an individual participated in the activity, how much input did the individual have in decisions about the use of income generated from (a) food crop farming, (b) cash crop farming, (c) livestock raising for additional income, and (d) fish culture, and (2) to what extent does the individual feel he or she can make his or her own personal decisions regarding the following aspects of household life if he or she wanted to: (a) his or her wage or salary employment, (b) major household expenditures, and (c) minor household expenditures.

The answer scale for the question regarding input in decisions is: 1 = no input, 2 = input into very few decisions, 3 = input into some decisions, 4 = input into most decisions, and 5 = input into all decisions. For each activity an indicator is created that considers the individual adequate on input in decisions about the use of income if he or she participates in that activity and has at least some input into decisions related to that activity. That is if sub-indicator
The answer scale for the question regarding the extent to which the individual feels he or she can participate in decisions is: 1 = not at all, 2 = small extent, 3 = medium extent, and 4 = to a high extent. For each type of decision an indicator is created that considers the respondent adequate if he or she makes the decisions himself or herself or if the respondent feels that he or she could participate in the decision making at least to a medium extent.

Then, all these sub-indicators are aggregated into the indicator for control over income. The respondent is considered adequate on control over use of income if he or she is considered adequate in at least one of the sub-indicators described above, as long as it is not the sub-indicator for making decisions regarding household minor expenditures. That is if sub-indicator (extent_of_income_decision) >2 then the individual has adequate role in decision making, otherwise the individual is considered to have inadequate role in household decision making.

Control over income corresponds to the aggregated sum of the sub-indicators. That is control over income indicator (COI) = total (input_in_income_decision, extent_of_income_participation) (Alkire, et. al., 2013).

For example, if someone responds to the first question; how much input did the individual have in decisions about the use of income generated from (a) food crop farming as “no input” (b) cash crop farming as “input into very few decisions”, (c) livestock raising as “input into some decisions”, and (d) fish culture as “input into most decisions” then the sub-indicator (input_in_income_decision) are 1, 2, 3, 4 for activity [a-d] respectively and the individual has adequacy in activity c and d. In the second question to what extent does the individual feel he or she can make his or her own personal decisions regarding the following aspects of household life.
if he or she wanted to) if someone responds (a) his or her wage or salary employment as “to a high extent”, (b) major household expenditures as “medium extent”, and (c) minor household expenditures as “small extent”, then the sub-indicator (extent_of_income_participation) are 4, 3, 2 for activity [a-c] respectively and the individual has adequacy in activity a and b. Once adequacy and inadequacy cut off has been established, the adequate activity value are converted to 1 and added; i.e. the input in productive decision indicator (COI) is [1+1+1+1]. The range of the COI varies between 1 and 7.

**Non Farming Households**

In the non-farming households, the common income generating activities are from (i) services which includes all types of employment in public and private sector institutions, (ii) business enterprises like shop keeping, commission agents, any type of trader, contractor services (iii) non-farm labor comprising different types of mechanics, daily labor in rural areas, transport operations, construction labor (Iqbal, Ping, & Ahmed, 2015). Cash crop farming and livestock raising are also found as secondary income diversification method among nonfarm households in rural Africa (Barrett, Reardon, & Webb, 2001). Janvry & Sadoulet (2001) also found that non-farm income accounts for 55% of total household incomes in ejido households in rural Mexico. Reardon, Bordegue, & Escobar (2001) also found that in Latin America, nonfarm wage incomes exceed self-employment incomes, farm wage incomes, and migration incomes. They also found that service-sector rural non farm income far exceeds manufactures rural non farm income.

Same questions to measure the control over respondents’ income in the non-farming households can then be translated into the following questions: (1) if an individual participated in the activity, how much input did the individual have in decisions about the use of income
generated from (a) manufacturing, (b) family business, (c) nonfarm labor (d) cash crop farming, (e) livestock raising, and (2) to what extent does the individual feel he or she can make his or her own personal decisions regarding the following aspects of household life if he or she wanted to: (a) his or her wage or salary employment, (b) major household expenditures, and (c) minor household expenditures. Through the results, an individual could be considered to have control over use of income in the different non-farm household activities, if she has control over income indicator value of more than zero. Therefore the study proposes:

If COI ≥ 2, a woman in non-farming household has control over use of income for the different household activities,

Otherwise a woman in non-farming household is considered to not have the control to use income for different household activities ————Eqn (8)

**Domain 4: Leadership**

The leadership domain captures aspects of inclusion and participation, accountability, and local organizational capacity, which Narayan, (2002) cites as key elements of empowerment. It is measured at the individual level, because even if opportunities exist for women to exercise leadership within the community, an individual may not necessarily be able to take advantage of such opportunities—for example, if family members object to her participation in groups or in political activities.

This dimension concerns with the leadership in the community, measured by the membership in economic or social groups and the degree of comfort in speaking in public (Alkire, et al., 2012). Whether the person is comfortable with speaking up in public consists of responses to questions about the person’s ease in speaking up in public to help decide on
infrastructure (like small wells, roads) to be built, to ensure proper payment of wages for public work or similar programs, and to protest the misbehavior of authorities (Alkire, et al., 2013).

**Indicator 4.1: Group membership**

Recognizing the value of social capital as a resource, this shows whether the person is an active member of at least one group, including (1) agriculture producers’ or marketing groups, (2) water users’ groups, (3) forest users’ groups, (4) credit or microfinance groups; (5) mutual help or insurance groups (including burial societies), (6) trade and business associations, (7) civic or charitable groups, (8) local government groups, (9) religious groups, and (10) other women’s groups. An individual is considered to have adequacy if he/she is part of at least one group. If an individual is not part of any group, he/she is considered to be inadequate group member.

Group membership is deliberately not restricted to formal agriculture-related groups because other types of civic or social groups provide important sources of networks and social capital that are empowering in themselves and may also be an important source of agricultural information or inputs (Meinzen-Dick, Beherman, Pandolfelli, Peterman, & Quisumbing , 2013).

As the group membership is spread across agricultural, non-agricultural and government groups, it can be easily assumed that the same groups would also be applicable for non-farm households. Same questions to measure the group membership (GRP) in the non-farming households can then be translated through the questions: (1) is there a [group] in your community; (2) are you an active member of this [group]. Through the results, an individual from nonfarm household could be considered to have adequacy in group membership, if he/she is active in at least one group. Therefore the study proposes:

If $\text{GRP} \geq 1$, an individual in non-farming household has adequate group membership,
Otherwise an individual in non-farming household has inadequate group membership ----

Indicator 4.2: Speaking in public

The indicator for whether the individual is comfortable speaking up in public is constructed based on responses to questions regarding the individual’s ease in speaking up in public for three reasons (1) to help decide on infrastructure (such as small wells, roads) to be built, (2) to ensure proper payment of wages for public work or other similar programs, and (3) to protest the misbehavior of authorities or elected officials. The answer scale for these questions is 1 = no, not at all comfortable, 2 = yes, but with a great deal of difficulty, 3 = yes, but with a little difficulty, 4 = yes, fairly comfortable, and 5 = yes, very comfortable.

For each of the three reasons, an indicator of the individual’s comfort in speaking for that specific reason was created. The answer 2, “yes, but with a great deal of difficulty”, is the cut-off. So the respondent is considered to be comfortable speaking in public if he or she does not answer no, not at all comfortable. The three reason-specific indicators are aggregated into the indicator “speaking in public.” The respondent is considered adequate in speaking in public if he or she is comfortable speaking in public for at least one of the three reasons listed above.

Speaking in public (SPUB) indicator is also independent of household structure. Hence, this indicator can also be used for nonfarm households without any modifications. However in nonfarm manufacturing jobs labor unions plays an important role in voicing concerns to the management (Devarajan, Ghanem, & Thierfelder, 1997). Women labor activism was also found to be present in labor protests in Indonesia (Silvey, 2003). Therefore to construct whether an individual from nonfarm household is comfortable in speaking in public is based on the responses to questions regarding the individual’s ease in speaking up in public for four reasons.
(1) to help decide on infrastructure (such as small wells, roads) to be built, (2) to ensure proper payment of wages for public work or other similar programs, (3) to protest the misbehavior of authorities or elected officials, and (4) to voice concerns in the industry.

Through the results, an individual from nonfarm household could be considered to have comfortable adequacy in speaking in public, if he/she is comfortable speaking up in public even though with a great deal of difficulty. Therefore the study proposes:

If \( \text{SPUB} \geq 2 \), an individual from non-farming household is adequately comfortable in speaking up in public

Otherwise an individual from non-farming household is not adequately comfortable in speaking up in public

---

**Domain 5: Time**

This dimension concerns the allocation of time to productive and domestic tasks and satisfaction with the available time for leisure activities (Alkire, et al., 2013). The time allocation domain includes two indicators: workload and leisure. The first refers to the allocation of time to productive and domestic tasks; the second captures the individual’s satisfaction with the time available for leisure activities.

**Indicator 5.1: Workload**

The productive and domestic workload is derived from a detailed 24-hour time allocation module based on the Lesotho Time Budget Study (Government of Lesotho, 2003) in which respondents were asked to recall the time spent on primary and secondary activities during the previous 24 hours starting at 4:00 a.m. on the day before the interview. The amount of hours worked is defined as the sum of the time the individual reported spending on work related tasks
as the primary activity plus 50 percent of the time she or he reported spending on work related
tasks as the secondary activity. The definition of work-related tasks includes wage and salary
employment, own business work, farming, construction, shopping/getting service, fishing,
weaving/sewing, textile care, cooking, domestic work, caring for children/adults/elderly,
commuting, and traveling.

The individual is defined as adequate on workload if the number of hours he or she
worked per day was less than the time poverty line of 10.5 hours in the previous 24 hours. This
cut-off was based on a methodology similar to that of Bardasi & Woodon (2006) who used a
lower threshold equal to 1.5 times the median of the total individual working hours distribution
and a higher threshold equal to 2 times the median, which was equivalent to 10.07 hours per day
and 13.4 hours per day for the lower and the higher thresholds, respectively. As the workload
indicator does not differentiate between the work types, and measures the total amount of work,
this concept can also be used for nonfarm work without any modifications.
Therefore the study proposes:

\[
\text{If workload} \leq 10.8 \text{ hours, an individual is considered to have adequate workload}
\]

\[
\text{Otherwise an individual is considered to have inadequate workload} \quad \text{Eqn (11)}
\]

**Indicator 5.2: Leisure**

The last indicator asks whether the individual is subjectively satisfied with his or her
available time for leisure activities, such as visiting neighbors, watching TV, listening to the
radio, seeing movies, or doing sports (Alkire, et al., 2013). Respondents were asked to rank their
level of satisfaction with the time available for leisure activities such as visiting neighbors,
watching TV, listening to the radio, seeing movies, or doing sports from 1 = not satisfied to 10 =
very satisfied. The indicator “leisure time” considers the respondent adequate if he or she ranks
his or her level of satisfaction equal to or higher than 5, which means he or she is indifferent to or satisfied with the time available for leisure. The percentage of women with adequate leisure time is 65.8 in Bangladesh, 83.1 in Guatemala, and 68.3 in Uganda (Alkire, et al., 2014). As this is a subjective question, it reflects respondents’ frames of reference as well as their actual achievements. Women’s time constraints not only are a burden on women themselves but can negatively affect the care and welfare of children and other family members as well (Alkire, et al., 2013).

The leisure time for farm and nonfarm households among husband and wife were found to be a function of the wage rate (Tokle & Huffman, 1991). The leisure activities can be assumed to be similar for farm and nonfarm households as the societal structure is same for both farm and nonfarm households from same countries. An individual from nonfarm household is considered to have adequacy in leisure, if he/she has a satisfaction value of more than 5 in the amount of time spend in leisure. Therefore, the study proposes:

\[
\text{If leisure} \geq 5, \text{ an individual from non-farming household has adequate leisure time}
\]
\[
\text{Otherwise an individual from non-farming household does not have adequate leisure time}
\]

----------------------------------------Eqn (12)

Second Component of WEAI: Gender Parity

Gender Parity Index (GPI)

Gender equality contributes to disempowerment or conversely to empowerment. The importance of gender equality is highlighted prominently in the United Nations’ Millennium Development Goals, commonly accepted as a framework for measuring development progress (UNDP, Human development report 2010, 2010).
It has been well documented that gender inequalities at the societal or aggregate level impose societal costs in forgone growth in per capita incomes (for example, Klasen & Lamanna 2008; World Bank 2011). A number of indexes also measure gender inequality at the societal level (for example, the Global Gender Gap Index of the World Economic Forum [Hausmann, Tyson, & Zahidi 2011], the Gender Inequality Index produced by the United Nations Development Programme as part of the Human Development Report, and the Social Institutions and Gender Index of the Organisation for Economic Co-operation and Development [Branisa, Klasen, & Ziegler 2009]).

A large body of evidence demonstrates that failing to pay attention to intra-household gender inequality has costs for attaining development objectives (Alderman et al. 1995; Alderman et al., 1997; Quisumbing 2003). Studies on child nutritional status (Smith et al. 2003) and child schooling (Quisumbing & Maluccio 2003) use indicators of differences in age, education, and assets at marriage between the husband and wife within the same household as indicators of intra-household bargaining. Husband’s age and educational seniority have also been used to connote male control over women (for example, Cain 1984; Miller 1981, cited in Quisumbing & Hallman 2005). Educational differences can be viewed as a proxy for differences in earning power, which influences bargaining power (Sen, 1989). For example, Smith et al. (2003) base their measure of women’s decision making power relative to their male partners (usually their husbands) on four underlying indicators: whether a woman works for cash, her age at first marriage, the age difference between her and her husband, and the educational difference between her and her husband.

Intra-household inequality has specifically been shown to have costs for agricultural productivity. Udry (1996) has shown, for example, that yields on female-managed agricultural
plots are less than those on male-managed plots within the same household, owing to lower input application on female-managed plots. Research evaluating the long-term impact of agricultural interventions in Bangladesh found that although many development programs have succeeded in increasing women’s assets, in programs that do not deliberately target women, men’s assets also increase and do so faster than women’s assets, resulting in growing gender asset inequality within the same household (Quisumbing & Kumar, 2011).

Thus, gender parity is based on differences in empowerment between the primary male and primary female adults within each household. The GPI is a relative inequality measure that reflects the inequality in 5DE profiles between the primary adult male and female in each dual-adult household (Smith, 2012). In most but not all cases, the primary and secondary male and female are husband and wife; however, men and women can be classified as the primary male and female decision makers regardless of their relationship to each other. By definition, households without a primary adult male and female pair are excluded from this measure, and thus the aggregate WEAI uses the mean value of dual-adult households for the GPI (Smith, 2012). The GPI shows the percentage of women who achieve parity with their male counterparts. In cases of gender disparity, the GPI reflects the relative empowerment gap between the female’s 5DE score and the male’s. The GPI can thus be increased either by increasing the percentage of women who enjoy gender parity or, for those women who are less empowered than the male in their household, by reducing the empowerment gap between the male and female of the same household.

**Computing Gender Parity Index**

For the purpose of constructing the GPI, the score of those whose inadequacy score is less than or equal to the disempowerment cut-off of k is replaced by the value of k, which is 20
percent (Alkire et al., 2012). Note that when \( c_i > k \), then \( c'(k) = c_i \), but if \( c_i \leq k \), then \( c'(k) = k \). Here \( c_i(k) \) is the inadequacy score of the disempowered and \( c'(k) \) for the new censored inadequacy score.

Households are considered to lack parity if the female is disempowered and her censored inadequacy score is higher than the censored inadequacy score of her male counterpart (Alkire et al., 2013). Put differently, a household enjoys parity if the woman is empowered or, if she is not empowered, her adequacy score is greater than or equal to that of the male in her household.

The GPI combines two key pieces of information: (1) the percentage of women who have not yet achieved empowerment or gender parity relative to their male counterparts (within a given population) and (2) the extent of the inequality between those women who lack parity and the men with whom they live.

The first component corresponds to the proportion of gender parity–inadequate households (\( H_{GPI} \)):

\[
H_{GPI} = \frac{h}{m}
\]

where \( h \) is the number of households classified as inadequate in gender parity and \( m \) is the total of dual-adult households in the population.

Formally, the second component is called the average empowerment gap; it is the average percentage gap between the censored inadequacy scores of the women and men living in households that lack gender parity (\( I_{GPI} \)):

\[
I_{GPI} = \frac{1}{h} \sum_{j=1}^{h} \frac{c'_j(k)^W - c'_j(k)^M}{1 - c'_j(k)^M}
\]
where $c'(k)^w$ and $c'(k)^m$ are the censored inadequacy scores of the primary woman and man, respectively, living in household $j$, and $h$ is the number of households that are gender parity inadequate.

The GPI is computed as follows:

$$GPI = 1 - (H_{GPI} \times I_{GPI}) \hfill \text{Eqn (14)}$$

The GPI score can thus be improved by increasing the percentage of women who have gender parity (reducing $H_{GPI}$) or, for those women who are less empowered than men, by reducing the empowerment gap between the male and female of the same household (reducing $I_{GPI}$).

No specific modifications of calculating GPI for WEIAI is necessary as the household composition for agricultural sector and rural manufacturing sector does not change. The GPI measures the gender gap within a household and as the household structure are quite similar for agricultural households and wage earning households (Das et al., 2015), no changes are made to the components for calculating GPI.

**Proposed Women Empowerment Index for the Apparel Industry (WEIAI)**

Following the calculation formula of WEAI, the study proposes a new index to measure the level of women empowerment for the apparel women laborers in India, called Women Empowerment index for the Apparel Industry (WEIAI)

**5DE of WEIAI**

The 5DE convey the percentage of women who are empowered and the intensity of disempowerment. Each person is given a binary score in each of the 10 indicators, reflecting whether she has adequate or inadequate achievements in each indicator. An empowerment score is then generated for each participant, in which the weights of adequacy are summed to create a
score that lies between 0 and 100%. All in all, a woman is defined as empowered in 5DE if she has adequate achievements in four of the five domains or is empowered in some combination of the weighted indicators that reflect 80% total adequacy or more.

After modification of the indicators of the five domains for Women Empowerment in Agriculture Index to fit to apparel women laborer’s households to understand how women employees in the Indian apparel industry gain their women empowerment and which types of factors that impact the Indian women employee’s empowerment. To differentiate this new model from WEAI focusing on women in agricultural sector, this study label this index to be Women Empowerment Index in the Apparel Industry, or WEIAI.

First, the five domains of disempowerment index (M₀) of WEIAI. That is because, to understand how women are disempowered in different contexts, it is useful to break down M₀. A key feature of M₀ is that once the disempowered have been identified, one can decompose M₀ into its component-censored indicators to reveal how people are disempowered—the composition of inadequacies they experience (Alkire, et al, 2013).
<table>
<thead>
<tr>
<th>Domain</th>
<th>Indicator</th>
<th>Indicator Description</th>
<th>Proposed Description</th>
<th>Source</th>
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<tbody>
<tr>
<td>Production</td>
<td>Input in Productive Decisions</td>
<td>Input in making decisions about food crop farming, cash crop farming, livestock raising, fish culture</td>
<td>Input in making decisions about salaried employment, family business, cash crop farming, livestock raising</td>
<td>Janvry &amp; Sadoulet (2001)</td>
</tr>
<tr>
<td></td>
<td>Autonomy in Production</td>
<td>Measures the actions in agricultural production, inputs to buy, crops to grow, take to market, livestock, are because I think it is the right think to do or so that others don’t think poorly of me.</td>
<td>Measures the actions in types of employment, inputs to wage earning activities, daily jobs to chose, small business, livestock, are because I think it is the right think to do or so that others don’t think poorly of me.</td>
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<tr>
<td>Resources</td>
<td>Ownership of Assets</td>
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<td>FAO (2014)</td>
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<tr>
<td></td>
<td>Purchase, Sale or Transfer of assets</td>
<td>Who decides whether to sell, give away, rent/ mortgage, ag land, livestock, farm equipment, fish pond. Who contributes to those decisions</td>
<td>Who decides whether to sell, give away, rent/ mortgage house, consumer durables, non-ag land and transport vehicle. Who contributes to those decisions</td>
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<tr>
<td></td>
<td>Access to and decisions on credit</td>
<td>Who made the decision to borrow and what to do with the money/item borrowed from NGO; Informal lender; Formal lender (bank); Friends or relatives; savings group</td>
<td>Who made the decision to borrow and what to do with the money/item borrowed from NGO; Informal lender; Formal lender (bank); Friends or relatives; savings group</td>
<td>Reddy (2006); Burgess &amp; Pande (2003)</td>
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<tr>
<td>Income</td>
<td>Control over use of income</td>
<td>Measure of control over use of income generated from: Food crop, Cash crop, Livestock, Fish culture, Non-Farm activities</td>
<td>Measure of control over use of income generated from: Salaried Employment, Family Business, Daily Labor jobs, Cash crop, Livestock</td>
<td>Iqbal, Ping, &amp; Ahmed (2015)</td>
</tr>
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<tr>
<td>Group Member</td>
<td></td>
<td>Measure of Membership of any: Agricultural / livestock/ fisheries producer/mkt group; Water; Forest users; Credit or microfinance group; Mutual help or insurance group (including burial societies); trade or business association; Local government; Religious group; Other group</td>
<td>Measure of Membership of any: Trade or business association; Credit or microfinance group; Mutual help or insurance group (including burial societies); Local government; Religious group; Agricultural / livestock/ fisheries producer/mkt group; Water; Forest users; Other group</td>
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<tr>
<td>Speaking in Public</td>
<td></td>
<td>Measure of comfort level for speaking in public regarding local infrastructure issues; public work or other similar programs; to protest misbehavior of authorities or elected officials and to intervene in case of a family dispute</td>
<td>Measure of comfort level for speaking in public regarding local infrastructure, public work or other similar programs; to voice concerns in the industry, to protest misbehavior of authorities or elected officials and to intervene in case of a family dispute</td>
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<tr>
<td>Time</td>
<td>Workload</td>
<td>Measuring the total hours worked in previous 24 hours</td>
<td>Measuring the total hours worked in previous 24 hours</td>
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<td></td>
<td>Leisure</td>
<td>Measuring satisfaction with the available time for leisure activities like visiting neighbors, watching TV, listening to radio, seeing movies or doing sports</td>
<td>Measuring satisfaction with the available time for leisure activities like visiting neighbors, watching TV, listening to radio, seeing movies or doing sports</td>
<td>Tokle &amp; Huffman (1991)</td>
</tr>
</tbody>
</table>
Following the structure of the Adjusted Headcount measure of Alkire and Foster (2011a), \( M_0 \) combines two key pieces of information: (1) the proportion or incidence of individuals (within a given population) whose share of weighted inadequacies is more than \( k \) and (2) the intensity of their inadequacies—the average proportion of (weighted) inadequacies they experience.

Formally, the first component is called the disempowered headcount ratio \( (H_p) \):

\[
H_p = \frac{q}{n}.
\]

Here \( q \) is the number of individuals who are disempowered, and \( n \) is the total population.

The second component is called the intensity (or breadth) of disempowerment \( (A_p) \). It is the average inadequacy score of disempowered individuals and can be expressed as follows:

\[
A_p = \frac{\sum_{i=1}^{n} c_i(k)}{q}
\]

where \( c_i(k) \) is the censored inadequacy score of individual \( i \) and \( q \) is the number of disempowered individuals.

\( M_0 \) is the product of both: \( M_0 = H_p \times A_p \). Finally, 5DE is easily obtained:

\[
5DE = 1 - M_0.
\]

Although 5DE is based on \( M_0 \), it can also be expressed as

\[
5DE = H_e + H_p \times A_e, \quad \text{Eqn (13)}
\]

where \( H_e \) is the empowered headcount ratio, which equals \( (1 - H_p) \); and \( A_e \) is the average adequacy score of disempowered individuals, which equals \( (1 - A_p) \).

The 5DE score can thus be improved by increasing the percentage of empowered women or, for those women who are not yet empowered, by increasing their adequacy scores.

A higher disempowerment cut-off implies a lower number of disempowered individuals and, hence, a higher empowered headcount ratio and a higher 5DE. Given the main purpose of the
WEIAI, tracking change in women’s empowerment, it was important to establish a cut-off that would result in baseline indexes that would allow a reasonable scope for improvement: too high a disempowerment cut-off could result in too few individuals’ being classified as disempowered (and potentially with very little room for improvement); too low a cut-off might suggest that it is too easy to achieve empowerment, resulting in an indicator with very little sensitivity. After exploring the sensitivity of the empowerment classification for different cut-offs, the disempowerment cut-off of 20% will be used in this study. An individual is disempowered if her inadequacy score is greater than 20%. This is the same as saying that an individual is identified as empowered in 5DE if he or she has adequate achievements in four of the five domains, enjoys adequacy in some combination of the weighted indicators that sum to 80% or more, or has an adequacy score of 80 or greater. Considering this, the study proposes the following research question after computing 5DE of all participants:

**Research question 1**: Which domain(s) contribute(s) to the women empowerment distributions in women laborers in the Indian apparel industry, and who each of those domains affect women empowerment? How are these pictures similar to or different from other WEAI results done in other countries’ agricultural sectors?

**Impact of WEIAI**

Based on the review of the literature presented, this research employs the AF methodology to measure the women empowerment of women’s working in the Indian apparel industry. Built from the WEAI for the agricultural industry, this study proposes a new WEIAI that could be applied in the wage earning women laborers in the apparel industry. Overall, the WEIAI is proposed to be measured by two components 5DE and GPI. The 5DE measures the (a)
role of women in household decision making around production and income generation, (b) women’s access to productive capital and credit, (c) women’s individual leadership, group membership and influence in the community, (d) women’s decision making & motivation for decision making and (e) women’s time allocation. The 5DE is calculated using the following equation

\[ 5DE = H_e + H_p \times A_e \]

The GPI is a relative inequality measure that reflects the inequality in 5DE profiles between the primary adult male and female in the household (Alkire, et al., 2013). GPI is calculated as \( GPI = 1 - (H_{GPI} \times I_{GPI}) \). The Women Empowerment Index in Apparel Industry (WEIAI) will be thereby calculated as \( WEIAI = 0.8(5DE) + 0.2(GPI) \).

WEAI for Bangladesh agricultural households for the sample areas in southwestern Bangladesh was found to be .762. It is a weighted average of the 5DE subindex value was 0.746 and the GPI subindex value was .899. The 5DE for Bangladesh shows that 39 % of women were empowered. In other words, 61 % of women who were not yet empowered and had inadequate achievements in 41.6 %of domains (Alkire et.al., 2012).

The domains in the Bangladesh study that contribute most to agricultural women’s disempowerment were weak leadership (30.6%) and lack of control over resources (21.6%). Approximately half of the women in the survey were not yet empowered and did not belong to any group. Forty-five % of women were not yet empowered and lacked access to credit and the ability to make decisions about it, and 28 % had little decision making power over the purchase, sale, or transfer of assets (Alkire et.al., 2012). However, little is known how much Indian apparel manufacturing women laborers are empowered. Consequently, the following research question is proposed:
Research question 2: What does the overall configuration of Indian apparel women laborers’ empowerment distribution look like? How are these answers similar to or different from other WEAI results done in other countries’ agricultural sectors?

Summary and research questions

Based on the review of the literature presented, this research employs the Alkire-Foster methodology to measure the women empowerment of women’s working in the Indian apparel industry. Built from the WEAI for the agricultural industry, this study proposes a new WEIAI that could be applied in the wage earning women laborers in the apparel industry.

The proposed research question are summarized as follows

Research question 1: Which domains contribute to the women empowerment distributions in women laborers in the Indian apparel industry, and who each of those domains affect women empowerment? How are these pictures similar to or different from other WEAI results done in other countries’ agricultural sectors?

Research question 2: what does the overall configuration of women laborers’ empowerment distribution? How are these answers similar to or different from other WEAI results done in other countries’ agricultural sectors?
CHAPTER III: METHODS

This chapter describes the research methods applied to achieve the objectives of the study. The methods section includes the following: (a) Research design, (b) Research instruments, (c) Sample selection, (d) Data collection, and (e) Data analysis procedure.

Research Design

In this research, the survey method was employed. As a systematic set of methods, survey research is used to collect information to generate knowledge, and to make conclusions (Lavrakas, 2008). The survey method is widely used by governments, businesses, academics, politicians, and numerous other decision makers.

According to the research objectives, specifically, a face to face survey is administered. The advantages of face to face surveys include the ability to target specific populations at a time and place of the participants’ convenience (Sax, Gilmartin, & Bryant, 2003). By using program surveys, respondents can review and verify their answers conveniently (Christian, Dillman, & Smyth, 2007). In addition, surveys allow for a great degree of anonymity, which may help to increase rates of valid responses, especially for questionnaires involving sensitive information (Lewis, Watson & White, 2009).

Face-to-face surveys have several key strengths. These surveys are clearly structured, flexible and adaptable. They are based on personal interaction and can be controlled within the survey environment. Physical stimuli can be used and respondents are able to be observed. On the other hand, there are also some disadvantages, such as interviewer bias, high cost per respondent, geographical limitations and time pressure on respondents (Holbrook et al., 2003;
This type of survey is more appropriate for my sample because of their lack of education, and access to computers.

**Pre Testing**

The initial interview for the pre testing the interview instrument was conducted in United States and India. The participant for pre testing in United States were eight female graduate students who had at least one year of industry experience in India. Five had industry experience in textiles and apparel, one in food, and two in service industries. The participant for pre testing in India were nine female daily laborers in textiles and apparel who had at least one year of working experience.

The results of pre testing US participants shared that, all the participants were able to understand the questions and did not request for any changes in the interview instrument. At the same time, their responses to the survey items showed .91 of WEIAI scale, which suggested highly empowered women.

The results of pre testing of Indian participants also showed that in general they were able to understand all the survey questions, except 2 questions. First, the pre-testing Indian participants needed extra explanation on “informal lending agencies” when asking their access to credit (survey item #18). Therefore, the survey question was changed to add more explanations on the types of informal lending agencies, such as borrowing from family members, friends, or relatives. Second, the participants needed more explanation on the meaning of “speaking in public” (survey item #21). Therefore, the examples of public speaking were added, such as raising your voices for household committees in the village, speaking with government officials about road conditions, etc. With these changes in survey items, their average WEIAI score was .68, suggesting relatively disempowered women to US participants.
**Research Instruments**

The survey includes the entire indicators discussed in the literature review and key demographic variables necessary to compute 5DE and GPI of WEIAI. English version was first translated into Tamil by a professional Tamil translator and the Tamil version will then be back translated to English by another professional Tamil translator to ensure translation was done appropriately. There was a small difference in means of expression between traditional Tamil and colloquial Tamil. For example, traditional “யாைர” was changed to more colloquial “யாr”. The changes were made keeping in mind the educational background of the study samples. The complete list of the survey items is available in Appendix A.

**Sample Frame**

The study samples were selected from the southern part of India. The study by Das and Ha-Brookshire (2014) found that the majority of the apparel manufacturing and export firms are located in southern region of India. Saha (2014) also found that the women labor participation rate is higher in the southern part of India compared to rest of India. Sample framework for target samples was selected using the following screening questions to ensure all respondents are adult women working in the apparel industry in India:

(a) What is your age? (Samples above 18 years were selected),

(b) What is your Gender? (Females were selected),

(c) Do you work in an apparel factory for full time? (In this study, full time refers to people working at least 8 hrs/day and 5 days a week. People who say “yes” were selected).

(d) How long you have been working in apparel factories overall? (people who have been working for at least 12 months were selected)
Data Collection

An Indian market research firm located in the Southern part of India, a hub of apparel exports in India, conducted face to face interviews on behalf of the researcher. ResearchTree (the market research firm) is counted among the top market research and consulting company in India and working for clients such as Levi’s, Sap, Unilever, Baxter and Accor. ResearchTree has 10 years of experience in ethnography studies and has trained researchers to conduct face to face quantitative interviews across 20 cities in India.

The researcher ensured that the market research firm’s researcher complete the CITI (IRB) program certificate. Upon approval of Institutional Review Board, the interview was conducted in the native language (Tamil) by the market research firm who recruited samples through advertisements in local newspapers, purposive sampling and snowball sampling. The data was collected in mid spring 2016.

Throughout the process, the researcher checked with the interviewers on a daily basis to ensure the integrity of data collection. Any discrepancy in data collection was reported to the researcher on a daily basis. Two discrepancies were reported. First, during the initial 60 sample collection, the time taken to complete the survey surpassed the maximum 45 minute time advertised. Therefore, the demographic questions were combined to speed up the answer so as to fit the whole interview within 45 minutes. Second, 12 out of 60 participants mentioned that, in addition to the full-time job at apparel manufacturing, they also had additional part-time jobs in other sectors. Therefore, we added additional screening question asking if they have additional part-time jobs. If so, those were excluded from the future data collecting and analyses to ensure the study sample framework represent full-time apparel manufacturing workers.
A total of 560 responses were collected by ResearchTree. Despite the screening question of age and working full time, 134 responses were not qualified for the study as the respondents’ did not have the minimum 12 months of full-time work experience. There were no missing data. Consequently, 426 responses were usable. Boomsma (1982, 1985) recommended a minimum sample size of 200 as an acceptable number for SEM analysis. In addition Dupont and Plummer (2014) also suggested a minimum sample size of 385 as an acceptable number for a 95% confidence level, .5 standard deviation, and a margin of error of +/- 5% study design. Therefore, 426 was deemed appropriate for this study. The total response rate was 44.5% where 1,258 participants were contacted. The response rate is higher than the average response rate for surveys (Goyder, 1985).

Data Analysis Procedure

ResearchTree mailed the hard copies of the responses to the researcher by mail. The researcher entered all responses manually into Excel. SPSS was used for data screening and assumption check. Strata and Mplus were used for data analysis.

Data Screening and assumption checks

All responses were transferred into a SPSS data file, then cleaned.

Outliers. Outliers were assessed by looking for cases where particular responses were beyond three standard deviations of the mean (Tabachnick & Fidell, 2013). Also, the Squared Mahalanobis distances of items were observed to see if potential outliers exist by SPSS. No outliers were found during the data screening process.

Normality. Through SPSS, normality assessments were made by measuring skewness, kurtosis and the Shapiro-Wilk test for univariate normality. Values for asymmetry and kurtosis between -2 and +2 are considered acceptable in order to prove normal univariate distribution
(George & Mallery, 2010). Overall, non-normality was not a hindrance to this data analysis and was determined for the measured variables in the model.

Once data was cleaned, the 5DE, GPI and WEIAI were calculated using Strata. To access construct validity, confirmatory factor analysis (CFA) measurement model was developed for 5DE and GPI using Mplus.

**Reliability of WEIAI Measuring Scales**

Changes being made to the existing WEAI scale to modify it to measure WEIAI, Cronbach’s $\alpha$ was analyzed to evaluate reliability of the scales. Hair, et. Al (2006) states that, the generally agreed upon lower limit for Cronbach’s $\alpha$ is .70, and that the limit may decrease to 0.60 in the case of exploratory research to measure reliability. The $\alpha$ levels of the input in productive decisions (.815), autonomy in production (.759), ownership of assets (.725), purchase, sale or transfer of assets (.714), and control over use of income (.786) are all above the .7 lower limit, indicating strong internal consistency of the respective items (Table 3).

**Table 3: Scale Reliabilities**

<table>
<thead>
<tr>
<th>Construct</th>
<th>Cronbach’s $\alpha$</th>
<th>Number of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input in productive decisions</td>
<td>.815</td>
<td>3</td>
</tr>
<tr>
<td>Autonomy in production</td>
<td>.759</td>
<td>4</td>
</tr>
<tr>
<td>Ownership of assets</td>
<td>.725</td>
<td>4</td>
</tr>
<tr>
<td>Purchase, sale or transfer of assets</td>
<td>.714</td>
<td>4</td>
</tr>
<tr>
<td>Control over use of income</td>
<td>.786</td>
<td>3</td>
</tr>
</tbody>
</table>
CHAPTER IV: RESULTS AND ANALYSIS

Chapter IV includes (a) Description of the sample including demographic characteristics; (b) Five domains of empowerment; (c) Gender Parity Index; (d) Women Empowerment Index in Apparel Industry (WEIAI); and (e) Result analysis

Description of Study Sample

Demographic Descriptions

Of the entire sample, gender of the participants was 423 (99.4%) female, and 3 participants (0.6%) did not disclose their gender. Of the entire sample, 170 (39.4%) of the participants were 18 to 27 years age, 95 (22.3%) of the participants were 28 to 37 years age, 43 (10.1%) of the participants were 38 to 47 years age, 110 (25.7%) of the participants were 48 to 57 years age, and 8 (1.8%) of the participants were 58 to 67 years age. Marital status was 80 (18.3%) single, 326 (76.4%) married, 11 (2.6%) divorced / widowed, 9 (2.3%) in a relationship. Educational background was 51 (11.7%) no education or illiterate, 75 (17.5%) has 1 to 5 years of education (equivalent to elementary education), 243(56.6%) has 6 to 10 years of education (equivalent to middle school), 35(8.3%) has 11 to 15 years of education (equivalent to high school), 4 (1.6%) has more than 15 years education (equivalent to college / diploma) and 18 (4.2%) did not disclose their education background. The participants were asked about the number of years they had education background and some of the participants did repeat years, hence number of years is not a true reflection for equivalent to education levels.

In the household characteristics, 391(91.8%) households had main male and female adults in the household and 35(8.2%) households had only main female adults in the household. In the participants’ years of experience, 160(37.5%) participants have 1 to 5 years of work
experience, 85(20%) participants have 6 to 10 years of work experience, 78(18.3%) participants have 11 to 15 years of work experience, 47(11.1%) participants have 16 to 20 years of work experience, 56 (13.3%) participants have more than 20 years of work experience. Table 4 shows demographic information in detail.

Table 4: Demographic Characteristics of Participants (N=426)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Female</td>
<td>423</td>
<td>99.4%</td>
</tr>
<tr>
<td>Did not disclose</td>
<td>3</td>
<td>0.6%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-27</td>
<td>170</td>
<td>39.4%</td>
</tr>
<tr>
<td>28-37</td>
<td>95</td>
<td>22.3%</td>
</tr>
<tr>
<td>38-47</td>
<td>43</td>
<td>10.1%</td>
</tr>
<tr>
<td>48-57</td>
<td>110</td>
<td>25.7%</td>
</tr>
<tr>
<td>58-67</td>
<td>8</td>
<td>1.8%</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>80</td>
<td>18.3%</td>
</tr>
<tr>
<td>Married</td>
<td>326</td>
<td>76.4%</td>
</tr>
<tr>
<td>Divorced / Widower</td>
<td>11</td>
<td>2.6%</td>
</tr>
<tr>
<td>In a Relationship</td>
<td>9</td>
<td>2.3%</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Years of Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>51</td>
<td>11.7%</td>
</tr>
<tr>
<td>1-5 (Equivalent to Elementary)</td>
<td>75</td>
<td>17.5%</td>
</tr>
<tr>
<td>6-10 (Equivalent to Middle School)</td>
<td>243</td>
<td>56.6%</td>
</tr>
<tr>
<td>10-15 (Equivalent to High School)</td>
<td>35</td>
<td>8.3%</td>
</tr>
<tr>
<td>15 and above (Equivalent to College)</td>
<td>4</td>
<td>1.6%</td>
</tr>
<tr>
<td>Did not disclose</td>
<td>18</td>
<td>4.2%</td>
</tr>
<tr>
<td>Household Characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female adults only</td>
<td>35</td>
<td>8.2%</td>
</tr>
<tr>
<td>Female and Male adults</td>
<td>391</td>
<td>91.8%</td>
</tr>
<tr>
<td>Years worked in Indian Apparel Industry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5 years</td>
<td>160</td>
<td>37.5%</td>
</tr>
</tbody>
</table>
Table 5: Means and Standard Deviation of Continuous Demographic Variables (N=426)

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>38.60</td>
<td>4.77</td>
</tr>
<tr>
<td>Years of Education</td>
<td>7.84</td>
<td>4.20</td>
</tr>
<tr>
<td>Years of work experience</td>
<td>6.87</td>
<td>4.60</td>
</tr>
</tbody>
</table>
**Five Domains of Empowerment**

The five domains of empowerment measure the proportions of the sample population’s empowerment adequacy in each of the domains. Table 6 shows the empowerment adequacy’s in each of the indicators and domains and also the percentage contributions of each of the domains and indicators. The 5DE score was calculated and found to be .71 out of 1. The 5DE score overall indicated that the participants do not have adequate empowerment in the five domains. A score of 0.80 and above is considered to be the adequate score to achieve empowerment.

Meanwhile, the overall 5DE score of .71 was compared with that of other countries. Although direct comparisons are not advisable due to the incompatible samples (apparel manufacturing women vs. agricultural women), reviewing the study results with those of other countries were expected to give some insights into an overall women empowerment picture. A cross country analysis of women empowerment index in agricultural households conducted in 13 countries showed that Cambodia has the highest 5DE score of .98. The study also found that Rwanda has 5DE score of .90, Uganda has 5DE score of .85, Malawi has 5DE score of .83. Bangladesh, Liberia, and Tajikistan has the lowest levels of empowerment with 5DE score of .65, .66, .68 respectively (Malapit, et al., 2014). Within this perspective, Indian apparel manufacturing workers’ 5DE score is lower than Malawi women in agricultural sector but higher than Bangladesh women in agricultural sector.

Within the 5DE, the study findings showed that income and leadership domains were found to contribute most towards the 5DE score with 23.7% contribution each. Resources contributed 21.6%, production contributed 19.5%, and time contributed only 11.4% (see Table 6).
Table 6: 5DE decomposed by dimension and indicator

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Production</th>
<th>Resources</th>
<th>Income</th>
<th>Leadership</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Input in productive</td>
<td>Ownership of Assets</td>
<td>Purchase, sale,</td>
<td>Access to and</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>decisions</td>
<td></td>
<td>or transfer of</td>
<td>decisions on</td>
<td>over use of</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>assets</td>
<td>credit</td>
<td>income</td>
</tr>
<tr>
<td>Censored Headcount %</td>
<td>.283</td>
<td>.321</td>
<td>.274</td>
<td>.612</td>
<td>.367</td>
</tr>
<tr>
<td>Contribution</td>
<td>9.1%</td>
<td>10.3%</td>
<td>2.6%</td>
<td>5.9%</td>
<td>13.2%</td>
</tr>
<tr>
<td>Absolute Contribution %</td>
<td>.0628</td>
<td>.071</td>
<td>.0407</td>
<td>.091</td>
<td>.164</td>
</tr>
<tr>
<td>Contribution by Dimension</td>
<td>19.5%</td>
<td>21.7%</td>
<td>23.7%</td>
<td>23.7%</td>
<td>23.7%</td>
</tr>
<tr>
<td>Workload</td>
<td>.0628</td>
<td>.0573</td>
<td>.0573</td>
<td>.0214</td>
<td></td>
</tr>
<tr>
<td>Leisure</td>
<td>.097</td>
<td>.097</td>
<td>.097</td>
<td>.097</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Censored Headcount is the percentage of individuals who have adequate empowerment score in the particular indicators. Absolute Contribution is the contribution of each indicator measured out of 1 towards calculating 5DE Empowerment scale.
Domain 1: Production

Table 7 shows the indicators of the production domain and their empowerment contribution. The results show that only 28.3% (100%-71.7%) of the women felt that they are empowered in providing inputs in productive decisions. The 71.7% of women who are not empowered have an average achieved empowerment of 67.4% (100% - 32.6%) in the making inputs in productive decisions. The input in productive decisions contributed 9.1% to the total of 5DE score, or 0.063 in absolute empowerment value out of 1.

The results also show that only 32.1% of the women are empowered in autonomy in productions. The 67.9% of women who are not empowered have an average achieved empowerment of 74.3% autonomy in productions. The findings showed that 67.9% of the respondents did meet the adequate score in autonomy in productions, contributes 25.7% towards the women’s disempowerment. The autonomy in productions contributed 10.4% for the 5DE scored with absolute empowerment contribution of .071.

The findings indicate that only 28.3% of the participants can make their voices heard when households make decisions regarding productive inputs such as selecting the type of job, type of livestock to grow, type of crops to grow for additional income from home production. The results also show that only 32.1% of the women can make their own personal decisions regarding the production decision making in the household. This is consistent with Indian culture because most household decisions are taken by the main male of the household (Munro et al., 2014). India being a patriarchal society, the households are mostly headed by the male (Virmani, 2014)

Overall, the production domain contributes 19.5% towards the disempowerment of women. This is similar to the agricultural households in Ghana and Haiti where production
domain contributes 17.6% and 22% respectively towards disempowerment of women (Malapit H., et al., 2014). Both Ghana and Haiti are patriarchal societies and therefore can explain the similarity in the contribution of productive decisions towards disempowerment (Lithur, 2016).

Table 7: Production Domain, decomposed by empowerment contribution

<table>
<thead>
<tr>
<th>Production Domain</th>
<th>Input in Productive Decisions</th>
<th>Autonomy in Productions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disempowered Headcount</td>
<td>71.7%</td>
<td>67.9%</td>
</tr>
<tr>
<td>Average Inadequacy Score</td>
<td>32.6%</td>
<td>25.7%</td>
</tr>
<tr>
<td>Empowerment Contribution</td>
<td>.063</td>
<td>.071</td>
</tr>
<tr>
<td>Percentage Contribution</td>
<td>9.1%</td>
<td>10.4%</td>
</tr>
</tbody>
</table>

Domain 2: Resources

Table 8 shows the indicators of the resource domain and their empowerment contribution. The results show that only 12.2% of the women are empowered in ownership of assets. The 87.8% (100% - 12.2%) of women who are not empowered have an average achieved empowerment of only 33.9% in ownership of assets. The ownership of assets contributed only 2.6% for the 5DE scored with absolute empowerment contribution of 0.018.

The results also show that only 27.4% of the women are empowered in making decisions regarding purchase, sale and transfer of assets. The 72.6% (100% - 27.4%) of women who are not empowered have an average achieved empowerment of 57.4% in purchase, sale and transfer of assets. The findings showed that 72.6% of the respondents did meet the adequate score in purchase, sale and transfer of assets, and contributes 42.6% towards the women’s
disempowerment. The purchase, sale and transfer of assets contributed 5.9% for the 5DE scored with absolute empowerment contribution of 0.041.

The findings also indicate that only 61.2% of the women are empowered in making decisions regarding access to credit. The 38.8% of women who are not empowered have an average achieved empowerment of 54.3% in access to credit. The findings showed that 38.8% of the respondents did meet the adequate score in access to credit. The items of access to credit contributes 45.7% towards the overall women’s disempowerment. The purchase, sale and transfer of assets contributed 13.2% for the 5DE scored with absolute empowerment contribution of .091.

The findings indicate that only 12.2% of the participants have household ownership, such as land, house, consumer durables, etc. The results also show that only 27.4% of the women can purchase, sell or transfer household assets. Indian Census household report states that 86.4% of the household assets are owned by the male members in the household (Census of India, 2011). Complex legal systems, male heir tradition, and patriarchal society (Haas School of Business & School of Law, 2015) can be some of the reasons for the low numbers of Indian women’s purchase, sell or transfer household assets. The results however show that 61.2% of the women can make decisions to loan or borrow cash / in kind. Easy access to credit and availability of multiple macro/micro lending avenues empowers the women in access to credit (Singh, 2015).

The resource domain contributes 21.7% towards the disempowerment of women. This is similar to the agricultural households in Bangladesh, Cambodia, and Rwanda here production domain contributes 22.3%, 24.5% and 24% respectively towards disempowerment of women (Malapit, et al., 2014). Bangladesh’s micro credit and community lending were thought to help in creating available credit for the common people (Phelps, 2016). Similarly in Cambodia and
Rwanda, the microfinance industry has grown multifold and provides credit to thousands of people (Chamrouen, 2009). These may explain the similar domain contribution towards women disempowerment.

Table 8: Resource Domain, decomposed by empowerment contribution

<table>
<thead>
<tr>
<th>Resource Index</th>
<th>Ownership of Assets</th>
<th>Purchase, sale or transfer of Assets</th>
<th>Access to and Decisions on Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disempowered Headcount</td>
<td>87.8%</td>
<td>72.6%</td>
<td>38.8%</td>
</tr>
<tr>
<td>Average Inadequacy Score</td>
<td>66.1%</td>
<td>42.6%</td>
<td>45.7%</td>
</tr>
<tr>
<td>Empowerment Contribution</td>
<td>.018</td>
<td>.041</td>
<td>.091</td>
</tr>
<tr>
<td>Percentage Contribution</td>
<td>2.6%</td>
<td>5.9%</td>
<td>13.2%</td>
</tr>
</tbody>
</table>

**Domain 3: Income**

Table 9 shows the income domain and its empowerment contribution. The results show that only 36.7% of the women are empowered in having control over use of their income. The 63.3% (100% - 36.7%) of women who are not empowered have an average achieved empowerment of only 55.7% in control over use of their income. The control over use of income contributed 23.7% for the 5DE scored with absolute empowerment contribution of .164.

The findings indicate that 36.7% of the participants has power over their income, i.e. they are more likely to be able to spend their earnings as per their will. The income domain contributes 23.7% towards the 5 DEs. However, studies in agricultural setting, revealed that income domain usually contributes between 4.1% to 14.2% towards disempowerment of women for counties such as Bangladesh, Cambodia, Kenya, Nepal, and Tajikistan (Malapit, et al., 2014).
Working in factories and getting salary paid regularly may provide a sense of control over use of their own income as seen in this study. Whereas in agriculture setting, a continuous flow of money lacks and that may be a reason behind the low percentages in contribution towards empowerment.

**Table 9: Income Domain, decomposed by empowerment contribution**

<table>
<thead>
<tr>
<th>Income Index</th>
<th>Control over use of Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disempowered Headcount</td>
<td>63.3%</td>
</tr>
<tr>
<td>Average Inadequacy Score</td>
<td>55.7%</td>
</tr>
<tr>
<td>Empowerment Contribution</td>
<td>.164</td>
</tr>
<tr>
<td>Percentage Contribution</td>
<td>23.7%</td>
</tr>
</tbody>
</table>

**Domain 4: Leadership**

Table 10 shows the indicators of the leadership domain and their empowerment contribution. The results show that only 45.1% of the women are empowered in group membership and influence in the group. The 54.9% (100% - 45.1%) of women who are not empowered have an average achieved empowerment of 57.4% in group membership. The input in productive decisions contributed 14.6% for the 5DE scored with absolute empowerment contribution of .101.

The results also show that only 28.3% of the participants are empowered in speaking in public. The 71.7% of women who are not empowered have an average achieved empowerment of 84.3% in speaking in public. The findings showed that 71.7% of the respondents did meet the adequate score in autonomy in productions, contributes 15.7% towards the women’s
disempowerment. The speaking in public indicator contributed 9.1% for the 5DE scored with absolute empowerment contribution of .063.

The findings indicate that 45.1% of the participants are active members in different groups and thereby have some influence in group work. The results also show that only 28.3% of the women have individual leadership and are comfortable in speaking in public. This is consistent with factory culture in patriarchal societies in India. People form different groups and participate in the group activities for collective benefit of the group (Agarwal & Ostrom, 2001). Trade Unions are an example of such a group that uses collective bargaining as an incentive for being an active member.

Overall, the leadership domain contributes 23.7% towards the disempowerment of women. This is similar to agricultural households in Honduras, Kenya, Zambia and Rwanda where production domain contributes 22.2%, 22.4%, 22.4%, and 24.3% respectively towards disempowerment of women (Malapit, et al., 2014).

Table 10: Leadership Domain, decomposed by empowerment contribution

<table>
<thead>
<tr>
<th>Leadership Index</th>
<th>Group Member</th>
<th>Speaking in Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disempowered Headcount</td>
<td>54.9%</td>
<td>71.7%</td>
</tr>
<tr>
<td>Average Inadequacy Score</td>
<td>42.6%</td>
<td>15.7%</td>
</tr>
<tr>
<td>Empowerment Contribution</td>
<td>.101</td>
<td>.063</td>
</tr>
<tr>
<td>Percentage Contribution</td>
<td>14.6%</td>
<td>9.1%</td>
</tr>
</tbody>
</table>
**Domain 5: Time**

Table 11 shows the indicators of the time domain and their empowerment contribution. The results show that only 25.7% of the women are empowered in amount of time spent at work. The 74.3% (100% - 25.7%) of women who are not empowered have an average achieved empowerment of 54.6% in workload time spent. The workload indicator contributes 8.3% for the 5DE scored with absolute empowerment contribution of .057.

The results also show that only 9.7% of the women are empowered in leisure activities. The 90.3% (100% - 9.7%) of women who are not empowered have an average achieved empowerment of 75.4% in time spent in leisure activities. The speaking in public indicator contributed 3.1% for the 5DE scored with absolute empowerment contribution of .021.

The findings indicate that only 25.7% of the participants are empowered in the amount of time spent in working. This can be attributed towards the time demands of the apparel industry. The apparel industry is one of the most intensive manual labor industry (Murrav, 1995). The results also show that only 9.7% of the women are satisfied with the amount of time spent on leisure activities. This can also be related to the labor demands made by the apparel industry. Long working hours and working six days a week are common practices in the industry (Reuters, 2016) and thus explains the low number of women being satisfied with the amount of time spent on leisure activities.

The time domain contributed only 11.4% towards the disempowerment of women. This is contrast to agricultural households in Cambodia, Malawi, Rwanda, Uganda, and Zambia where time domain contributes 32%, 25.9%, 28.4%, 32.9%, and 31.3% respectively towards disempowerment of women (Malapit, et al., 2014). The difference in the work setting between
the agriculture and factory setting can be a reason behind the difference in the contribution towards empowerment / disempowerment.

<table>
<thead>
<tr>
<th>Time Index</th>
<th>Workload</th>
<th>Leisure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disempowered Headcount</td>
<td>74.3%</td>
<td>90.3%</td>
</tr>
<tr>
<td>Average Inadequacy Score</td>
<td>54.6%</td>
<td>75.7%</td>
</tr>
<tr>
<td>Empowerment Contribution</td>
<td>.057</td>
<td>.021</td>
</tr>
<tr>
<td>Percentage Contribution</td>
<td>8.3%</td>
<td>3.1%</td>
</tr>
</tbody>
</table>

**5DE CFA Measurement Model**

To assist in interpreting 5DE following the AF model, the structural relationships between the domains, indicators, and items were also measured using a second order factor confirmatory factor analysis (CFA) model using maximum likelihood measurement (Smith, 2006). As Anderson and Gerbing (1998) stated, measuring the structural relationships between latent variables involves developing the a priori theoretically justified hypothesized causal model and assessing the model for goodness of fit.

The second order CFA model was analogous to the WEIAI model; however, Lagrange Multiplier Test was used to improve the model fit. Model fit was evaluated using several indices including Comparative Fit Index (CFI), Tucker Lewis index (TLI), and Root Mean Square Error of Approximation (RMSEA).
Through the measurement model, a few items were suggested to be correlated, and the item’s path addition procedure was conducted one at a time. Through this process, correlation paths were added between two items within the access to credit construct, and three items within ownership of assets, and purchase sale and transfer of asset constructs. Second, additional one correlation path was added between leisure time and work time.

In terms of construct reliability, the scales included in this model exhibited acceptable reliability with Cronbach’s α over .70 (Joseph et al., 2006). Production domains reliability fell within acceptable range with: input in productive decision at .815 and autonomy in production at .759. Resource domains reported the indicator construct reliability at ownership of assets (.725), purchase sale and transfer of assets (.714), and access to credit (.748). Income domains’ control over income construct reported reliability at .786. Leadership and time domain’s indicator construct reported reliability at group membership (.902), speaking in public (.863), workload (.768) and leisure (.885).

The convergent and discriminant validity of the measurement model was also checked. First, all AVEs (average variance extracted) of each latent construct was evaluated and found to be above a cut off criterion of .50 or higher, supporting convergent validity (Hair et al. 2011). Second, the AVE of each latent construct was higher than the construct’s highest squared correlations with any other latent constructs, supporting discriminate validity (Hair, Ringle, & Sarstedt, 2011). Table 12 shows the factor loadings and reliability of each construct of 5DEs.
Table 12: Factor Loadings and Reliability of Constructs of 5DEs (n=426)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>Standardized Parameter Estimates</th>
<th>Est / S.E.</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input in Productive Decisions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cronbach’s Alpha = 0.815</td>
<td>I1</td>
<td>.903</td>
<td>33.527</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>I2</td>
<td>.626</td>
<td>22.259</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>I3</td>
<td>.977</td>
<td>46.521</td>
<td>.001</td>
</tr>
<tr>
<td><strong>Autonomy in Production</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cronbach’s Alpha = 0.759</td>
<td>A1</td>
<td>.973</td>
<td>13.507</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>A2</td>
<td>.919</td>
<td>13.296</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>A3</td>
<td>.880</td>
<td>21.929</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>A4</td>
<td>.540</td>
<td>8.307</td>
<td>.001</td>
</tr>
<tr>
<td><strong>Ownership of Assets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cronbach’s Alpha = 0.725</td>
<td>O1</td>
<td>.776</td>
<td>23.019</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>O2</td>
<td>.803</td>
<td>43.931</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>O3</td>
<td>.747</td>
<td>36.515</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>O4</td>
<td>.589</td>
<td>21.961</td>
<td>.001</td>
</tr>
<tr>
<td><strong>Purchase sale and transfer of</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>assets</td>
<td>P1</td>
<td>.941</td>
<td>52.494</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>P2</td>
<td>.856</td>
<td>44.920</td>
<td>.001</td>
</tr>
<tr>
<td>Cronbach’s Alpha = 0.714</td>
<td>P3</td>
<td>.666</td>
<td>30.403</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>P4</td>
<td>.703</td>
<td>28.953</td>
<td>.001</td>
</tr>
<tr>
<td><strong>Access to Credit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cronbach’s Alpha = 0.748</td>
<td>C1</td>
<td>.761</td>
<td>10.664</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>C2</td>
<td>.823</td>
<td>8.739</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>C3</td>
<td>.740</td>
<td>6.477</td>
<td>.001</td>
</tr>
<tr>
<td><strong>Control over Income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cronbach’s Alpha = 0.786</td>
<td>IN1</td>
<td>.708</td>
<td>12.168</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>IN2</td>
<td>.789</td>
<td>12.475</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>IN3</td>
<td>.884</td>
<td>4.540</td>
<td>.001</td>
</tr>
<tr>
<td><strong>Group Membership</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cronbach’s Alpha = 0.902</td>
<td>G1</td>
<td>.737</td>
<td>17.737</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>G2</td>
<td>.734</td>
<td>13.884</td>
<td>.001</td>
</tr>
<tr>
<td><strong>Spekaing in Public</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cronbach’s Alpha = 0.863</td>
<td>S1</td>
<td>.708</td>
<td>15.887</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>S2</td>
<td>.768</td>
<td>25.358</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>S3</td>
<td>.881</td>
<td>17.485</td>
<td>.001</td>
</tr>
<tr>
<td><strong>Worload</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cronbach’s Alpha = 0.768</td>
<td>W1</td>
<td>.850</td>
<td>24.767</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>W2</td>
<td>.766</td>
<td>23.890</td>
<td>.001</td>
</tr>
<tr>
<td><strong>Leisure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cronbach’s Alpha = 0.885</td>
<td>L1</td>
<td>.729</td>
<td>22.937</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>L2</td>
<td>.761</td>
<td>22.104</td>
<td>.001</td>
</tr>
</tbody>
</table>

Note: Item numbers with their corresponding survey questionnaire number can be found in Appendix D.; EST./S.E. is the estimates divided by their respective standard errors.
Finally, the measurement model of all variables in the CFA model had a $\chi^2$ value of 1029 ($df = 359; p$-value $< .001$), a corresponding CFI of .890 and RMSEA of .049, suggesting acceptable levels of model fit. The loadings for all the factors were high, and corresponding $t$-values are statistically significant.

The production domain was positively correlated with resource ($r = .180, p$-value $= .01$), income ($r = .164, p$-value $= .01$) and time ($r = .019, p$-value $= .01$) domains. The resource domain was also positively correlated with income ($r = .114, p$-value $= .01$), leadership ($r = .134, p$-value $= .01$) and time ($r = .129, p$-value $= .01$) domains. The leadership domain was positively correlated with time ($r = .148, p$-value $= .01$) and income ($r = .024, p$-value $= .01$) domains. Leadership domain was negatively correlated with production ($r = -.137, p$-value $= .01$) and income domain was negatively correlated with time ($r = -.177, p$-value $= .01$). However, overall correlations were low. Table 13 shows the correlation between the domains.

Table 13: Correlation Matrix of the Five Domains

<table>
<thead>
<tr>
<th></th>
<th>Production</th>
<th>Resource</th>
<th>Income</th>
<th>Leadership</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resource</td>
<td>.180</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>.164</td>
<td>.114</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership</td>
<td>-.137</td>
<td>.134</td>
<td>.024</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>.019</td>
<td>.129</td>
<td>-.177</td>
<td>.148</td>
<td>1</td>
</tr>
</tbody>
</table>
Input in productive decisions (standardized $\beta=.748$; $t$-value = 2.100; $p$-value <.001) and autonomy in production (standardized $\beta = .673$; $t$-value = 1.652; $p$-value <.05) were found to have a direct positive effect on production domain. Ownership of assets (standardized $\beta=-.708$; $t$-value = 2.336; $p$-value <.001), purchase, sale and transfer of assets (standardized $\beta=.734$; $t$-value = 1.228; $p$-value <.05) and access to and decisions about credit (standardized $\beta = .984$; $t$-value = 0.968; $p$-value <.001) were found to have a direct effect on resource domain. Ownership of assets was found to have a negative effect (that is, lack of ownership of assets negatively affects the control over resources domain of women empowerment), while purchase, sale and transfer of assets and access to and decisions about credit had a positive effect on resource domain.

Control over use of income (standardized $\beta = .858$, $t$-value = 2.890; $p$-value <.001) was found to have a direct positive effect on income domain. Group membership (standardized $\beta=.803$; $t$-value = 1.674; $p$-value <.001) was found to have a positive direct effect on leadership domain while public speaking (standardized $\beta = -.665$; $t$-value = 2.309; $p$-value <.001) was found to have a negative direct effect on leadership domain (that is, inability to speak in public negatively affects the leadership domain of women empowerment). Workload (standardized $\beta=.614$; $t$-value = 0.228; $p$-value <.001) had a positive direct effect on time domain while leisure (standardized $\beta = -.734$; $t$-value = 2.733; $p$-value <.05) had a negative direct effect on time domain (that is, lack of leisure time negatively affects the time allocation domain of women empowerment).
### Table 14: 5DE model Parameter Estimates, t-value, and Significance levels (n=426)

<table>
<thead>
<tr>
<th>Path</th>
<th>Standardized Parameter Estimates</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input in Productive decisions → Production Domain</td>
<td>.748</td>
<td>2.100</td>
<td>.001</td>
</tr>
<tr>
<td>Autonomy in Production → Production Domain</td>
<td>.673</td>
<td>1.652</td>
<td>.050</td>
</tr>
<tr>
<td>Ownership of Assets → Resource Domain</td>
<td>-.708</td>
<td>2.336</td>
<td>.001</td>
</tr>
<tr>
<td>Purchase, sell, transfer of Assets → Resource Domain</td>
<td>.734</td>
<td>1.228</td>
<td>.050</td>
</tr>
<tr>
<td>Access to Credit → Resource Domain</td>
<td>.984</td>
<td>0.968</td>
<td>.001</td>
</tr>
<tr>
<td>Control over use of Income → Income Domain</td>
<td>.858</td>
<td>2.890</td>
<td>.001</td>
</tr>
<tr>
<td>Group Membership → Leadership Domain</td>
<td>.803</td>
<td>1.674</td>
<td>.001</td>
</tr>
<tr>
<td>Speaking in Public → Leadership Domain</td>
<td>-.665</td>
<td>2.309</td>
<td>.001</td>
</tr>
<tr>
<td>Workload → Time Allocation</td>
<td>.614</td>
<td>.228</td>
<td>.001</td>
</tr>
<tr>
<td>Leisure → Time Allocation</td>
<td>-.734</td>
<td>2.733</td>
<td>.050</td>
</tr>
</tbody>
</table>

Access to and decisions about credit had the highest positive effect (standardized $\beta = .984$; $t$ value = 0.968; $p$ value <.001) on 5DE followed by control over the use of income and group membership (standardized $\beta = 0.858$, $t$ value = 2.890; $p$ value <0.001). Three constructs
showed negative impact on women empowerment. Lack of leisure time and the lack of asset ownership were found to have the stronger negative impact than the inability to speak in public on the overall 5DE. In the AF method each domain is assumed to have an equal weight on 5DEs. However the CFA model analysis shows that some domains have greater impact on 5DE.

**Gender Parity Index**

Table 15 shows the GPI values derived from the study data. The GPI shows that, out of 391 participants who live in household with other males, 64.2% of those participants experience no gender parity with the primary males in their households. The empowerment gap between them and the males in their households was quite large at 29.1%. The overall GPI of the study participants was calculated to be .813.

As gender parity measures the household dynamics of male and female in the household, the social structure of the region plays an important role in understanding the gender parity similarities and dissimilarities. Agricultural households in Bangladesh, Kenya and Ghana were found to have similar GPI of .80, .81 and .81 respectively (Malapit, et al., 2014). All of these countries have patriarchal societies (United Nations Statistical Division, 2010)

**Table 15: Gender Parity Index**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of Women with no Gender Parity</td>
<td>64.2%</td>
</tr>
<tr>
<td>Average Empowerment Gap</td>
<td>29.1%</td>
</tr>
<tr>
<td>Gender Parity Index</td>
<td>.813</td>
</tr>
<tr>
<td>Number of Women in dual households</td>
<td>391 (i.e. 91.8% of the data)</td>
</tr>
</tbody>
</table>
**Women’s Empowerment Index in the Apparel Industry (WEIAI)**

In this study, WEIA was calculated to be 0.730, with 5DE value of 0.710 and GPI value of 0.813 (see Table 16). Overall, the 5DE showed that 24.2% of the participants were empowered, that is, 75.8% of them felt disempowered, with an average inadequacy score being 47.5%. The domains that contributed the most to women’s disempowerment were the lack of leadership in the community (23.7%) and the lack of control over the use of income (23.7%)—although this score was higher than agricultural households in other countries. More than 60% of women were found to be disempowered, lacked access to credit, and lacked the ability to make decisions about credit. Out of the total participants, 45.1% indicated they are not group members, and 36.7% lacked sole or joint decision making power over income.

**Table 16: Result of WEIAI**

<table>
<thead>
<tr>
<th>Indexes</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disempowered Headcount (H)</td>
<td>75.8%</td>
</tr>
<tr>
<td>Average Inadequacy Score (A)</td>
<td>47.5%</td>
</tr>
<tr>
<td>Disempowerment Index (M₀)</td>
<td>0.290</td>
</tr>
<tr>
<td>5DE Index (1 - M₀)</td>
<td>0.710</td>
</tr>
<tr>
<td>Number of Observations</td>
<td>426</td>
</tr>
<tr>
<td>Percentage of women with no gender parity (H₀)</td>
<td>64.2%</td>
</tr>
<tr>
<td>Average Empowerment Gap (I₀)</td>
<td>29.1%</td>
</tr>
<tr>
<td>Gender Parity Index</td>
<td>0.813</td>
</tr>
<tr>
<td>WEIAI</td>
<td>0.730</td>
</tr>
</tbody>
</table>

*Notes: WEIAI = Women’s Empowerment Index for Apparel Industry; 5DE = five domains of Empowerment*
Comparison of WEIAI and WEAI

The WEIAI score was then compared with WEAI scores of other countries. Given that WEAI scores are derived from the agricultural households, direct comparisons are not advisable. However, the comparisons still show some insights as to how the study participants could measure against women in agricultural households in other countries. Table 17 list the WEAI indices reported by previous studies and the WEIAI score derived from this study.

Table 17: WEIAI and WEAI Comparison

<table>
<thead>
<tr>
<th>Country</th>
<th>Sources</th>
<th>Region</th>
<th>5DE</th>
<th>GPI</th>
<th>WEAI</th>
<th>Number of Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>Current Study</td>
<td>Asia</td>
<td>.71</td>
<td>.81</td>
<td>.73**</td>
<td>426</td>
</tr>
<tr>
<td>Cambodia</td>
<td>Malapit, et al. (2014)</td>
<td>Asia</td>
<td>.98</td>
<td>.99</td>
<td>.98</td>
<td>650</td>
</tr>
<tr>
<td>Rwanda</td>
<td>Malapit, et al. (2014)</td>
<td>East Africa</td>
<td>.90</td>
<td>.96</td>
<td>.91</td>
<td>1,481</td>
</tr>
<tr>
<td>Uganda</td>
<td>Alkire, et al. (2013)</td>
<td>East Africa</td>
<td>.85</td>
<td>.92</td>
<td>.86</td>
<td>1,801</td>
</tr>
<tr>
<td>Malawi</td>
<td>Malapit, et al. (2014)</td>
<td>Southern</td>
<td>.83</td>
<td>.91</td>
<td>.84</td>
<td>2,926</td>
</tr>
<tr>
<td>Haiti</td>
<td>Malapit, et al. (2014)</td>
<td>Central</td>
<td>.83</td>
<td>.94</td>
<td>.82</td>
<td>1,383</td>
</tr>
<tr>
<td>Zambia</td>
<td>Malapit, et al. (2014)</td>
<td>Southern</td>
<td>.79</td>
<td>.89</td>
<td>.80</td>
<td>1,325</td>
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Note: ** represents the present study

The review of the WEAI and WEIAI warranted closer comparisons between WEIAI and WEAI in four specific countries—Bangladesh, Uganda, Cambodia, and Nepal. Bangladesh and Uganda showed similar WEAI scores with similar distributions of 5DEs and GPI to those of WEIAI. While, Cambodia and Nepal showed strikingly different WEAI scores and distributions of 5DEs and GPIs from those of WEIAI.
First, the WEAI for the sample areas in southwestern agricultural households in Bangladesh was found to be .662, with a 5DE subindex value of .65 and GPI subindex value of .80. The domains in the Bangladesh’s agricultural households that contributed the most to women’s disempowerment were weak leadership (30.6 %) and lack of control over resources (21.6 %). Approximately half of the women in the survey were disempowered and did not belong to any group. Forty-five % of women were also disempowere as they lacked access to credit and the ability to make decisions about it, and 28 % had little decision-making power over the purchase, sale, or transfer of assets. The study findings in Indian manufacturing households were smiliar to Bangladesh agricultural households yet there were two notable differences. First, Indian manufacturing women had slightly higher score on control over the use of income. Second, women in Bangladesh agricultural households had slightly higher GPI.

In the same study by Alkire, et al. (2013), they also found that the WEAI Uganda being 0.800, with 5DE subindex value of .789 and GPI subindex value of .898. The domains that contribute most to women’s disempowerment are time burden (26.3 %) and lack of control over resources (23.1 %). According to these study results, 48.7 % of women were disempowered, and lack access to or decision-making ability over credit. Out of the participants, 30.7 % did not feel that they have manageable workload, and 31.9 % did not belong to any groups. These findings were different from Indian manufacturing women in that, first, Indian manufacturing women had slightly lower GPI, and, second, women in Rewanda agricultural households bore burdened with time allocation.

Malapit, et al. (2014) in a multi country WEAI analysis found that in Cambodia, the overall WEAI score was .98, with a a striking 92.6 % of women seemed to achieve adequate empowerment, and 94.7 % of the women in the survey thought they have achieved gender parity.
The indicator that made the greatest contribution to empowerment for women was the ability to choose their time usage freely (32%). Similarly, in Nepal, the WEAI score was found to be .80, with 41% of women have achieved adequate empowerment and 53.2% of women without gender parity. The indicators that contributed the most to female disempowerment were group membership (37%), workload (25%), and autonomy in production (15.6%). These findings were significantly different from women in Indian manufacturing households in that, both women in agricultural households in Cambodia and Nepal felt much more empowered, with higher GPI and 5DE scores. Political structure, such as communism, is a common thread between both countries. It might be one reason as to why both countries have extremely high GPIs.
CHAPTER V: CONCLUSIONS

Chapter 5 contains the following sections: (a) Overview of the study, (b) Contributions and implications, and (c) Study limitations and future research opportunities.

Overview of the Study

The significant role that women empowerment plays in economic and social development has led practitioners and researchers to search for the indicators that affect women empowerment (Malhotra & Schuler, 2005). Women empowerment scales, such as WEAI, have been developed in the agricultural sector, which is the largest provider of female employment in the world (The World Bank, 2015). However, scales to measure the women empowerment for the second largest provider of female employment in the world, textile and apparel manufacturing, is non-existent. Therefore, the study developed WEIAI, the index measures the degree of women empowerment within the apparel manufacturing households. The WEIAI consists of 5DE and GPI. The 5DE convey the percentage of women who are empowered and the intensity of disempowerment in the areas of production, resources, time, income, and leadership. The GPI shows the percentage of women who enjoy gender parity and the gap between women and men. (Alkire, et al., 2013).

Based on the Alkire-Foster methodology (Alkire & Foster, 2007), the research specifically measured the women empowerment level of women working in the Indian apparel industry and the domains that contribute to the women empowerment distributions. Toward that end, this study proposed the following research questions:
**Research question 1:** Which domains contribute to the women empowerment distributions in women laborers in the Indian apparel industry, and who each of those domains affect women empowerment? How are these pictures similar to or different from other WEAI results done in other countries’ agricultural sectors?

**Research question 2:** What does the overall configuration of women laborers’ empowerment distribution? How are these answers similar to or different from other WEAI results done in other countries’ agricultural sectors?

To find the answers to the research questions, a face to face survey was conducted by modifying the existing women empowerment in agriculture index scale. A market research firm was employed, targeting adult (18 years and above) female apparel workers with at least 1 year of full-time work experience in the apparel industry. 426 usable survey responses were collected. The data was cleaned and analyzed. There were several major findings which are listed below.

First, the study participants were found to be disempowered. The overall WEIAI for the participants was .73. The result was found to be similar to WEAI of Bangladesh women, which was .66, i.e. Bangladesh agricultural female workers were slightly more disempowered than the study participants (Alkire, et al., 2013). The study participants were less empowered than women in agricultural households in Nepal (WEAI = .80), another neighboring country of India.

Second, the five domains of empowerment in this study show that only 28.7% of the participants felt that they are empowered. On average, the participants met only 43.5% of the cut off scores in all five dimensions. This was similar to Bangladesh but different from Cambodia and Nepal. In Bangladesh 29.6% of the participants felt that they are empowered and met 41.6% of the cut off scores in all five dimensions where as in Cambodia 86.4% of the participants felt
that they are empowered and met 92.8% of the cut off scores in all five dimensions. In Nepal, 77.2% of the participants felt that they are empowered and met 82.3% of the cut off scores in all five dimensions.

Third, the gender parity index in this study showed that only 35.8% of the participants felt that they equal power against primary males in their households. Also, 29.1% of the participants experienced large empowerment gap between women and men in their households. The results were similar to that of Bangladesh, where 37.2% of the participants felt that they equal power against primary males in their households and 32.7% of the participants experienced large empowerment gap between women and men in their households.

Fourth, the domains that contribute the most to women’s disempowerment in this study were the lack of leadership in the community (23.7%) and the lack of control over the use of income (23.7%)—even thought this number itself is much higher than women in agricultural households.

Fifth, the domains that contributed the least to women’s disempowerment in this study was the ability to use their time freely (11.4%). This result differed from that of Bangladesh. In Bangladesh, ownership of assets (4.6%) was found to least contribute to women’s disempowerment.

Sixth, more than 60% of the participants felt they are disempowered and lacked access to credit and the ability to make decisions about it. Overall, 45.1% were not group members, and 36.7% lacked sole or joint decision making power over income.

Finally, the study confirmed the 5 DE sub-index model via confirmatory factory analysis. In the CFA model, however, unlike AF model, each domain and each indicator seemed to have
different weights on 5DEs, suggesting further research on the role of each indicator and domain of 5DEs in women empowerment in the apparel manufacturing sector.

**Contributions and Implications**

This study provides several important contributions to the women empowerment literature, particularly with regard to the global apparel manufacturing industry. This section discusses the study’s contributions and implications from the perspective of theory development, industry, education, and policy makers.

**Theoretical Contributions and Implications**

First, the greatest contribution of this study is to define and highlight the domains of women empowerment indices and how multidimensional indices can be used to provide an overall analysis of women’s (dis)empowerment. This is one of the first attempts to measure women empowerment in apparel manufacturing households. As countries industrializes, more developing countries will move from agricultural based economy to manufacturing driven economies. Measuring women’s empowerment in manufacturing sectors can help further assessing and improving women’s well-being beyond agricultural households. Specifically, this is the one of the first studies looked at women empowerment in India, offering the overall picture of Indian women manufacturing laborers’ women empowerment.

By expanding theory from agricultural households to apparel manufacturing, second, the results showed this women empowerment structure could also work for non-farm household situations, specifically for the apparel manufacturing industry. However, further modifications are advised as evidenced by the CFA results of the study. The CFA results showed that the production domain may have a higher weight on 5DE than the leadership domain, while AF
method advises equal weights for all of the five domains. In this study, as much as leadership might be important for women empowerment, apparel manufacturing laborers in India seemed to be yearning for more power or control over their productive choices, such as employment section, household cash crop/livestock production planning, family enterprise endeavor, and the use of the income that they earned. Given that this type of power over productive resources within their household could be the foundation of their future leadership roles in their communities, perhaps, higher weight on productive decisions would be more appropriate than giving equal weights to both productive decisions and leadership domains. This finding suggests that the productive decision domain may be one of the key differences in women empowerment between non-farm and farming households because of the fact that productive activities that these women can engage in these two sectors are different (e.g., becoming a salaried factory worker or an at-home farmer), and lack of decision power in selecting such productive activities could impact women’s (dis)empowerment tremendously. Therefore, the finding suggests different ways to look at empowerment issues of the women in the manufacturing or any other industry sectors that might have unique challenges and opportunities from the agricultural sector.

Third, the 5DE could also provide additional scope of the corporate social responsibility literature. Typical corporate social responsibility research investigates whether companies are meeting the minimum standards of codes of conduct. However, this study shows that women may have live two different worlds –one at work and the other at work. That is, without control over their income and wage that they earn at work may not help them better in their lives. Therefore, corporate social responsibility research could include true growth in women empowerment in productions, resources, income, leadership, and time, beyond satisfying
minimum requirements of codes of conduct. The findings of 5DE suggests whole new ways to approach to increase in welfare of the factory workers.

**Contribution and Implications to Industry, Government, and Education**

When women are not reaching their potential in their work or career, it affects not just their own lives but makes a whole society poorer. Women's empowerment brings with it economic and social benefits for entire populations. Women empowerment impacts the industry, government, and education, and contributes to the advancement of the society.

The results could help apparel businesses who want to improve women workers’ well-being within the specific domain. For example, improving the control over the finances can give a woman dignity and purpose, greater security, better access to and control over resources. In India, most women workers receive their salary in cash. This cash typically disappears in the informal economy and is difficult to track as to how these women spend or save their incomes. Perhaps, helping these women to open up a bank account in their own names, and paying them directly to formal financial institutions may give a better chance for them to control over their own incomes. Government also wants to make it easier for women workers to open up their bank accounts. Currently, in India, banks requires residence proof for bank accounts. However, most real-estate assets are in the name of heads of households, who are usually husbands, fathers, or fathers-in-law. Therefore, women are less likely to be part of formal economy and more likely to lose control over income. Therefore, businesses who are truly interested in helping their well-being, they may want to consider different salary payment options that include formal financial institutions.

Similarly, providing better time management and lean workloads can create a positive work environment and make the workload less burdensome to these women. For example, in this
study, 74.3% of the respondents reported that they work more than 10 hours daily, including overtime, and this long workhour contributed 54.6% towards the women’s disempowerment. At the same time, 90.3% of the respondents reported that they are not satisfied with the time spent in leisure activities, and this dissatisfaction contributed 75.7% towards the women’s disempowerment. By law, in India, normal working hours are 8 hours a day. If anyone wants to work over time, she or he may be able to do so for up to 4 hours a day but no more than 3 times a week. The overtime work pay should be double of their regular hourly wage. Despite this strict law, the participants in this study reported that they work more than 10 hours a day on a daily basis without any over time extra wages. Therefore, the women workers are overworked, fatigued, and less empowered in their lives. Both apparel businesses and Indian government agencies must be more vigilant with women workers’ work schedules and overtime payment. Close-up auditing would be desired. Foreign buyers may want to enforce factory owners and managers to follow the laws. Businesses and governments may want to give opportunities to these women workers to be able to speak out without fearing any repercussions.

Leadership in the industry is another aspect where women’s well being and empowerment is affected. Lack of leadership, leadership training, and organization support are some of the factors which contribute towards lack of group membership and lack of confidence. Providing an amiable group environment can increase women participation in groups and thereby increase women empowerment. The results show that only 45.1% of the women are empowered in group membership and influence in the group. Promoting more women to leadership levels within the factory may help enhance these women’s well-being. Both foreign buyers and Indian government have an opportunity to help factory owners to encourage the development of women leadership within the factories.
The lack of equal opportunities for women in the various aspects leads to disempowerment of women. An increase in female labor force participation or a reduction in the gap between women’s and men’s labor force participation results in faster economic growth (OECD, 2012). Also when the share of household income controlled by women increases, through their own earnings, changes spending in ways that benefit children of the households (World Bank, 2012). Women also tend to have less access to formal financial institutions and saving mechanisms. World Bank (2014) found that only 47% of women do worldwide have an account at a formal financial institution. This gap is largest among lower middle-income economies in South Asia. Improving women’s access and providing equal opportunities will have a huge impact on the economy and will contribute towards the nation’s welfare. Industry, government, and education can all work toward this equal opportunity to get a job and lead a team at work.

The study’s results show that domains of empowerment, gender parity and gender relations are important aspects of the women empowerment. It is suggested that educators need to incorporate related content into their curricula. The typical corporate responsibility class and human resource management courses does not provide enough knowledge about the gender parity and the empowerment domains of the workforce. For example, including the content of different cultural, social, and financial environments that women workers face in different countries may be useful for students to learn and help empower women workers in developing countries. Educating the population about gender parity and equality will help develop future managers and leaders who are aware of the importance of empowerment and its positive impact on growth. The understanding of empowerment indicators will help students identify and increase the factors for empowerment.
Limitation and Future research

Several limitations are identified in this study, accordingly leading to future research opportunities. First, the samples were focused on the apparel employees working in the Tirupur apparel export hub. Comparisons with other Indian apparel export hubs were not done. Thus, further research is suggested to expand the scope of this study to explore the different regions in and outside India to measure women empowerment in the apparel industry. Also, a national survey could be conducted to include a representative sample of firms exporting apparels.

Second, despite the relevant modifications, the validity of WEIAI has to be further established with larger and wider sample frames, and additional repeated tests. Therefore, generalizations of the results should be done with caution. Large samples and quantitative studies should be undertaken to verify the indicators and domains of empowerment and their contribution towards empowerment. Further studies are necessary to continue to assess and help improve women empowerment in the modern day manufacturing sector in developing countries.

Third, the study measured women empowerment by assessing the women’s household structure. This does not mean that women empowerment is only possible within their household setting. Women empowerment could be affected by larger scopes of communities in which these women live. Women empowerment could be affected by regional cultures that affect women’s expected behavior. It could also be affected by political and social unrests within the country. Therefore, further study is recommended to include macro-environmental factors, such as culture, economics, political, and social pressures, which may have impact on women empowerment.

Fourth, the study did not look into the household characteristics that could affect women empowerment. For example, the presence or number of children within the household, the
presence or number of other females who could share domestic duties, or the presence or number of parents or relatives to whom the women have to give care, were not accounted to assess women participants. These are important factors for women’s well-being as they all require different duties yet significant time of the women when they are off work. Further research is recommended to develop more comprehensive list of women empowerment index to assess and help improve these women’s well-being.
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APPENDIX A: INTERVIEW INSTRUMENT (ENGLISH)
WOMEN’S EMPOWERMENT INDEX in APPAREL INDUSTRY

Demographic Questions
1. What is your Gender
   1. Male
   2. Female
   3. Prefer not to disclose

2. What is your age?

3. What is your Marital Status?
   1. Single
   2. Married
   3. Divorced / Widower
   4. In a Relationship
   5. Other, Please specify __________________

4. Number of years of Education?

5. Who is or are present in households
   1. Male and Female adults
   2. Female adults only

6. Do you work in an apparel factory for full time? (Yes/No); If Yes proceed to question 7, else end interview

7. How long have you been working in the Indian apparel factories?

8. Do you work in any part time jobs?

Household Decision Making: Production and Income Generation
9. Did you participate in salaried employment in apparel factories in the past 12 months?
   1. Yes
   2. No [if No move to question 11]

10. In the past 12 months, how much input did you have in making that employment decision within your household?
    1. No input
    2. Little input
    3. Some input
    4. Most input
    5. Total input
11. In the past 12 months, how much input did you have as to how to use the income that you earned?
   1. Input into no decisions
   2. Input into very few decisions
   3. Input into some decisions
   4. Input into most decisions
   5. Input into all decisions

The above 3 questions will be repeated for the following 3 additional items {the bolded phrase will be replaced for each question}:
   a. family business / small business
   b. cash crop farming
   c. livestock raising

Access to Productive Capital
12. Does anyone in your household currently own house?
   1. Yes
   2. No (if No, skip to question 27 )

13. How many houses does your household have?

14. Who would you say owns the house?
   1. Self
   2. Partner / Spouse (Husband)
   3. Jointly owned (Self and Partner / Spouse)
   4. Other Household Member
   5. Self and Other Household Member
   6. Partner / Spouse and Other Household Member
   7. Someone (or group of people) outside the Household
   8. Self and other outside people
   9. Partner / Spouse and other outside people
   10. Self, Partner / Spouse and other outside people

15. Who would you say can decide whether to sell the house?
   1. Self
   2. Partner / Spouse (Husband)
   3. Jointly owned (Self and Partner / Spouse)
   4. Other Household Member
   5. Self and Other Household Member
   6. Partner / Spouse and Other Household Member
   7. Someone (or group of people) outside the Household
   8. Self and other outside people
   9. Partner / Spouse and other outside people
   10. Self, Partner / Spouse and other outside people
16. Who would you say can decide whether to give away the **house**?
   1. Self
   2. Partner / Spouse (Husband)
   3. Jointly owned (Self and Partner / Spouse)
   4. Other Household Member
   5. Self and Other Household Member
   6. Partner / Spouse and Other Household Member
   7. Someone (or group of people) outside the Household
   8. Self and other outside people
   9. Partner / Spouse and other outside people
   10. Self, Partner / Spouse and other outside people

17. Who would you say can decide to mortgage or rent out the **house**?
   1. Self
   2. Partner / Spouse (Husband)
   3. Jointly owned (Self and Partner / Spouse)
   4. Other Household Member
   5. Self and Other Household Member
   6. Partner / Spouse and Other Household Member
   7. Someone (or group of people) outside the Household
   8. Self and other outside people
   9. Partner / Spouse and other outside people
   10. Self, Partner / Spouse and other outside people

18. Who contributes most in decisions of purchasing a new **house**?
   1. Self
   2. Partner / Spouse (Husband)
   3. Jointly owned (Self and Partner / Spouse)
   4. Other Household Member
   5. Self and Other Household Member
   6. Partner / Spouse and Other Household Member
   7. Someone (or group of people) outside the Household
   8. Self and other outside people
   9. Partner / Spouse and other outside people
   10. Self, Partner / Spouse and other outside people

The above 7 questions will be repeated for the following 5 additional items {the bolded phrase will be replaced for each question}:
   a. large consumer durables (fridge, TV, Sofa)
   b. small consumer durables (radio, cookware, gas service)
   c. cellphones
   d. bicycle, motorcycle, car (means of transportation)
   e. residential or commercial land
Access to Credit
19. Has anyone in your household taken any loans or borrowed cash/in-kind from Non-Government Organizations (NGO)?
   1. Yes, Cash
   2. Yes, in-kind
   3. Yes, Cash and in-kind
   4. No
   5. Don’t Know

20. Who made that decision to borrow?
   1. Self
   2. Partner / Spouse (Husband)
   3. Jointly owned (Self and Partner / Spouse)
   4. Other Household Member
   5. Self and Other Household Member
   6. Partner / Spouse and Other Household Member
   7. Someone (or group of people) outside the Household
   8. Self and other outside people
   9. Partner / Spouse and other outside people
   10. Self, Partner / Spouse and other outside people

21. Who makes the decision about what to do with the money / item borrowed from Non-Government Organizations (NGO)?
   1. Self
   2. Partner / Spouse (Husband)
   3. Jointly owned (Self and Partner / Spouse)
   4. Other Household Member
   5. Self and Other Household Member
   6. Partner / Spouse and Other Household Member
   7. Someone (or group of people) outside the Household
   8. Self and other outside people
   9. Partner / Spouse and other outside people
   10. Self, Partner / Spouse and other outside people

The above 3 questions will be repeated for the following 4 additional items {the bolded phrase will be replaced for each question}:
   a. informal lenders
   b. formal lenders (bank / financial institutions)
   c. friends or relatives
   d. group based microfinance or community loans

Individual Leadership and Influence in the Community
22. Do you feel comfortable speaking up in public to help decide on building infrastructure (like small wells, roads, water supplies) in your community, from 1 being not comfortable at all to 5 being extremely comfortable?
23. Do you feel comfortable speaking up in public to ensure proper payment of wages for public employees (like sanitation workers or municipal employees), from 1 being not comfortable at all to 5 being extremely comfortable?

24. Do you feel comfortable speaking up in public to protest the misbehavior of authorities or elected officials (like majors or local politicians), from 1 being not comfortable at all to 5 being extremely comfortable?

**Group Membership and Influence in the Group**

25. Is there a trade or business association related to apparel manufacturing in your community?
   1. Yes
   2. No (if No, skip to next item)

26. Are you an active member of this trade or business association?
   1. Yes
   2. No

The above 2 questions will be repeated for the following 9 additional items {the bolded phrase will be replaced for each question}:

- a. agriculture / livestock / fisheries producers’ or marketing groups
- b. water user’s group
- c. forest user’s group
- d. credit or microfinance group
- e. mutual help or insurance group
- f. civic or charitable group
- g. local government group
- h. religious group
- i. women’s group

**Decision Making**

27. When decisions are made regarding type of apparel factories to choose for employment, who takes that decisions in your household?
   1. Main Male (father, or father in law) or Husband
   2. Main Female (mother or mother in law) or myself
   3. Husband and myself jointly

28. When decisions are made regarding your salary employment, who is it that normally takes the decision?
   1. Main Male or Husband
   2. Main Female or Wife
   3. Husband and Wife jointly

29. When decisions are made regarding type of business activities to follow for the family business / small business, who is it that normally takes the decision?
1. Main Male or Husband
2. Main Female or Wife
3. Husband and Wife jointly

30. When decisions are made regarding type of daily labor jobs to pursue, who is it that normally takes the decision?
   1. Main Male or Husband
   2. Main Female or Wife
   3. Husband and Wife jointly

31. When decisions are made regarding type of cash crop to grow, who is it that normally takes the decision?
   1. Main Male or Husband
   2. Main Female or Wife
   3. Husband and Wife jointly

32. When decisions are made regarding livestock raising, who is it that normally takes the decision?
   1. Main Male or Husband
   2. Main Female or Wife
   3. Husband and Wife jointly

33. When decisions are made regarding major household expenditures (such as a large appliance for the house like fridge), who is it that normally takes the decision?
   1. Main Male or Husband
   2. Main Female or Wife
   3. Husband and Wife jointly

34. When decisions are made regarding minor household expenditures (such as a food for daily consumption or other household needs), who is it that normally takes the decision?
   1. Main Male or Husband
   2. Main Female or Wife
   3. Husband and Wife jointly

[Ask the following questions (34-41) only if the response is a for Question 26-33]

Please answer the following questions (34-41) from 1 being extremely uncomfortable to 5 being extremely comfortable.

35. To what extent do you feel that you can make your own decision regarding the type of the job you want to have, if you wanted to?

36. To what extent do you feel that you can make your personal decisions regarding your wage or salary employment, if you wanted to?
37. To what extent do you feel that you can make your personal decisions regarding type of business activities to follow for the family business / small business, if you wanted to?

38. To what extent do you feel that you can make your personal decisions regarding type of daily labor jobs to pursue, if you wanted to?

39. To what extent do you feel that you can make your personal decisions regarding type of cash crop to grow, if you wanted to?

40. To what extent do you feel that you can make your personal decisions regarding livestock raising, if you wanted to?

41. To what extent do you feel that you can make your personal decisions regarding major household expenditures (such as a large appliance for the house like fridge), if you wanted to?

42. To what extent do you feel that you can make your personal decisions regarding minor household expenditures (such as a food for daily consumption or other household needs)?

Motivation for Decision Making (for those who say a for question 26-33)
Please response from 1 being always true to 5 being never true.

43. My response to making decisions about the type of jobs that I want to have is partly because I know I will get into trouble with someone if I act differently.

44. My response to making decisions about the type of jobs that I have is partly because I don’t want others to think poorly of me.

45. My response to making decisions about the type of jobs that I have is partly because I personally think it is the right thing to do.

The above 3 questions will be repeated for the following 9 additional items {the bolded phrase will be replaced for each question}:
   a. my wage or salary employment
   b. getting input for type of business activities to follow for the family business / small business
   c. getting input for type of daily labor jobs to pursue

Time Allocation
Please recall the activities that you performed in the last 24 hours (starting yesterday morning at 4 am, finishing 3:59 am of the current day). The time intervals are marked
in 30 minutes intervals and one to two activities can be marked for each time period by drawing a line through that activity. If two activities are marked, they should be distinguished with a P for the primary activity and S for the secondary activity written next to the lines.

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<th>Activity</th>
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**Satisfaction with Time Allocation**

46. How satisfied are you with your available time for leisure activities like visiting neighbors, watching TV, listening to the radio, seeing movies or doing sports, from 1 being extremely not satisfied to 5 being extremely satisfied?
APPENDIX B: ITEM NUMBERS AND SURVEY QUESTIONS
<table>
<thead>
<tr>
<th>Dimension</th>
<th>Indicator</th>
<th>Item numbers</th>
<th>Survey Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Production</strong></td>
<td>Input in Productive decisions</td>
<td>I1</td>
<td>How much input did you have in making decisions about: salaried employment in apparel factories, family business, cash crop and livestock raising</td>
</tr>
<tr>
<td></td>
<td>I2</td>
<td></td>
<td>To what extent do you feel you can make your own personal decisions regarding these aspects of household life if you want(ed) to: salaried employment in apparel factories</td>
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<td></td>
<td>I3</td>
<td></td>
<td>To what extent do you feel you can make your own personal decisions regarding these aspects of household life if you want(ed) to: family business, cash crop and livestock raising</td>
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<td></td>
<td>A1</td>
<td></td>
<td>when decisions are made regarding job selection who makes the decision?</td>
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<td>A2</td>
<td></td>
<td>when decisions are made regarding household expenditures who makes the decision?</td>
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<td>A3</td>
<td></td>
<td>Regarding type of apparel jobs to select, I do what I do so others don’t think poorly of me.</td>
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<td>A4</td>
<td></td>
<td>Regarding type of apparel jobs, I do what I do because I personally think it is the right thing to do</td>
</tr>
<tr>
<td><strong>Ownership of Assets</strong></td>
<td>O1</td>
<td></td>
<td>Who would you say owns the House</td>
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<tr>
<td></td>
<td>O2</td>
<td></td>
<td>Who would you say owns household consumer durables</td>
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<td>O3</td>
<td></td>
<td>Who would you say owns cellphones, transport vehicles</td>
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<td>O4</td>
<td></td>
<td>Who would you say owns commercial, agricultural, residential land</td>
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<tr>
<td><strong>Resources</strong></td>
<td>Purchase, Sell and Transfer of Assets</td>
<td>P1</td>
<td>Who would you say can decide whether to sell household items, most of the time?</td>
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<td>P2</td>
<td>Who would you say can decide whether to rent / mortgage household item most of the time?</td>
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<td>P3</td>
<td>Who would you say can decide whether to give away household item most of the time?</td>
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<td>P4</td>
<td>Who contributes most to decisions regarding a new purchase of household items?</td>
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<td><strong>Access to Credit</strong></td>
<td>C1</td>
<td></td>
<td>Who made the decision to borrow? Non-governmental organization (NGO); Formal lender (bank); Friends or relatives;</td>
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<td>C2</td>
<td></td>
<td>Who made the decision to borrow? Informal lender; Friends or relatives;</td>
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<td></td>
<td>C3</td>
<td></td>
<td>Who made the decision about what to do with money/item borrowed?</td>
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<td>Income</td>
<td>Control over Use of Income</td>
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<tr>
<td>IN1</td>
<td>How much input did you have in decisions on the use of income generated from productive activities?</td>
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<td>IN2</td>
<td>To what extent do you feel you can make your own personal decisions regarding these aspects of household life if you want(ed) to: Your own wage or salary employment? Minor household expenditures?</td>
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<tr>
<td>IN3</td>
<td>To what extent do you feel you can make your own personal decisions regarding these aspects of household life if you want(ed) to: family business, cash crop and livestock raising</td>
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<thead>
<tr>
<th>Leadership</th>
<th>Group Membership</th>
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<tr>
<td>G1</td>
<td>Do you or have you ever had a leadership position in the Group?</td>
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<tr>
<td>G2</td>
<td>How much input do you have in making decisions in the Group?</td>
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<thead>
<tr>
<th>Leadership</th>
<th>Speaking in Public</th>
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<tbody>
<tr>
<td>S1</td>
<td>Do you feel comfortable speaking up in public: To intervene in case of a family dispute? To protest the misbehavior of authorities or elected officials?</td>
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<tr>
<td>S2</td>
<td>Do you feel comfortable speaking up in public: To ensure proper payment of wages for public work or other similar programs? To help decide on infrastructure (like wells, roads) to be built?</td>
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<tr>
<th>Time</th>
<th>Workload</th>
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<tbody>
<tr>
<td>W1</td>
<td>Total number of hours worked in previous 24 hours.</td>
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<tr>
<td>W2</td>
<td>Worked more than 10.5 hours in previous 24 hours.</td>
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<tr>
<th>Time</th>
<th>Leisure</th>
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<tr>
<td>L1</td>
<td>How would you rate your satisfaction with your available time for leisure activities like, watching TV, listening to radio, seeing movies, doing sports, visiting neighbors?</td>
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<tr>
<td>L2</td>
<td>Spent more than 5 hours in leisure activities in the previous 24 hours.</td>
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APPENDIX C: LIST OF EQUATIONS
• \( \text{WEAI} = 0.8(5DE) + 0.2(\text{GPI}) \) ----------------------------------------Eqn (1)

\[
M_0 = \mu(c(k)) = \frac{1}{n} \sum_{i=1}^{n} c_i(k)
\]

------------------------------Eqn (2)

• If \( \text{IPD} > 1 \), respondents in non-farming households have adequate level of input in productive resource decisions

Otherwise respondents in non-farming households have inadequate level of input in productive resource decisions --------------------------------Eqn(3)

• If \( \text{AI} \geq 1 \), a woman in non-farming household has autonomy in the productive decisions in the different household activities,

Otherwise a woman in non-farming household is considered to not have autonomy in the productive decisions in the different household activities------------------Eqn(4)

• If \( \text{OWN} > 1 \), respondents in non-farming households have adequate access to ownership of major household assets

Otherwise respondents in non-farming households have inadequate access to ownership of assets --------------------------------Eqn (5)

• If \( \text{PST} > 0 \), respondents in non-farming households have adequate access to purchase, sale or transfer of assets

Otherwise respondents in non-farming households have adequate access to purchase, sale or transfer of assets --------------------------------Eqn(6)

• If \( \text{ACT} > 0 \), respondents in non-farming households have adequate access to credit

Otherwise respondents in non-farming households have inadequate access to credit --------

----------------------------------------Eqn (7)
• If \( COI \geq 2 \), a woman in non-farming household has control over use of income for the different household activities,
Otherwise a woman in non-farming household is considered to not have the control to use income for different household activities \( \text{---------Eqn (8)} \)

• If \(GRP \geq 1\), an individual in non-farming household has adequate group membership,
Otherwise an individual in non-farming household has inadequate group membership \( \text{---------Eqn (9)} \)

• If \( SPUB \geq 2\), an individual from non-farming household is adequately comfortable in speaking up in public
Otherwise an individual from non-farming household is not adequately comfortable in speaking up in public \( \text{---------Eqn (10)} \)

• If workload \( \leq 10.8 \) hours, an individual is considered to have adequate workload
Otherwise an individual is considered to have inadequate workload \( \text{---------Eqn (11)} \)

• If leisure \( \geq 5\), an individual from non-farming household has adequate leisure time
Otherwise an individual from non-farming household does not have adequate leisure time \( \text{---------Eqn (12)} \)

\[
H_{GPI} = \frac{h}{m} \text{---------Eqn (13)}
\]

\[
I_{GPI} = \frac{1}{h} \sum_{j=1}^{h} \frac{ct_j(k)^W - ct_j(k)^M}{1 - ct_j(k)^M} \text{---------Eqn (14)}
\]

\[
GPI = 1 - (H_{GPI} \times I_{GPI}) \text{---------Eqn (15)}
\]

\[
SDE = H_p \times A_p \text{---------Eqn (16)}
\]
APPENDIX D: INSTITUTIONAL REVIEW BOARD APPROVAL, CONSENT LETTERS AND ADVERTISMENT SCRIPT
April 20, 2016

Principal Investigator: Debanjan Das
Department: Textile and Apparel Mgmt

Your Exempt Application to project entitled Development of Women Empowerment index for the Indian apparel industry was reviewed and approved by the MU Institutional Review Board according to the terms and conditions described below:

IRB Project Number 2005472
IRB Review Number 214883
Initial Application Approval Date April 20, 2016
IRB Expiration Date April 20, 2017
Level of Review Exempt
Project Status Active - Open to Enrollment
Exempt Categories 45 CFR 46.101b(2)
Risk Level Minimal Risk
Internal Funding Personal funds

The principal investigator (PI) is responsible for all aspects and conduct of this study. The PI must comply with the following conditions of the approval:

1. No subjects may be involved in any study procedure prior to the IRB approval date or after the expiration date.
2. All unanticipated problems, adverse events, and deviations must be reported to the IRB within 5 days.
3. All changes must be IRB approved prior to implementation unless they are intended to reduce immediate risk.
4. All recruitment materials and methods must be approved by the IRB prior to being used.
5. The Annual Exempt Form must be submitted to the IRB for review and approval at least 30 days prior to the project expiration date. If the study is complete, the Completion/Withdrawal Form may be submitted in lieu of the Annual Exempt Form.
6. Maintain all research records for a period of seven years from the project completion date.
7. Utilize all approved research documents located within the attached files section of eCompliance. These documents are highlighted green.

If you are offering subject payments and would like more information about research participant
Consent to act as a Human Participant

**Project Title:** Development of Women Empowerment Index for the Indian Apparel Industry  
**Project Director:** Debanjan Das  
**Advisor:** Dr. Jung Ha-Brookshire, Associate Professor, Department of Textile and Apparel Management  

**DESCRIPTION AND EXPLANATION OF PROCEDURES:**  
The primary goal of this research is to measure the empowerment of female apparel laborer’s working in the apparel industry. To address this goal, interview will be conducted which should take approximately 30 to 45 minutes.  
Your participation in this research is totally voluntary. If you agreed to be part of this study a face to face interview will be conducted. The subjects’ names will not be collected to ensure privacy.  

**CONFIDENTIALITY:**  
Data will be saved and kept strictly confidential. Any electronic files will be saved with numeric codes, with no personal identifiers. Throughout the procedures, if you feel uncomfortable with any questions or experiences, you may stop participation at any time. Finally, only the researcher will have access to the data and the aggregated data will be analyzed and shared for publication to protect your confidentiality. The data will be kept for seven years after the study has been completed.  

**RISKS AND DISCOMFORTS:**  
It is anticipated that there are NO physical, psychological or sociological risks involved in participating in this study.  

**BENEFITS TO SOCIETY:**  
The results of this study will benefit society and industry by providing the specific knowledge about the women empowerment of Indian apparel female workers. The results would also help future employees learn about the domains and indicators that affects empowerment.  

**COMPENSATION/INCENTIVES:**  
There is no direct compensation or incentive for your participation in this study.  

**CONSENT:**  
You are free to refuse to participate or to withdraw your consent to participate in this research at any time without penalty or prejudice; your participation is entirely voluntary. Your privacy will be protected because you will not be identified by name as a participant in this project. Your privacy will be protected as all the information in your journals will be kept strictly confidential. If you have any questions concerning your rights as a participant, you may contact Campus Institutional Review Board at 001-573-882-9585. If you have any questions regarding the research itself, you may contact me at 001-573-825-2501 or by e-mail at debanjandas@mail.missouri.edu.  
Thank you in advance for your assistance and time. Please keep this consent form with you for future references.
மலிகம் விளம்பு அறிவியல் கல்விக்கைகளைத்
குற்ற பரப்புவல் நிறுவன அளவு நுண்ணறு கல்விக்கைகளை கொண்டார்.

நிறுவனம்: Debanjan Das
அவர்கள்: Dr. Jung Ha-Brookshire, பிறக்க விளம்பியார்.

வருங்காள் புரோச்சா விளக்கம்:
ஒல்காதல் இந்தப் பதினி, பெயர் குறித்து 20 மேனு 30
பதினி வழியில் இரண்டுபடி ஏற்படுகின்றது
இந்த துணைப்பதினி இன்னும் பாதுகாப்பு நல்லாகவே இருக்கிறது. இந்த அளவில் இரு
இல்லை அத்துடன் பெயர் தொடர்கை விளம்பிக்கப்படுகின்றது.

காவியம்:
தற்கு வெளிப்படுத்திய வரும கல்விப்பாடி பார்க்கிற கல்விக்கை
இனார் விளம்பிக்கப்பட்டது. இதுவே எவர் நூறு அனைத்து அவர்களைக்
ஆராட்டித்த முறையிலும், குறிப்பிட்டு விளக்கத்தில் பாதுகாப்பு இருக்கிறது விளம்பிக்கப்பட்டு விளம்பிக்கப்பட்டு
இருக்கிறது. இதனால் பொருள் போட்ட நோய் அவர்களின் கல்விக்கை.

அமைப்பாளர் முறை புரோச்சாக்கள்:

என்ன இல்லை, என்ன வெளிப்ப ஆண்டு குடும்பவர் அமைப்பாளர் இந்திய நாட்டில் கூடிய கூடிய கூடிய.

நிறைவு:

ஆண்டவர் பார் கூடிய கூடிய கூடிய பார் ஆண்டு கூடியா.

நோக்கம்:

இந்த அளவில் இன்று பாதுகாப்பு தேர்வித்து அவர்கள் கூடிய கூடிய.

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நேரடையான தொடர்பு

ஒலிக்கும் ஆலோசனை அளிக்கும் தொடர்புகள் வளர்க்கும் விளைவில் எதிர்த்துத்தீவு என்று ஒலிக்கும் ஆலோசனை கருத்தில் பாதுகாப்பு விளைவில் பாதுகாப்பு நூல்வலன்; கூட்டத் தொடர்பு முறையில் தொடர்பாகும். கூட்டத் தொடர்பில் தொடர்பு விளைவில் பாதுகாப்பு அள்ளப்பட்டும் கூட்டத் தொடர்பு நூல்வலன் செய்யீரும் விளைவில் குறுக்கும் செய்யுடன் தொடர்பாகும், தொடர்பு 001-573-882-9585

மூலம் பாதுகாப்பு விளைவில் குறுக்கும் செய்யுடன் தொடர்பாகும், தொடர்பு 001-573-529-7710 ஆலோசனை

விளையாடும் தொடர்பு நூல்வலன் விளையாடும் தொடர்பு விளையாடும் தொடர்பு
Research Participants Wanted for Women Labor Research
International researchers from a USA University are looking for participants for a study on women labor. If you are 18 years old or older, have worked in the apparel industry for more than 12 months and have 30 minutes of time for this research, please contact at +91 80156151869 for more information.

Tamil

இந்துவுலகத் கற்றுண்டு:
ஒரு காரணத்தை அல்லது அழகு பட்டாலேயே தீர்வும் செய்யவும் ஆண்டு விளக்கத்தில் ஒரு காரணத்தை அளிப்பிலோ தீர்வு பட்டாலேயே தீர்வும்; ஆண்டு பால்காலின் விளக்கத்தில் ஒரு காரணம் அமையவும் விளக்கத்தில் பால்காலின் விளக்கத்தில் ஒரு காரணம் அமையவும் விளக்கத்தில் பால்காலின் விளக்கத்தில் ஒரு காரணம், நேர்காலை உணவு மறைந்து விளக்கத்தில் ஒரு காரணம், நேர்காலை உணவு மறைந்து விளக்கத்தில் ஒரு காரணம், நேர்காலை +91 80156151869 அமைவு

இவ்வாறு. நேர்காலை உணவு மறைந்து விளக்கத்தில் ஒரு காரணம் அமைவு.
My name is Debanjan Das and I am a doctoral candidate in the University of Missouri, USA. I am currently researching on the domains and indicators that impact women empowerment and your assistance in participating in a half hour face to face survey interview would be extremely valuable for this research. Your participation in this research is voluntary. Your privacy will be protected as all the information in the interview will be kept strictly confidential. If you have any questions concerning your rights as a participant, you may contact Campus Institutional Review Board at 573-882-9585. If you have any questions regarding the research itself, you may contact me at 573-529-7710 or by e-mail at ddmq3@missouri.edu. Thank you in advance for your assistance and time.

Tamil

இன்னை தமிழ் எழுதிய அறிக்கைகளில்:

என்னுடைய அம்சத்தில் அம்சமே பாரப்பும் கிளையற்ற நூற்றுக்கிழக்கு ஏற்றுக்கான செயற்கையும் எந்த பரம்பரை அதனில் சரி பிடி பிடித்து மறுப்புச் செய்யும்; லாக்ரே பாண்டு முறையிலான வல்லானால். தியாத இயல்நில்லானூ துறை தரும் விளக்கம் அடங்காமல் விளக்கானவில்லாமல் தொடரியில் கூறிச் செய்துள்ளீர்கள் என்றும், தமிழ் 001-573-882-9585 வல்லாக்க புது தொடரும் கூறிச் செய்துள்ளீர்கள், தமிழ் 001-573-529-7710 எந்த நோயாப் பதிக்காமா.

இவை நோகை. நேரடைச் செய்ப்படால் எந்தகையும் டிரைவ செய்ப்படாமல் தோன்றாக்கிகள்.
APPENDIX E: SEM DIAGRAM
Debanjan Das, Ph.D. completed her masters from MU in 2013 together with a graduate certificate in Center for Digital Globe. His research looks into women empowerment issues in the Indian Apparel Industry. His research program also investigates how the labor force participation of married women in the Indian apparel manufacturing industry impacts family development and women empowerment. His areas of research include labor economics, international trade policies and organizational structure analysis. While a doctoral student, he was a graduate instructor at MU, teaching Softgoods Retailing. He has recently taken up a position as Assistant Professor at West Virginia University. Debanjan also has two years’ work experience in Indian apparel industry, working for clients such as Diesel, Calvin Klein, Timberland, Tommy Hilfiger and Tom Tailor. He can be reached at debanjandas@mail.missouri.edu.