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Oxford Department of International Development
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Oxford Poverty & Human Development Initiative (OPHI), Oxford Department of International Development, Queen Elizabeth House (QEH), University of Oxford, 3 Mansfield Road, Oxford OX1 3TB, UK
Tel. +44 (0)1865 271915, Fax +44 (0)1865 281801, ophi@qeh.ox.ac.uk, http://www.ophi.org.uk

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The Women's Empowerment in Agriculture Index

Sabina Alkire, Ruth Meinzen-Dick, Amber Peterman, Agnes Quisumbing, Greg Seymour, and Ana Vaz[1]

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[1] Authorship is alphabetical.

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1. Introduction

Empowering women and reducing gender inequalities are two key objectives of development policy. The third Millennium Development Goal (MDG3), adopted as part of the United Nations Millennium Declaration in 2000, explicitly aims to promote gender equality and empower women. These are not only goals in themselves but have also been shown to contribute to improving productivity and increasing efficiency. For example, the FAO's State of Food and Agriculture 2010–2011, *Women in Agriculture: Closing the Gender Gap for Development*, states that closing the gender gap in agriculture is essential to increasing agricultural productivity, achieving food security and reducing hunger. The World Bank's 2012 World Development Report, *Gender Equality and Development*, reinforces this message and identifies the significant effects of women's empowerment on the efficiency and welfare outcomes of project or policy interventions. The motivations for empowering women are not mutually exclusive: rather, they reinforce each other. Closing the gender gap in assets – allowing women to own and control productive assets – both increases their productivity and increases self-esteem. A woman who is empowered to make decisions regarding what to plant and what (and how many) inputs to apply on her plot will be more productive in agriculture. An empowered woman will also be better able to assure her children's health and nutrition, in no small part because she is able to take care of her own physical and mental well-being (see Smith et al. 2003 and studies reviewed therein).

What measures can be used to track progress on these goals? Women's empowerment and gender inequality are typically measured at an aggregate country-level which does not allow for heterogeneities between regions, socioeconomic status, marital status, age or ethnicities. The indicators proposed for tracking MDG3 (ratios of girls to boys in primary, secondary and tertiary education; the share of women in wage employment in the non-agricultural sector; and the proportion of seats held by women in national parliament), while useful for characterizing progress toward gender equality, are proxy or indirect indicators and thus do not provide direct measures of empowerment as experienced by individuals. The Gender Gap Index (Hausmann, Tyson, Zahidi 2011, and previous years), while covering gender inequalities in a broader set of domains (education, health, economic opportunity and political opportunity), is based on aggregate indicators and, similar to the MDG3 indicators, does not provide a direct measure of empowerment. Nationally representative surveys such as some Demographic and Health Surveys (DHS) include a range of questions on decision making, such as who decides on the use of woman-earned income and who within the family has the final say on a range of decisions (for example, decisions on the woman's own health care, large and daily household purchases, visits to family or relatives and what food should be cooked each day). While the DHS surveys provide a direct measure of decision making within the household, the domains over which decision making is measured are typically confined to the household and domestic sphere. Therefore, these questions do not adequately cover other dimensions of a woman's life, particularly decisions in the productive and economic spheres. Nor do they consider measures of empowerment other than intra-household allocation of decision-making powers. Such measures of empowerment are limited in several ways (Alkire 2005, Narayan-Parker 2005, Alsop et al. 2006, Kishor and Subaiya 2008).

There is renewed interest in the agricultural sector as an engine of growth and development, and greater recognition of the importance of women in agriculture. However, without tools for measuring the impact of agricultural interventions on women's empowerment, the impacts of programs on empowerment (or disempowerment) are likely to receive much less attention than income or other more measurable outcomes. Therefore, there is a need for measures of empowerment that are robust, inclusive and comparable over time and space. Indices that capture many different dimensions provide a summary measure that allows for comparability. Because most indexes and indicators used in monitoring development progress on gender equity have very little coverage of the agricultural sector, while many agriculture-related indicators are gender-blind, there is a clear need for a tool to measure and monitor the

impact of agricultural interventions on empowerment of women within the agricultural sector (Kishor and Subaiya 2008; Malhotra and Schuler 2005). As noted by Secretary of State Hillary Clinton (2012), "Data not only measures progress, it inspires it. …what gets measured gets done. Once you start measuring problems, people are more inclined to take action to fix them because nobody wants to end up at the bottom of a list of rankings."

The Women's Empowerment in Agriculture Index (WEAI) is a new survey-based index designed to measure the empowerment, agency and inclusion of women in the agricultural sector. The WEAI was initially developed as a tool to measure the greater inclusion of women that may result from broad-based agricultural growth. It was designed to reflect women's empowerment that may result from the US Government's Feed the Future Initiative, which commissioned the development of the WEAI. Yet the WEAI can also be used more generally by other organizations to assess the state of empowerment and gender parity in agriculture, to identify key areas in which empowerment needs to be strengthened and to track progress over time.

The WEAI builds on recent research to develop indicators of agency and empowerment (e.g., Narayan 2005, Alsop et al. 2006, Ibrahim and Alkire 2007) that has proposed domain-specific measures of empowerment obtained using questions that can be fielded in individual or household surveys. Based on the Alkire-Foster (2011) methodology, the WEAI is an aggregate index, reported at the country or regional level, based on individual-level data collected by interviewing men and women within the same households. The WEAI comprises two sub-indexes. The first assesses the degree to which women are empowered in five domains of empowerment (5DE) in agriculture. It also takes into account the percentage of individual domains in which women are empowered among those who do not meet the combined empowerment threshold.[2] These domains are: (1) decisions over agricultural production, (2) access to and decision-making power over productive resources, (3) control over use of income, (4) leadership in the community, and (5) time allocation. The second sub-index measures gender parity (the Gender Parity Index, GPI). The GPI reflects the percentage of women who are as equally empowered as the men in their households. For those households that have not achieved gender parity, the GPI shows the empowerment gap that needs to be closed for women to reach the same level of empowerment as men.

This technical paper was written by researchers from the International Food Policy Research Institute (IFPRI) and the Oxford Poverty and Human Development Initiative (OPHI) to document the piloting and development of the WEAI, so that researchers and practitioners seeking to use the index in their own work will understand how the survey questionnaires were developed and piloted, how the qualitative case studies were undertaken, how the index was constructed, how various indicators were validated and how it can be used in other settings. The index evolved in late 2010 and early 2011 out of discussions among US government agencies involved in the Feed the Future Initiative regarding the need for an indicator to monitor women's empowerment. The discussions initially revolved around using a 'gender perceptions index' but eventually focused on an index similar to the multidimensional poverty indices being developed by OPHI. Following the definition of the five domains of empowerment in agriculture by USAID, work began at IFPRI in June–July 2011 to develop questionnaire modules that could be used to elicit responses on each of these domains. The full survey – with household and individual questionnaires, administered to a primary male and a primary female respondent in each household[3] – was

[2] "Empowerment" within a domain means that the person has adequate achievements or has "achieved adequacy" (i.e. surpasses a threshold) for that domain.

[3] This index purposely does not use the concept of "male-headed" or "female-headed" households, which are fraught with difficulties and assumptions about "headship" (see Buvinić and Rao Gupta 1997). Rather, we classify households in terms of whether there are both male and female adults (dual adult households), only female adults, or

piloted from September to November 2011 in Feed the Future "zones of influence" in Bangladesh, Guatemala and Uganda. Index development took place from November 2011 to January 2012. Qualitative interviews and case studies with individuals, as well as a technical consultation with outside experts in January 2012, provided further input into the choice of indicators that comprise the index. The WEAI itself was launched on February 28, 2012, at the 56th Session of the Committee on the Status of Women at the United Nations, New York, and subsequently in three separate presentations in March in London, New Delhi and Washington, DC.

This paper is organized as follows. Section 2 reviews the literature on measuring women's empowerment in agriculture, the definition of the five domains of empowerment in agriculture and the rationale for measuring intra-household gender equality. Section 3 discusses the concept of multidimensional indices and the Alkire-Foster method. Sections 4 and 5 discuss the development of the survey questionnaire and the case studies and field implementation. Section 6 presents statistical analysis (correlation analysis and validity tests) of the raw data. Section 7 provides details on the indicators used for the five Domains of Empowerment WEAI, how they are constructed as well as the cutoffs that are set. Section 8 goes into more detail on the properties of the index, its computation and its interpretation. Section 9 presents the results of the pilot studies. Section 10 examines the relationship between the index and other correlates of empowerment (wealth, education, household structure, household food security and other measures of empowerment). Sections 11 and 12 discuss intra-household patterns of empowerment and the way forward.

2. Measuring women's empowerment in agriculture

2.1 Defining and measuring empowerment

Because the concept of empowerment is so personal, each person has a unique definition of what it means to be empowered based on their life experiences, personality and aspirations. For example, drawing on the qualitative case studies collected in each pilot country, a 39-year old Guatemalan woman defines an empowered person as "…someone who has the power to decide – to say, if they have land, 'Well, I can go farm, I can grow crops, I can plant seeds' – or if they have animals, to say 'I can sell them without going to ask permission.' This is a person who has the power to decide about their things, their life, their actions." A Ugandan man, age 46, says: "People who are empowered 'see change in their lives'."

Naturally, context and culture also shape one's definition of empowerment. In Uganda, women interviewed in the qualitative case studies related empowerment as the ability to improve quality of life, whether fiscally or in relation to autonomy, or as decision-making capacity, and defined empowerment as "someone who is independent." Women in Guatemala generally defined empowerment as "decision-making capability" and "equality" with men. For example, a 63-year-old woman said: "Being empowered, it means that the woman can do things too, not just the man." Women in Bangladesh see empowerment more narrowly related to their financial position, as directly resulting from "having money" and assets, as well as *cooperatively* "succeeding" at work. In Bangladesh, individuals cite a communal, rather than singular, understanding of empowerment focused on the family unit rather than the individual women or man – which includes the ability to work jointly and well together. Therefore, doing work and income-generating activities successfully empowers not just an individual but rather an entire family (Becker 2012).

Reflecting the multiple experiences and views of empowerment, there are many definitions of

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only male adults. Because the latter are very rarely found in our study areas, our sample and analysis compare dual-adult and female-only households.

empowerment in the literature (see Ibrahim and Alkire 2007 for a comprehensive review). Three definitions that are commonly cited are found in Kabeer (2001), Alsop (2006) and Narayan (2002). Kabeer (2001) defines empowerment as expanding people's ability to make strategic life choices, particularly in contexts where this ability had been denied to them. Alsop (2006) describes empowerment as "a group's or individual's capacity to make effective choices, that is, to make choices and then to transform those choices into desired actions and outcomes." This definition has two components – the component related to Amartya Sen's concept of agency (the ability to act on behalf of what you value and have reason to value) – and the component related to the institutional environment, which offers people the ability to exert agency fruitfully (Ibrahim and Alkire 2007). Narayan (2002) defines empowerment as "the expansion of assets and capabilities of poor people to participate in, negotiate with, influence, control, and hold accountable institutions that affect their lives," stressing four main elements of empowerment: access to information, inclusion and participation, accountability and local organizational capacity. A focus on individual choice can limit the definition of empowerment, especially in cultural contexts where community and mutuality are valued. Both Kabeer and Alsop also include agency and capacity – the ability to act on one's choices. Narayan's definition is broader, as it includes the relationship between people and institutions. Mahmud, Shah, and Becker (2012) note that a crucial element of empowerment relates to access to and control of material, human and social resources. In defining empowerment in agriculture, it is important to consider the ability to make decisions as well as the material and social resources needed to carry those decisions out. In addition, although women's empowerment is a multidimensional process that draws from and affects many aspects of life, including family relationships, social standing, physical and emotional health, as well as economic power, the focus of the WEAI is on those aspects of empowerment that relate directly to agriculture – an area that has been relatively neglected in studies of empowerment.

2.2 Choosing indicators for measuring empowerment

In choosing indicators for measuring empowerment, a number of issues need to be addressed:[4]

Direct or indirect. Direct measures of empowerment generally focus on the expansion of an individual's ability to advance the goals and ends he or she values, rather than acting solely to avoid social condemnation or direct coercion. *Indirect*, or proxy, measures of empowerment traditionally focus on the possession of resources necessary for empowerment or the determinants of being empowered, such as education or asset ownership, rather than on empowerment itself. Thus, women's decision-making power over assets in the WEAI is a more direct measure of empowerment, while indicators of the size of the asset bundle, for example, would be indirect measures of empowerment. While we would like to measure empowerment as directly as possible, it will be vital for policy to examine how direct measures of empowerment are affected by various determinants. Both goals are advanced by constructing a measure that reflects empowerment as directly as possible and subsequently analyzing its determinants.

Intrinsic or extrinsic: Do we measure the empowerment that people value or the powers that they have – even if they do not value these powers? The questions on personal decision making over agricultural production assets and use of discretionary income in the WEAI relate to the power that the respondent actually has. However, the questions on relative autonomy in production, which are patterned after Ryan and Deci (2000, 2011; Ryan 2012), capture the agency that the respondent values. To further capture intrinsic concepts, the quantitative survey used to construct the WEAI was followed by qualitative case studies that sought to elicit definitions of empowerment from men and women themselves.

Universal or context-specific: Empowerment is inherently context specific: it is shaped by socioeconomic, cultural and political conditions, which can make comparison across countries

[4]This discussion draws heavily on Ibrahim and Alkire (2007).

problematic (Malhotra et al. 2005). In order to measure and track changes in empowerment in the initial 19 countries of the Feed the Future Initiative, researchers must use indicators that can be compared across contexts and across time. Although it is valid to ask whether meaningful international indicators of empowerment exist, the development and piloting of the WEAI has been a step towards the construction of such comparable indicators that are also valid in local contexts. Most of the individual-level direct indicators of empowerment included in the pilot survey, as well as a few of the household-level indicators, are based, in varying degrees, on the empowerment indicators recommended by Ibrahim and Alkire (2007). These recommendations are the result of an extensive review of hundreds of indicators used to measure empowerment in more than 30 recent cross-country studies conducted by researchers in the fields of economics, sociology and psychology and were based on several criteria, most notably international comparability.[5] In devising indicators regarding control of productive resources, the WEAI uses general lists of assets, agricultural activities and expenditure categories, although these lists are modified to be relevant to the local context when implemented in different countries. For example, the survey in Bangladesh asked about aquaculture activities, which are not prevalent in Uganda or Guatemala.

Level of application: While indicators of empowerment may be measured at the household, group, community and national level, this study focuses on the individual level. In particular, because we are also interested in measuring the empowerment of women relative to men within the same household, the WEAI collects indicators of empowerment for a primary male and a primary female in dual-adult households.

Individual or collective: Can group agency be measured using individual data? Depending on sampling strategy, it may be possible to infer group agency from individual data (see Ibrahim and Alkire 2007). For example, one can obtain measures of the individual woman's agency within the group(s) to which she belongs, such as a producer's organization, but unless the group is also considered one of the stratification units for sampling, we may not be able to infer whether the group itself is empowered.

Who measures: self or others? Empowerment has objective and subjective dimensions (Holland and Brook 2004, p. 1, cited in Ibrahim and Alkire 2007). However, some researchers question the validity of self-reported indicators, since they may be subject to biases due to adaptive preferences, the frame of reference, mood, the sequence of the questionnaire, the presence of other household members during the interview or information available to the respondent. On the other hand, because empowerment is such an individually located concept, not using self-reported indicators may undermine the entire measurement exercise. The WEAI survey includes both objective as well as self-reported indicators. An objective indicator would be, for example, membership in groups; a related self-reported indicator would be whether the individual is comfortable speaking in public.

Quantitative or qualitative: The WEAI is constructed using quantitative data. However, the survey

[5] The international comparability of many indicators in the pilot survey is unambiguous (Seymour 2011). For example, the household-level modules are almost entirely composed of standard household survey questions and include many indicators that closely mirror individual-level indicators. These household-level indicators were included in the pilot largely for validation purposes, i.e., to test whether or not the evaluation of empowerment changes depending on how or to whom the question is posed, or to examine whether responses to questions are influenced by household attributes such as wealth, but are not included in the WEAI itself. We recommend that these indicators, even if not used in the WEAI itself, be included for validation purposes (e.g., to assess whether or not the respondent should be asked questions pertaining to a particular asset) and for the analysis of covariates.

instruments and overall WEAI analyses have been validated and contextualized using qualitative case studies to explore the concepts of empowerment, particularly with respect to the 5DE. From previous experience with the Multidimensional Poverty Index (MPI) (Alkire and Santos 2010) and now with the WEAI, it has been found that qualitative case studies are important in capturing what people experience in their own words and understanding what empowerment means within different contexts.

2.3 Measuring empowerment in agriculture: the five domains of empowerment in agriculture

The early literature on empowerment typically used one "global" measure for empowerment. For example, parents' education was often used to measure agency or decision making within the household (Alkire 2007). However, it is possible that agency differs across different spheres of life and can exist simultaneously in very different ways. For example, a person can be fully employed as a wife and mother, but excluded from the labor force by social conventions and recently empowered to vote by the political process. Because such distinctions have policy relevance, it is important to identify and compare agency achievements in different domains rather in one alone (Alkire 2007, p. 166). Because agency and empowerment are experienced with respect to different tasks and can be described and measured with respect to different domains, Alkire (2005) suggests that most measures of agency and empowerment should be *domain-specific*. For the WEAI, USAID defined the five dimensions of empowerment, based on their priorities for Feed the Future programming in 19 focus countries, as follows:

1. **Production**: This dimension concerns decisions about agricultural production and refers to sole or joint decision making about food and cash-crop farming, livestock and fisheries, as well as autonomy in agricultural production;
2. **Resources**: This dimension concerns ownership, access to, and decision-making power over productive resources such as land, livestock, agricultural equipment, consumer durables and credit;
3. **Income**: This dimension concerns sole or joint control over the use of income and expenditures;
4. **Leadership**: This dimension concerns leadership in the community, here measured by membership in economic or social groups and comfort in speaking in public;
5. **Time**: This dimension concerns the allocation of time to productive and domestic tasks and satisfaction with the available time for leisure activities.

The first domain follows directly from Kabeer (2001) or Alsop's (2006) definitions of empowerment as the ability to make choices, in this case in key areas of agricultural production. The resource domain reflects control over assets that enable one to act on those decisions. For example, a woman may decide to plant trees, but if she does not have rights over 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 decides how to use it. 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 in many cases even where women produce crops or livestock, they are marketed by men who then keep most of the income. The leadership domain captures key aspects of inclusion and participation, accountability and local organizational capacity, which Narayan (2002) cites as key elements of empowerment. Finally, time, like income, reflects the ability of women to enjoy the benefits from agricultural production. 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. Thus agricultural innovations that greatly increase labor burdens may have a negative effect, even if incomes increase, whereas labor-saving technologies may benefit women even if they do not improve production or incomes. The remainder of this section briefly

describes the indicators used for each of the domains and their grounding in the theoretical and empirical literature on gender and agriculture.

The 5DE are measured using ten indicators with their corresponding weights (Table 1). Full definitions of the indicators, based on the original survey questions, are provided in Annex 2.1. Each indicator is designed to measure whether each individual has an adequate achievement with respect to each indicator.

Table 1. The domains, indicators, and weights in the WEAI

Domain	Indicator	Weight
Production	Input in productive decisions	1/10
	Autonomy in production	1/10
Resources	Ownership of assets	1/15
	Purchase, sale or transfer of assets	1/15
	Access to and decisions on credit	1/15
Income	Control over use of income	1/5
Leadership	Group member	1/10
	Speaking in public	1/10
Time	Workload	1/10
	Leisure	1/10

Agricultural production.
Two indicators are used in this domain. The first, input in productive decisions, is constructed from answers regarding participation in decision making: (1) whether the individual had sole or joint input into making decisions about a) food crop farming, b) cash crop farming, c) livestock raising and d) fish culture; (2) the extent to which the individual feels he or she can make his/her own personal decisions regarding these aspects of household life if he/she wanted) to, including a) agricultural production, b) what inputs to buy, c) what types of crops to grow for agricultural production, d) when or who would take crops to market and e) whether to engage in livestock raising. An individual has adequacy in this indicator if he or she participates and has at least some input in decisions, or if someone else makes the decisions but the individual feels he or she could.

The second is a measure of autonomy that reflects a person's ability to act on what they themselves value. This indicator probes the person's own understanding of the situation and how they balance different motivations – to avoid punishment or social disapproval and to act on their own values (Alkire 2007). The indicator adapts the measure of autonomy developed by psychologists Richard Ryan, E. L. Deci, Valery Chirkov and others working in Self Determination Theory (SDT – see Chirkov et al. 2011). A sub-index is constructed from answers to the following: (1) My actions in [area of decision making] are partly because I will get in trouble with someone if I act differently; (2) Regarding [area of decision making] I do what I do so others don't think poorly of me; and (3) Regarding [area of decision making] I do what I do because I personally think it is the right thing to do. The areas of decision making refer to a) agricultural production, b) what inputs to buy, c) what types of crops to grow, d) when or who would take crops to market and e) livestock production. An individual is adequate with respect to autonomy if their actions are relatively more motivated by their own values than by coercion or fear of others' disapproval. Note that this indicator, unlike decision-making indicators, 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. It also reflects the situation in joint households, where a "joint" decision may be more or less autonomous, depending on circumstances.

"Both my husband and me take decisions collectively." ~Bangladeshi woman, aged 40

"She is powerless if she does not do work properly, does not follow the words of husband, does not follow the word of parent-in-law." ~ Bangladeshi man, aged 56

"I feel like things in the house you should sit down, discuss and agree so that there is no quarrel." ~Ugandan woman, aged 40

Access to and control of productive resources. Three indicators comprise this domain: 1) ownership of land and assets; 2) decisions regarding the purchase, sale or transfer of land and assets, and 3) access to and decisions on credit.

The first indicator examines whether an individual reports having sole or joint ownership of land and assets, including agricultural land, large and small livestock, fish ponds, farm equipment, house, household durables, cell phone, non-agricultural land and means of transportation. A person is considered to have adequate achievements if he or she reports having sole or joint ownership of at least one major asset (i.e., not including poultry, non-mechanized equipment or small consumer durables). While some might argue that sole ownership is more indicative of empowerment than joint ownership, recent qualitative work in Uganda (Bomuhangi, Doss, and Meinzen-Dick 2011) indicates that land is often held jointly; women can be more empowered if they have joint ownership of a valuable asset (such as land) as compared to having sole ownership of a minor asset.

The second indicator, defined over similar assets, asks who is the person who can make the decisions regarding the purchase, sale or transfer of land and assets. 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. As with the first indicator, a person has adequacy in this area if he or she participates in decisions to buy, sell or transfer the asset, conditional on the household owning it.

The third indicator examines decision making regarding whether to obtain credit and how to use the proceeds from credit from various sources (nongovernmental organizations, formal and informal lenders, friends or relatives, rotating savings and credit associations (ROSCAs)). To have adequacy in 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.

"Mostly single people are empowered, widows or widowers, since they have rights over their property." ~Ugandan woman, aged 30

"I am the one who makes the decision but I consult my wife." ~Guatemalan man, aged 40

"The agricultural land is most valuable among all assets to me because I get a whole year of food from it and I get money from selling crops." ~Bangladeshi woman, aged 35

Control over the use of income. This domain is commonly covered by such nationally representative household surveys as the DHS. The single indicator for this dimension measures the degree of input into decisions on the use of income generated from a) food crops, b) cash crops, c) livestock production, d) nonfarm activities, e) wage and salary work and f) fish culture, and the extent to which the individual feels he or she can make their own personal decisions regarding their wage or salary employment and major and minor household expenditures.[6] A person is considered adequate with respect to this indicator if he or she has input on decisions about income generated, conditional on participation in the activity.

"Some men use the money to drink – and the things you are supposed to do together are not possible because he has drunk the money. As women we suffer with the responsibilities." ~Ugandan woman, aged 30

"[Being] powerful or mighty means those who have much money and know people. But the most important is the money. Everything is possible if money is available." ~ Bangladeshi man, aged 68

Leadership in the community. The fourth domain comprises two indicators: 1) whether the person belongs to an economic or social group and 2) whether the person feels comfortable speaking out in public. Recognizing the value of social capital as a resource, the group member indicator shows whether the person is a member of at least one group, encompassing a wide range of social and economic groups. It is possible that a person may not want to join a group because of social and cultural norms that discourage participation in activities outside the household, as demonstrated by the quote from a 23-year old Bangladeshi woman in the box below, or because family members do not approve.

Whether the person is comfortable speaking up in public consists of responses to questions regarding 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 other similar programs, and to protest the misbehavior of authorities or elected officials. While not covering the entire range of possibilities for public engagement, this variable presents some indication of the respondent's empowerment with respect to exerting "voice" and engaging in collective action.

Those who are stronger are women, they are the ones who advise men and take care of their families. This role is now ours." ~ Ugandan woman, aged 40

"[A leader is] good mannered, able to work well with the community, not oppress the people, be a listener, give people good advice and speak openly on issues." ~Ugandan woman, aged 23

"I am not involved in any group. . . I am not interested in any group and do not want to engage. I am a woman, I only do the work of [the] household." ~ Bangladeshi woman, aged 23

Time allocation. The final domain consists of two indicators measuring the allocation of time to productive and domestic tasks and satisfaction with the available time for leisure activities. The first indicator, productive and domestic workload, is derived from a detailed 24-hour time allocation module

[6] The pilot only included minor household expenditures; however, we recommend including major household expenditures as well.

based on the Lesotho Time Budget Study (Government of Lesotho 2003).[7] Respondents are asked to recall the time spent on primary and secondary activities the previous 24 hours. The individual is considered to be inadequate (have an excessive workload) if he or she worked more than 10.5 hours in the previous 24 hours, with hours worked defined as the sum of the time reported in work-related tasks as the primary activity plus 50 percent of the time reported as spent in work-related tasks as the secondary activity.

The last indicator asks whether the individual is subjectively satisfied with his or her available time for leisure activities like visiting neighbors, watching TV, listening to radio, seeing movies or doing sports. A person is adequate with respect to this indicator if he or she is satisfied with the available time for leisure.

"Agricultural work is a heavy work [and] needs much hard labor. Mental pressure is high." ~ Bangladeshi woman, aged 35

"My leisure time makes me happy because am with friends and we make each other laugh." ~Ugandan woman, aged 40

"I just don't have the time to do all of them [household and garden responsibilities]." ~Ugandan woman, aged 30

All in all, a woman (man) is defined as empowered in 5DE if she (he) has adequate achievements in four of the five domains or is empowered in some combination of the weighted indicators that reflect 80 percent total adequacy or more. The rationale behind the choice of the 80 percent cutoff for determining total adequacy is discussed in Section 8.1.2.

Although the WEAI was originally intended to measure women's empowerment alone, it became clear that by focusing only on women in isolation from the men in their household, the index would be missing an important piece that contributes to disempowerment or, conversely, to empowerment: gender equality. The importance of gender equality is highlighted prominently in the United Nations' MDGs, commonly accepted as a framework for measuring development progress. Closing gender gaps specifically – which typically favor males – has also been seen to contribute to women's empowerment.

It has been well documented (e.g., Klasen and Lamanna 2008; World Bank 2011) that gender inequalities at the societal or aggregate level impose societal costs in terms of foregone growth in per capita incomes. A number of indices 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

[7] The Lesotho Time Budget Study is part of the Lesotho Household Budget Survey (HBS), which can be accessed at http://surveynetwork.org/home/index.php?q=activities/catalog/surveys/ihsn/426-2002-002. This was a nationally representative government survey which collected time use data for 8182 adults, in addition to information on socio-economic and living conditions. According to Lawson (2012), the Lesotho time use survey adopts one of the better methods of collecting time use data by asking people to complete a time diary during one day. The diary contains different pre-printed activities and pre-printed time intervals of 15 minutes for a 24 hour period. This diary is then completed by the respondent who draws a line, on the appropriate row in the diary, that reflects the specific activity undertaken, and during the hours when this was done. By adopting such an approach, recall problems are minimized and the use of time diaries simplified. In the WEAI pilot, respondents did not keep a diary, but survey interviewers used a similar grid of pre-printed activities and time intervals.

(GII) produced by United Nations Development Programme as part of the Human Development Report (hdr.undp.org/en/statistics/gii/) and the Social Institutions and Gender Index (SIGI) of the OECD (Branisa, Klasen and Ziegler 2009)). Why, then, do we need to look at intra-household gender inequality?

A large body of evidence now demonstrates that failing to pay attention to intra-household gender inequality has costs in terms of attaining development objectives (see Alderman et al. 1995; Haddad, Hoddinott, and Alderman 1997; Quisumbing 2003). Studies on such diverse outcomes as child nutritional status (Smith et al. 2003) and child schooling as well as other studies, e.g. Quisumbing and Hallman (2006), use indicators of differences in age, education and assets at marriage between 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 (e.g., Cain 1984; Miller 1981). Educational differences can be viewed as a proxy for differences in earning power, which influences bargaining power (e.g., 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 in terms of agricultural productivity; Udry (1996) has shown, for example, that yields on female-managed plots are less than those on male-managed plots within the same household, owing to lower input application on female-managed plots. Peterman et al. (2011) show that using headship as a proxy for gender differences within households may also lead to underestimation of gender differences in agricultural productivity. Efforts to increase women's assets may succeed, but without measuring changes in men's assets, we know nothing about gender asset inequality. Research evaluating the long-term impact of agricultural interventions in Bangladesh found that while 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 and Kumar 2011).

Thus, an important innovation of the WEAI is that it also contains a measure of gender parity, 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. 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 maker 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. The GPI shows the percentage of women who achieve parity with respect to their male counterpart. 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 men, by reducing the empowerment gap between the male and female of the same household.

"We are two people and differ in our opinions. When he tells me to, I keep silent." ~Bangladeshi woman, aged 60

"Yes, I think myself powerful. But I do what my husband tells me to do anytime. I do as he tells me. It is no rare incident in this case." ~Bangladeshi woman, aged 23

3. The concept of multidimensional indices

The motivation to empower women working in agriculture has been well established in previous sections as being of intrinsic value to the women's lives as well as instrumentally important to agricultural growth and related development objectives. But why is a multidimensional *index* required – and one using this methodology in particular? Is it not more accurate and precise to look at each of the indicators separately, within each place and context, and try to understand the barriers to women's empowerment and the progress? The current section addresses this question as well as related questions, like why the WEAI has been designed to be "comparable" across countries and why the particular methodology (Alkire-Foster) was chosen. Section 8 describes *how* the WEAI is constructed; this section focuses on *why*.

The first reason the WEAI was constructed is to create a simple, intuitive and visible headline figure which can be compared across places and across time. While detailed analyses are necessary, possible and inevitable, a well-designed index can answer questions like, "Did women's empowerment in agriculture increase in relevant zones since 2012?" and, "In which zones are women most empowered in agriculture; in which least?" Empowerment has often been overlooked or not taken as a policy goal in part because it has been difficult to quantify and to compare across contexts. The WEAI seeks to be accurate enough for use at this level (Szekely 2005).

Further, the headline figure can be understood. The 5DE conveys the percentage of women who are empowered and the "intensity" of disempowerment. The GPI shows the percentage of women who enjoy gender parity and the "gap" between women and men. These numbers are easy to understand and operationalize. They can also be compared by groups. They will show changes over time and provide incentives to reduce both the incidence and intensity of disempowerment. Similarly, the GPI creates an incentive to reduce both the incidence of disparity between women and men and the gap. Empowerment is a complex and dynamic concept, and one indicator alone does not suffice. Rather, empowerment in agriculture occurs when a woman has adequate achievements across a set of different conditions. More precisely, she needs the joint distribution of advantages to exceed some threshold. The WEAI has a multidimensional internal structure, but communicates it simply.

The Alkire-Foster (AF) methodology was used because it not only creates that headline figure and intuitive partial indices, it also enables readers to pull the headline figure apart into its ten indicators. Simply put, the index immediately enables readers understand *how* women are empowered and disempowered. This is because the index can be broken down to show women's achievements in each indicator and domain in order to see at a glance the areas requiring improvement.

A further motivation for a multidimensional index of empowerment is to monitor advancements across all key components of empowerment using a coherent framework. Empowerment entails adequate levels of productive resources, credit, decision-making authority, control over income, voice, time and intra-household parity. Because of the AF methodology properties, the headline 5DE index can be broken down to show how achievements in each indicator changed over time. Both the 5DE and the GPI can be further broken down by regions, ethnic affiliations, household types and other variables to compare empowerment and gender equity across population groups.

A vital and unprecedented contribution of the WEAI is the GPI, which reflects gender parity between the primary male and primary female living in the same household. This index provides a fine-grained

understanding of gender differentials in empowerment. From the same micro data, it is also possible to compare the gap by other variables such as age differences, marital status, household types, main modes of production, household income, educational status of male or female and so on. It is also possible to study the gap between average achievements among disempowered women and men rather than looking at the household level. Thus the GPI presents an innovative index, and the data from which it is constructed allow detailed analyses of gender differentials in empowerment in agriculture.

In the WEAI and sub-indices, an individual is empowered if he or she enjoys adequate achievements in 80% of the weighted indicators or more. But we can also explore the range of achievements among empowered and disempowered women more closely. Each woman has an "empowerment score" which is the percentage of domains in which she has achieved adequacy. It is then easy to identify who has achieved adequacy in less than 40% of the domains, for example. If we consider this group to be the "most disempowered," then it becomes possible to target them, for example, for special services. The situation of the most disempowered can be further analyzed to facilitate targeting: Where do these women live? What are their educational and wealth levels and their social group? What kind of production are they primarily engaged in? What is their age and educational differential from their spouse? Etc.

As the WEAI indicators are each direct measures of a particular kind of empowerment, the WEAI does not itself include variables such as education and wealth, which are often thought to proxy empowerment. This adds tremendous value because it is possible to see very starkly how empowerment in agriculture relates to achievements in these other variables and to ascertain any regular relationships across contexts.

Finally, the WEAI is a first rather than a final attempt. In terms of academic work and also the ongoing improvement of the index, it is necessary to ascertain more precisely its comparability across contexts, its accuracy in reflecting local conceptions of empowerment, its strengths and oversights in different contexts and its policy relevance. Such analyses will spark further constructive engagement as to how to improve the WEAI to better shape policy and reflect improvements in women's empowerment in agriculture.

4. Questionnaire development and case studies

4.1 Structure and design

As previously mentioned, the concept and choice of domains for the WEAI were broadly established by USAID based on their priorities for Feed the Future programming in 19 focus countries. Questionnaire design for the pilot instruments was an iterative process led by IFPRI with input from USAID, OPHI, the field survey teams and other experts on gender research methods. In the design phase, a review of survey instruments containing potential indicators for the 5DE, as well as supporting household modules, was undertaken to assess the range of tools with proven success in different cultural settings. These included both publicly available standard questionnaires such as the DHS and World Bank's Living Standards Measurement Surveys (LSMS), as well as studies on measures of empowerment (Narayan 2005, Alsop et al. 2006, Ibrahim and Alkire 2007), but also numerous surveys implemented by IFPRI and other research organizations focusing on gender indicators in certain domains (e.g., time use or autonomy measures). This review was presented to a group of gender and agriculture experts in July 2011 at IFPRI, in order to solicit feedback on the feasibility, specificity and generalizability of different combinations of indicators. Following this process, general instruments at the household level and individual level were drafted by IFPRI to include variations of promising modules identified at the expert workshop.

The individual-level questionnaire is the primary instrument for measuring empowerment and contains modules designed to elicit responses on the 5DE. The pilot version included experiments using

alternative phrasings of questions to allow validation and comparison of responses across different modes of question formation in order to better guide the choice of questions to be included in the final index questionnaire. The main objective of this exercise was to arrive at the most consistent and robust indicators possible, while at the same time seeking to streamline the length and complexity of survey administration. Another consideration was the ability or the feasibility of the indicators to show change over time and the potential for Feed the Future interventions to have a measurable impact on the indicators. Therefore, the pilot instrument contained seven modules: one for the identification of the respondent, followed by one focused on each domain, and an additional module around decision making. The decision was made early on that the individual questionnaire (and thus empowerment in agriculture) would be administered to women and men in the same households, so that a true comparative gender indicator could be developed.

The focus of the household-level questionnaire is to solicit background information on household demographics and related outcomes in order to allow analysis of the correlates of and conditioning factors that affect individual empowerment. The household questionnaire also contains alternative measures of individual-level outcomes, so that men's and women's responses could be validated at the household level. The final questionnaire included informed consent and eight modules on the following topics: a) household identification, b) household demographics, c) dwelling characteristics, d) employment and labor force activities, e) land and agriculture, f) livestock, g) business and entrepreneurship, and h) consumption and consumption habits.

The questionnaire modules drew on past IFPRI surveys on household information and individual-level survey modules on agricultural decision making, assets, credit and income, as well as OPHI questions related to relative autonomy that drew from the Ryan and Deci (2000) and Chirkov et al. (2011) for cross-country work. The time use module drew upon the Lesotho Time Use Survey (2003) specifically allowing for both primary and secondary activities in any 15-minute period.[8]

The pilot survey instruments were subsequently adapted for country-specific piloting and later revised to include only the indicators used to construct the WEAI. The survey instruments are available along with other documentation at http://www.ifpri.org/publication/womens-empowerment-agriculture-index.

Following preliminary results from the pilot surveys, a second round of quantitative and qualitative data collection was undertaken to validate, contextualize and explore concepts of empowerment, particularly around the 5DE. The narrative guides for this exercise were developed by the IFPRI and OPHI teams and included the application of the individual pilot questionnaire, followed by and interspersed with semi-structured narratives. One objective was to explore respondent understanding of certain aspects of empowerment, for example by asking: "What does it mean to be empowered? For example, if there was someone in your community who you think is empowered, how would you describe them? Can you think of a time when you felt empowered?" or "What qualities do you think makes a 'leader'? Do you feel like you are a leader? Why and Why not?" Respondents were also asked to show how they understood the ways questions were phrased or to give views surrounding assumptions made in coding the quantitative results, for example: "Sometimes assets are owned by one person in the household, other times they are owned by the whole household. Ideally, how would assets be owned in your household?" or "Which activities that we asked about do you most enjoy and which do you most dislike? Which would you consider 'work' and which would you consider 'leisure'?" The qualitative interview guides developed were meant to be a framework from which to explore women and men's stories rather than a strict set of questions to be administered with set answers. Further information on the sampling and fieldwork aspects of the case studies is included below.

[8] See http://surveynetwork.org/home/index.php?q=activities/catalog/surveys/ihsn/426-2002-002

4.2 Choice of pilot countries and local adaptations

As the WEAI was meant to be a tool applicable in many different cultural settings, it was important that the choice of pilot country reflect some of the main regional differences among the Feed the Future focus countries. Based on the scope and timeline envisaged for the index development, and the experience of IFPRI in field research within the focus countries, a joint decision was taken by USAID and IFPRI to select Bangladesh to represent South Asia, Guatemala to represent Latin America and Uganda to represent sub-Saharan Africa.[9] Consideration was given to the stage of Feed the Future programming and monitoring in each country as well as the research environment in terms of ethical reviews, acceptability of field research and established relationships with survey teams in each of the three countries. Following this selection, modifications were made to the pilot questionnaires to reflect local conditions. These modifications were generally of two types. First, and most commonly, response codes were changed to reflect local conditions (for example, including polygamous marriage structures in Uganda, changing assets lists to reflect commonly held durables and production assets of countries, or changing recall periods to reflect crop cycles in a region or country). Second, in some cases, additional modules were included to capture country-specific productive activities which were deemed to be important to gender and agriculture (for example, in Bangladesh, a module was added to specifically measure men's and women's participation in and decision making on aquaculture). These local adaptions are an essential part of questionnaire design and should be done in consultation with local partners, using previously implemented household surveys in the country and regions if possible.

4.3 Training and field partners

For the pilot fieldwork, IFPRI built on existing relationships, partnering with local firms who had extensive experience working on household surveys: Data Analysis and Technical Assistance, Ltd. (Bangladesh), Vox Latina (Guatemala) and Associates Research Uganda Limited (Uganda). A week-long training of enumerators, including field pretests, was conducted in each country with support from IFPRI staff. During this process, questionnaires were further revised and additions were made to an Enumerator Manual which served as a guide and a reference to enumerators. An example copy of the Enumeration Manual for Uganda is included in the documents found on the IFPRI website. The case study training consisted of a two-day training using a selection of the same enumerators who completed the pilot surveys, including a pilot test on the second day. Emphasis in training was placed on translations and particularly on how to interpret questions in the local language to convey complex concepts like "empowerment" across different dialects. Photographers accompanying survey teams sat in on the case study training so they would better understand the objectives and process of the study and fieldwork.

5. Field implementation considerations

5.1 Ethics review and informed consent

Research plans and instruments were submitted for ethics review and approved at IFPRI in Washington, D.C., as well as in Uganda at the Ugandan National Council of Science and Technology (UNCST) and in

[9] Other Feed the Future focus countries in Latin American are Nicaragua, Honduras and Haiti. Other focus countries in South Asian are Nepal, Cambodia and Tajikistan. Other focus countries in Sub-Saharan African are Ethiopia, Ghana, Kenya, Liberia, Mali, Malawi, Mozambique, Rwanda, Senegal, Tanzania and Zambia. For more information on Feed the Future focus countries see http://www.feedthefuture.gov/countries .

Guatemala at Zugueme. No further review was required in Bangladesh, because biological specimens were not collected. As part of the ethics review, guidelines around informed consent of interview subjects were reviewed. In all pilot surveys and case studies, informed consent pages were translated into local languages and one copy was left with respondents so that they retained a copy of contact information for the study. Examples of this informed consent are found in the questionnaires available on the IFPRI webpage. Particular care was taken in modifying informed consent for the case study narrative, as the case studies included photographs and in some cases video footage. To protect the identity of the case study respondents, pseudonyms are used in the presentation of results.

5.2 Sampling

The budget allowed a pilot of 350 households (625 individuals) in Guatemala and Uganda and 450 households (800 individuals) in Bangladesh. Because the objective of the survey was to produce empowerment measures for women, and for women in relation to men in their households, the pilot sampled only single female and dual adult households (i.e., those with male and female adults). The sampling strategy oversampled single female households (approximately 20 percent of total samples) in order to obtain sufficient sample sizes for analysis. The pilots focused on rural areas in Feed the Future "zones of influence," or priority areas where Feed the Future programming is running and will take place in the future. The Bangladesh pilot was conducted in the districts of Khulna, Madaripur, Barguna, Patuakhali and Jessore, in the south/southwestern part of Bangladesh close to the Indian border. The Guatemala pilot was conducted in the Western Highlands, in the *departamentos* (departments) of Quetzaltengo, San Marcos, Huehuetenango, El Quiché and Totonicapán, areas with a high concentration of indigenous populations. The Uganda pilot covered five spatially dispersed rural districts in the North (Kole and Amuru), Central (Masaka and Luwero) and Eastern regions (Iganga) of the country. The results are therefore not representative of the countries as a whole; rather they reflect regional implementation of Feed the Future programs and should be interpreted accordingly. Figure 1 depicts the sample areas in each country.

Within each pre-selected administrative area mentioned above, which correspond to the Feed the Future zones of influence, sampling was based on probability proportional to population size (PPS) methodology. In Bangladesh, five villages were selected from each of the preselected rural districts using PPS, and 18 households were randomly selected from each village (14 dual adult and four female adult only) for a total of 450 households (800 individuals). Household selection was based on a two-page village census conducted prior to fieldwork. In Guatemala, 25 villages were selected using PPS from the five preselected *departamentos* and 14 households were randomly selected from each village (11 dual adult and three female adult only) for a total sample size of 350 households (625 individuals). Household selection was based on village listings by household type conducted in advance of the pilot survey. In Uganda, five parishes and 25 local council areas were selected from five preselected districts in two stages using PPS sampling, and 14 households were randomly selected from each local council (11 dual adult and three female adult only) for a total of 350 households (625 individuals). Similar to Guatemala, household selection in Uganda was based on village listings conducted in advance of the pilot survey. Further details and instructions on how enumerators completed the sampling based on listings are included in the Enumerator Manual.

Sampling for the case study narratives was done with the objective of selecting men and women with variation in household type (single female or dual adult) as well as by WEAI scores. In each country enumerators worked with local leaders in two villages to purposefully select a total of 14 women and six men (20 per country) to be case study subjects. Selection was split between women and men who were perceived to have high, medium and low empowerment levels with respect to agriculture. In total, 60 case study narratives were collected and transcribed into English with accompanying photographs and in some cases video footage. The pilot (or quantitative) portions of their data were entered and scored in the

same way as the pilot data. These individuals' scores were checked to see whether they agreed with the general narrative and local perceptions (self-perception and by local leaders) of a person's empowerment. However these data were not used in the computation of the WEAI results for each country.

5.3 Household structure and choice of primary and secondary respondents

A very important issue in measurement and monitoring of the WEAI is *who* is being measured or tracked. Feed the Future monitoring aims to move away from characterizing households based on "headship," based on the literature on the diverse nature of family and household structure in many regions of the world. Therefore, for the pilot, a number of important distinctions were made. The first is the identification of who qualifies as a "household" and the second is who qualifies as an interview subject, or a "primary" and "secondary" respondent. As noted above, rural households residing in the Feed the Future zones of influence, regardless of the scope of their productive activities, were included in the sample.

For this survey, a *household* is a group of people who live together and take food from the "same pot." The important part of this definition is that the group of individuals shares at least some common resources and makes some common budget and expenditure decisions. A household member is someone who has lived in the household at least six months and at least three days in each week in those months. Even those persons who are not blood relations (such as servants, lodgers or agricultural laborers) are members of the household if they meet these qualifications, and alternatively, individuals who sleep in the household, but do not bear any costs for food or do not take food from the same pot, are not considered household members. This definition, including more specific examples and guidelines, is found in the survey Enumeration Manual and embedded in questionnaires. In some cases, it may make sense to add or subtract from the definition used in the pilot or to substitute an alternative definition for a certain context; however, the most important part is that enumerators have the same understanding of definitions so that implementation is consistent across households. Research from IFPRI and others have found that household definition can have significant impacts on variation of outcome indicators particularly surrounding labor and consumption (Beaman and Dillon 2012).

The *primary and secondary respondents* are those who are *self-identified* as the primary members responsible for the decision making, both social and economic, within the household. They are usually husband and wife; however, they can also be other members as long as there is one male and one female aged 18 or over. For example, one might find a widowed mother and her adult son as the primary female and male respondents. It may also be the case that there is only one primary respondent if that person is a female and there is no adult male present in the household. If the WEAI is used to track empowerment over time, it will be important to pre-fill this same member for follow up surveys. As noted above, male-only households are possible but very rarely found. Because of our focus on women's empowerment, they were excluded from the pilot.

5.4 Field implementation of pilot surveys and case studies

The pilot surveys were all fielded from September to November 2011. Bangladesh and Uganda fieldwork took place over four weeks in September 2011 while fieldwork in Guatemala took place over four weeks from October to November. Teams in Uganda and Guatemala were language-group specific to account for local indigenous and ethnic-group dialects, and enumerators in all pilot countries traveled in male and female pairs. Questionnaires were checked for accuracy by field supervisors and subsequently entered using Microsoft Access or Statistical Package for the Social Sciences (SPSS) and checked for accuracy using Stata programs. The case studies were all fielded in January 2012 over a one week period and audio recordings were transcribed into Microsoft Word and reviewed by IFPRI staff. Both survey efforts

included proper mobilization and sensitization of local leaders to convey the intent of the research and gain appropriate local approval for data collection.

6. Statistical analysis of the raw data

As previously mentioned, the individual-level questionnaire is the primary instrument for measuring empowerment in the 5DE. In order to select indicators for each domain and streamline the construction of the WEAI, as well as address concerns over the length and complexity of survey administration, many questions were eliminated. The following sections describe the statistical analyses that informed these decisions.

6.1 Sample sizes: Non-response and non-participation considerations

In order to maintain the decomposability properties of the WEAI, responses are necessary for every indicator of the WEAI for each individual.

Our analysis separately considered non-response and non-participation with respect to two types of questions. The first type applies to all arenas of a respondent's life (e.g., How would you rate your available time for leisure activities like visiting neighbors, watching TV, listening to radio, seeing movies or doing sports?). The second poses a question in reference to only certain arenas of the respondent's life (e.g., How much input did you have in making decisions about food crop farming?). In the case of the former, a non-response leads to the respondent being dropped from the sample, and for the latter, non-response or non-participation in every relevant arena leads to the same outcome. In order to maintain sufficiently large samples sizes for robust analysis, individual questions or arenas with high non-response or non-participation rates were excluded from consideration in the WEAI.

In general, non-response rates for modules B (decision making), C (productive capital), E (leadership) and G (autonomy in decision making) are extremely low. Non-participation rates in these modules vary considerably across arenas. This implies that respondents typically participate in only a subset of the listed activities, for example, types of decisions for modules B and G, assets for module C (productive capital), lending sources for module C (productive capital) or groups for module E.

These results speak to the necessity of aggregating responses across arenas when constructing indicators for the WEAI. Indeed, shifting the focus of our analysis to aggregate participation rates (i.e., the percentage of respondents that participate in at least one arena relative to the total number of male or female respondents) significantly increases participation rates in all modules – rates are generally above 75 percent. In modules C (productive capital) and E (leadership), aggregate participation rates generally remain below 50 percent.

With respect to the time allocation module (F), complete time use data (i.e., summing to 24 hours) was collected for all respondents, except for one male who refused the module.

6.2 Data quality and measurement error

An initial examination of the pilot survey data, upon receipt of the data from the survey firms, revealed a multitude of data entry and field errors. After careful cleaning of the data by IFPRI personnel with the help of technicians from the survey firms, three issues remained. First, the enumerators did not receive

adequate support for the novel questions module G (autonomy in decision making) in all three countries, thus many enumerators reported difficulty understanding the survey instructions regarding when and to whom certain questions in module G should be posed. In Bangladesh, a second round of phone interviews was conducted to collect accurate responses. In the case of Uganda and Guatemala, this was not possible, and thus, the pilot data for these questions should be used cautiously. The survey instructions were revised and enumerator training materials were prepared for subsequent Feed the Future applications of the index.[10]

The other two questionnaire issues remain in the final survey. The extensive time use module identifies adequacy if the respondent has worked less than 10.5 hours in the past 24 hours. That is, it takes the past 24 hours as representative of the person's average workload across the past year and scores them as adequate or inadequate based upon this particular day. The past 24 hours may not actually have been representative – if it was a weekend, during the slack season or a household emergency, then work levels may be outliers from the average. Thus in many cases women's adequacy or inadequacy score in time poverty may be misidentified. This could be problematic for monitoring in general, particularly if the survey is taken at different seasons of the year (once in harvest, once during the slack season). Ideally a short time use module would be implemented that reflects average workload across a longer period than 24 hours; at a minimum it would be useful to add a question about whether the day was part of a peak agricultural season, regular agricultural season, or fallow or slack season when there is little cultivation.

The other question in the time use domain asks about subjective satisfaction with leisure; however, in the pilot studies in Bangladesh and Guatemala, male subjective satisfaction with leisure was *lower* than women's, perhaps because of different frames of references between men and women. That is, it is possible that some women had adapted their preferences for leisure to what seemed possible within their circumstances and so reported higher satisfaction rates whereas their actually hours of leisure per day might be lower. This may pose challenges in using the question for monitoring purposes, because if a woman's frame of reference changes, her reported satisfaction might go *down*, but that may not reflect a decrease in leisure time itself. Ideally, a more objective question might be used.

Many of the individual-level questionnaire modules contain questions focused on similar aspects of decision making in similar, "overlapping" arenas. By comparing individual responses to such questions, we can judge the consistency of responses. Such comparisons are possible between modules B (decision making), C (resources) and G (autonomy in decision making) in certain overlapping arenas having to do with agricultural production. Specifically, for each overlapping arena we can compare whether an individual reported at least input into very few decisions in module B, making a decision in at least one of the module C decisions (i.e., use, sale, purchase, etc.), and at least joint decision making in module G. The results of these comparisons are generally positive. Across all comparisons, the majority of responses are consistent, and for most questions, the percentage of consistent responses is much higher.

Another metric of consistency is obtained by comparing the responses of men and women from the same household. These sorts of comparisons are possible for certain questions in modules C (decision making) and G (autonomy in decision making). Two types of criteria are used. First, we consider instances of identically corresponding responses. For example, if the husband indicates he solely made the decision and the wife indicates that her spouse made the decision. Second, we look at cases with unambiguously

[10] As indicated in Section 2.3, the wording of the relative autonomy questions adopted in the Feed the Future monitoring protocols are (1) My actions in [area of decision making] are partly because I will get in trouble with someone if I act differently; (2) Regarding [area of decision making] I do what I do so others don't think poorly of me; and (3) Regarding [area of decision making] I do what I do because I personally think it is the right thing to do. The areas of decision making refer to a) agricultural production, b) what inputs to buy, c) what types of crops to grow, d) when or who would take crops to market, and e) livestock production.

contradicting responses. For example, if the husband and wife each indicate that they solely made the same decision.

Across all possible comparisons in modules C and G, male and female responses identically correspond in 43 percent of cases; responses to the same questions unambiguously contradict each other in only 28 percent of cases. Together these results imply that although males and females in the same household may not exactly agree on how decisions are made, their perspectives are more likely to agree than to be at complete odds with each other.

A further metric of reliability, designed to measure the internal consistency of questions such as some of those in modules B and G, is Cronbach's alpha (Cronbach 1951). In nearly all of the cases, the value of Cronbach's alpha for these questions is greater than 0.85; although for certain questions in module B in Bangladesh, the value of Cronbach's alpha is approximately 0.71 and 0.79, respectively. Generally speaking, these values imply internal consistency.

6.3 Association analysis

It is essential to understand the associations among WEAI indicators. Very high correlation could result in an implicitly greater than intended weight being assigned to an indicator pair. This would need to be considered and justified explicitly.[11]

Given the high rates of non-response and non-participation across arenas for the questions used to construct the WEAI, analysis of the association between individual arena-specific questions can only be partial. The following analysis makes use of the aggregate indicators used to construct the WEAI.

As all of the aggregate indicators are dichotomous variables, tetrachoric correlation analysis would be appropriate if the assumption can be made that the distribution is bivariate normal.[12] In nearly all cases, tetrachoric correlation coefficients are less than 0.44. Even in the two extreme cases (input into productive decisions-control over use of income; and ownership, purchase, sale, or transfer of assets), the tetrachoric correlation coefficients remain less than 0.67. Thus, the indicators used to construct the WEAI are not highly correlated based on tetrachoric correlation analysis.

7. Index options: Indicators and cutoffs

This section describes the indicators used for the five Domains of WEAI and how they are constructed, as well as the cutoffs that are set.

[11] This issue deserves further thought. Most composite indices aim to have high correlations. Multidimensional Alkire-Foster-style measures have no fixed rule regarding high or low correlations, but study the associations in order to ascertain that the weights are appropriate. In the case of WEAI, because the weights were fixed a priori by USAID, we had to manage the sub-index construction and indicator cutoffs such that these weights made sense. However, it would be inaccurate to say that we are looking for low correlations across the board. Lastly, we call these "associations" and not correlations because not all measures are cardinal.

[12] The assumption that the distribution is bivariate normal cannot always be justified. Analyses across a variety of measures (the odds ratio, Cramers' v for 2x2, and chi-squared) yields the same overall conclusions, although each measure does not give exactly the same type of information. For example, the chi-squared gives no information on the strength or direction of association, just whether it is significant. Patterns from the cross-tabulations are clear, but do take a lot of space to present, while the tetrachoric correlation coefficients are compact to present but rely on the assumption of bivariate normality.

7.1 Agricultural production

In the arena of agricultural production we use two indicators: input in productive decisions and relative autonomy in making productive decisions.

1. Input in productive decisions

Input in productive decisions is constructed from answers to these questions regarding participation in decision making: 1) if the 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; 2) the extent to which the individual feels he or she can make his/her own personal decisions regarding these aspects of household life if he/she want(ed) to: a) agricultural production, b) what inputs to buy, c) what types of crops to grow for agricultural production, d) when to or who would take crops to market, and e) whether to engage in livestock raising? Although these categories have subsequently been modified by Feed the Future, the same analytical procedure will apply, albeit with relevant modification.

We initially considered using two different indicators, one for having input on decisions and another for whether one *could* make personal decisions if one wanted to. However, that could lead to double counting, because all those who report that they do make decisions would also say that they could do so. But the fact that someone does not make decisions in an arena does not necessarily mean they are disempowered, if they have no interest in participating in decisions. To consider only one of those questions would be to neglect relevant information;[13] therefore, the two questions are aggregated into one indicator.[14] For example, if a wife takes care of finances because her husband has no interest in finances, but the husband feels that he could have input if he wanted to, then both would be empowered in that indicator.

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, a sub-indicator was 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.

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 was created that considers the respondent adequate if he or she makes the decisions himself/herself or if he or she feels that he or she could participate in the decision making to least at a medium extent.

For both questions, we opted for thresholds at the middle of the answer scale. Setting higher thresholds would be perhaps too strict since most agricultural production tends to be a group activity, while lower thresholds would be too flexible and consider as adequate people with almost no participation in decisions.[15]

[13] Although the first question might be seen as measuring objective input while the second measures perceptions, limiting the score to only the first question is not a viable option in practice, because of missing observations for the first question. In two of our three pilot areas a significant part of the sample did not participate in any agricultural activity (27 percent of women in Bangladesh and 45 percent in Guatemala).

[14] Because most individuals do not participate in all activities of question regarding input in decisions, there are a high number of missing observations in these questions. Therefore it is not possible to use an exploratory factor analysis to test the validity of aggregating these two sets of questions, because there are not enough observations to produce reliable results.

[15] Undertaking agricultural production solely (by oneself) would not have been a realistic definition of autonomy because most agricultural production involves labor or other inputs from other family members – perhaps not for the smallest plots but certainly for larger plots (or herds).

All these sub-indicators are then aggregated into the "input in productive decisions" indicator. The respondent is considered adequate in terms of input in productive decisions if he or she is considered adequate in at least two of the sub-indicators described above; in other words, the individual is considered adequate if there are at least two types of decisions in which he/she has some input in decisions or makes the decision or feels he/she could make the decision to a medium extent if he/she wanted to.[16] When the cutoff is set at a minimum of two types of decisions, the proportion of women with adequate input in productive decisions is 70.4 percent of total respondents in Bangladesh, 52.0 percent in Guatemala and 92.9 in Uganda.[17]

2. Relative autonomy in productive decisions

The Relative Autonomy Indicator (RAI) measures the ability of a person to act on what they themselves value, to have their own intrinsic motivations prevail over motivations to please others or avoid punishment, for example. This indicator probes the person's own understanding of the situation and enables respondents to easily explain the different motivations that influence activities (Alkire 2007). The RAI 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 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. The activity areas refer to a) agricultural production, b) what inputs to buy, c) what types of crops to grow, d) when to or who would 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 are aimed at capturing a different kind of motivation: external, introjected and identified, respectively.[18] 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 they personally value this particular course of action. Identified motivations, which are here associated with empowerment, occur when the person's actions are shaped based on their own values. Because motivations are often mixed in real life – we act in part to please others as well as based on our own personal convictions – the RAI enables respondents to articulate the extent to which their actions are shaped by all three motivations. If the "identified" motivation is relatively stronger than the others, then the person has adequacy in autonomy.

To check the validity of the responses, we assume that the extrinsic and introjected regulations are positively correlated with one another and both are negatively correlated with identified regulation. To test if our questions were good proxies for these theoretical constructs, we computed the polychoric correlations between the answers to these questions. In data from Bangladesh the three theoretical hypotheses (positive correlation between questions 1 and 2, negative correlation between questions 1 and

[16] Note that households or individuals who are not involved in agriculture, but are involved in other nonagricultural enterprises, might appear disempowered in this domain because the survey focuses on agriculture and does not capture all other economic activities.

[17] Proportions of pilot sample were computed considering three categories: adequate, inadequate and missing information. Therefore, the percentages presented throughout this section refer to the full sample and not only to the sample of individuals for whom we have information regarding each indicator.

[18] According to Deci and Ryan (2000, pp. 235–236), "external regulation "is the classic case of extrinsic motivation in which people's behavior is controlled by specific external contingencies. People behave to attain a desired consequence such as tangible rewards or to avoid a threatened punishment…. Whereas with external regulation the control of behavior comes from contingent consequences that are administered by others, with introjected regulation the contingent consequences are administered by the individuals to themselves. The prototypic examples are contingent self-worth (pride) or threats of guilt and shame." Identification "is the process through which people recognize and accept the underlying value of a behavior. By identifying with a behavior's value, people have more fully internalized its regulation; they have more fully accepted it as their own."

3, and negative correlation between questions 2 and 3) are verified. In data from Guatemala the three questions are positively correlated, which means that only one of the hypotheses is verified. In Uganda only one of the hypotheses is not verified, namely the negative correlation between external and identified regulation. However recall that the pilot data on this question collected in Guatemala and Uganda are to be used with caution.

An exploratory factor analysis (EFA) was performed to test whether answers to each of the three questions (1– 3 listed above) regarding different areas of decision making converged in the same factor and whether factors discriminate well so answers to different types of questions refer to different motivations (external, introjected and "identified"). When all the data from the three pilot surveys was considered jointly, the EFA showed a good convergence and discrimination amongst the three types of questions. When the EFA was performed for each country separately the results were ambiguous. This is probably due to the fact that the ratio of observations to items (questions) in these samples is very low: 3.8 for Bangladesh, 3.4 for Guatemala and 1.2 for Uganda.

For each area of decision making, Ryan and Deci's Relative Autonomy Index is computed. This index corresponds to the weighted sum of the different types of regulations' subscales. The conventional weights are (-2) for external regulation, (-1) for introjected regulation and in this case (3) for identified regulation.[19] The index varies between (-9) and (9). A RAI value that is greater than zero means that the individual acts moved more by identified regulation than by external and introjected regulation.

All these area-specific relative autonomy indices are then aggregated into the indicator "autonomy in production." The respondent is considered as having adequate autonomy in production if his/her RAI is above one in at least one of the five areas of decision making.

This indicator had high missing values for Bangladesh (17 percent) and Guatemala (24 percent) where a significant proportion of the sample had reported to not be involved in any agricultural activity, namely 23 percent in Bangladesh and 35 percent in Guatemala. In line with treatment in other indicators, those respondents for whom the indicator autonomy in production was missing and who had reported not participating in any agricultural activity (food crop farming, cash crop farming, livestock raising and fishing or fish culture) were considered as adequate.[20]

Under this definition of autonomy in production, 89.8 percent of women in Bangladesh are adequate, 66.3 percent in Guatemala and 82.3 percent in Uganda.

7.2 Resources

To capture the individual's control over productive resources, three indicators are used: ownership of assets, decision making over productive resources and access and decision making over credit.

3. Ownership of land and 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,

[19] As the cross-cultural applicability of the RAI has already been explored extensively, we used the conventional weights.

[20] We considered other alternative criteria to identify the part of the sample that was not eligible for assessment of the RAI in agricultural productive decisions and, hence, reduce the number of missing values. One of these criteria was to consider as adequate those individuals who lived in households where none of the respondents reported having spent any time in agricultural activities (farming and fishing) in the day before the interview. However, probably due to seasonality, that was the case of majority of the respondents in Bangladesh and Guatemala.

farm equipment, house, large and small household durables, cell phone, non-agricultural land and means of transportation). A person is considered adequate in this area if he/she reports having sole or joint ownership, conditional on the household owning those assets.[21] Furthermore, for the individual to be considered adequate in this domain, ownership cannot be limited to minor assets only (poultry, non-mechanized equipment or small consumer durables).

First, for each type of major asset we created an indicator 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 we created an indicator of individual's ownership, which equals one if the individual, alone or jointly, owns the majority of that type of asset.

The asset-specific indicators are aggregated into the indicator of the respondent's ownership of assets. According to this indicator, an individual is adequate in terms of ownership if he or she owns at least one asset, as long it is not only chickens, ducks, turkeys, pigeons, non-mechanized farm equipment or small consumer durables. There was some discussion of whether cell phones should also be classified as minor assets, but they were finally included among the major assets that would count for empowerment because of the important spillover effects associated with the ownership of a cell phone. There are only 19 individuals who have no other major assets besides cell phones, eight in Bangladesh, two in Uganda and nine in Guatemala.

The individuals who live in households that do not own any type of asset are considered inadequate in terms of ownership.

Using this definition of ownership of assets, the proportion of women with adequate ownership is 90.7 percent in Bangladesh, 84.6 percent in Guatemala and 88.0 percent in Uganda.

4. Decisions regarding the purchase, sale, or transfer of land and assets

In many societies, full "ownership" of assets may not apply but holding other bundles of rights – especially control rights over purchase and disposal of assets – can also be empowering. We therefore 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/she participates in decisions to buy, sell, or transfer the asset, conditional on the household owning it. The pilot questionnaire included questions on rights to bequeath the asset, as well as rights over the asset in case of marital dissolution, but these were excluded from the WEAI owing to the high degree of nonresponse. Possibly these are future events for which an individual may not have knowledge of those rights except as determined by local norms, which may not be likely to vary significantly across households in a given locality (e.g., Fafchamps and Quisumbing 2002 for Ethiopia).

Based on the results of exploratory factor analysis performed by asset, there is strong empirical evidence to support the clustering of the exchange rights (to sell, to give and to rent); and there is some empirical evidence to support the clustering of those exchange rights and the right to buy.

While 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 pond or fishing equipment, non-mechanized farm equipment and mechanized farm equipment.

[21] Self-reported ownership is used, rather than any externally imposed definitions of "ownership" or reference to titles and other documentation (see Doss et al. 2011).

First, for each type of right (sell, give, rent and buy) and asset, an indicator is created that equals one if the respondent has, alone or jointly, that right over that type of asset; otherwise the indicator is zero. Second, for each type of agricultural asset the types of rights are aggregated into an indicator of whether the individual has those rights over that asset. This indicator assumes the value one 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/she has at least one type of right over at least one type of agricultural asset. The individuals who live in households that do not own any type of agricultural asset are considered inadequate, hence, are assigned the value zero for this indicator. In Uganda 84.0 percent of the women are adequate, this percentage is of 68.4 in Bangladesh and 60.6 in Guatemala.[22]

5. Access to and decisions on credit
This indicator examines decision making on credit: whether to obtain credit and how to use the credit obtained from various sources (nongovernmental organizations, formal and informal lenders, friends or relatives, rotating savings and credit associations (ROSCAs)). To have adequacy on this indicator, a person must belong to a household that has access to credit and, if the household used a source of credit, the person participated in at least one decision about it.

First, the indicator of access to credit is created, which assumes the value of one 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. A very large proportion of the women in the sample live in households that did not use any source of credit: 50.0 percent in Bangladesh, 70.3 percent in Uganda and 74.0 percent in Guatemala. Unfortunately, the pilot survey did not collect information regarding the reasons why the household did not use any type of credit. The new version of the questionnaire will include questions to assess whether the household is credit constrained or not.

Second, for each potential source of credit, types of decisions are aggregated into an indicator that assumes the value one 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 of access to and decisions on credit. The respondent is classified as adequate in terms of credit if he or she makes at least one decision relative to credit from at least one source of credit. The individuals who live in households that do not use any source of credit are considered inadequate in terms of access to credit and, hence, are assigned the value zero for this indicator.

Using this definition of access to and decisions on credit, the proportion of adequate women is 39.6 percent in Bangladesh, 20.3 percent in Guatemala and 24.3 percent in Uganda.

7.3 Income

To capture the individual's control over income and expenditures only one indicator is used that reflects the individual's role in decision making regarding the use of income.

6. Control over use of income
Control over use of income is constructed from answers to questions regarding input into decisions on the use of income. Question 1asked if the individual participated in the activity, how much input did he/she

[22] Note that ownership covers all assets and the indicator for decision-making rights covers only agricultural assets. Therefore, some people who own non-agricultural assets do not report having decision-making rights over agricultural assets.

have in decisions on the use of income generated from a) food crop farming, b) cash crop farming, c) livestock raising and d) fish culture? Question 2 asked about the extent to which the individual feels he or she can make his/her own personal decisions regarding these aspects of household life if he/she want(ed) to: a) his/her wage or salary employment and b) major and minor household expenditures.[23]

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 in terms of input in decisions on the use of income if he/she participates in that activity and has at least input into some decisions related with that activity.

The answer scale for the question regarding the extent to which the individual feels he/she can participate in the 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/she makes the decisions himself/herself or if he/she feels that could participate in the decision making at least at a medium extent.

Then, all these sub-indicators are aggregated into the indicator for control over income. The respondent is considered adequate in terms of 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 making decisions regarding household minor expenditures. The proportion of women with adequate control over use of income is 75.6 percent in Bangladesh, 52.3 percent in Guatemala and 79.1 percent in Uganda. The percentage of women who feel that they can make decisions only regarding household expenditures is 12.4 percent in Bangladesh, 32.0 in Guatemala and 15.1 in Uganda.

Initially, we considered including in this domain an indicator of whether the individual had some extra money that he or she alone decides how to use. However, a comparison across countries gave unexpected results: Guatemala had the worst headcounts although it is the least poor while Bangladesh performs best although has the highest level of poverty. Therefore, it was decided against the use of the indicator because it did not seem to accurately capture income control.

7.4 Leadership

This domain aims to capture the individual's potential for leadership and influence in his/her community. Two indicators are used as proxies for that potential: active membership in community groups and comfort in speaking in public.

7. 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 a) agriculture producers or marketing groups, b) water users' groups, c) forest users groups, d) credit or microfinance groups, e) mutual help or insurance groups (including burial societies), f) trade and business associations, g) civic or charitable groups, h) local government groups, i) religious groups, and j) other women's groups. 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 et al. forthcoming).

The percentage of women with adequate group membership is 34.7 in Bangladesh, 47.7 in Guatemala and 62.9 in Uganda. Because nominal membership does not necessarily translate into effective participation

[23] The pilot only included minor household expenditures; however, we recommend including major household expenditures as well.

(Agarwal 2001), additional questions were included in the pilot about whether the respondent had ever been in a leadership position in each group, how much input the respondent had in making decisions in this group and how many of the last five meetings the respondent had attended. However, including these as indicators resulted in too high a threshold; very few men or women were empowered in this domain, according to that indicator. Less than 30 percent of women reported having ever been in a leadership position in any group.

8. Speaking in public

The indicator of whether the person is comfortable speaking up in public is constructed based on the responses to questions regarding the person's ease in speaking up in public for three different reasons: 1) to help decide on infrastructure (like 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. A question on speaking up to intervene in a family dispute was also considered; however, it eventually was not included because this may be considered part of the private rather than public domain. 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 cutoff. So, the respondent is comfortable speaking in public if he/she does not answer "no, not at all comfortable". The three reason-specific indicators are aggregated into the speaking in public indicator. The respondent is considered adequate in terms of speaking in public if he or she is comfortable speaking in public for at least one of the first three reasons listed above. The percentage of women adequate in the speaking in public indicator is 67.3 in Bangladesh, 64.3 in Guatemala and 83.7 in Uganda.

We considered the inclusion of other indicators in the leadership domain, namely voting decision, direct questions soliciting opinions of whether or not the respondent thought they could change things and investing in their community.

An individual would be considered adequate in terms of voting decision if he or she made the decision about whom to vote for, conditional on having voted in the past elections. According to this indicator, 95.4 percent of women in Guatemala and 98.3 percent of women in Uganda have adequacy. We also observed that in Bangladesh, 23.0 percent of women who voted in the last elections would have been inadequate because they did not decide who to vote for, compared to 33.9 percent of men. Having quite a volatile indicator with very high rates of adequacy with little variation on the one hand and very low rates in Bangladesh is sensible if we were extremely confident that they were reflecting an underlying condition of political empowerment, but as we were not confident of this, we did not include it. Furthermore, voting behavior is only tangentially linked to agriculture.

The indicator that reflects the feeling that one can change things would consider the respondent adequate if he or she feels that an individual like themselves can generally change things in the community where he or she lives if he or she wants to, even if with difficulty. Again, we dropped this indicator because the answers did not seem consistent. In Guatemala and Uganda the percentage of adequate men is much higher than the percentage of adequate women (differences of 21.5 percentage points in Guatemala and 5.4 percentage points in Uganda), in Bangladesh the percentage of adequate women is 62.7 percent compared with 19.7 percent of men.

An individual would be classified as adequate in terms of investing in the community if in the last 12 months he or she 1) contributed money or time to building small wells or maintenance of irrigation facilities in their community; and/or 2) contributed money or time to building or maintaining roads in their community; and/or 3) contributed money or time to town development projects or public works

projects in their community; and/or 4) contributed money or time to building or maintaining their local mosque/church/temple; and/or 5) gave money to any other family because someone in their family was sick; and/or 6) helped another family out with agricultural labor; and/or 7) helped another family out when they needed help with child care. This indicator was dropped because the focus of WEAI is on leadership in groups and activities that are more directly related to agriculture, not the maintenance of public infrastructure.

7.5 Time

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 available time for leisure activities.

9. Workload

The productive and domestic workload is derived from a detailed 24-hour time allocation module in which respondents are asked to recall the time spent on primary and secondary activities in the 24 hours prior to the interview, starting at 4:00 am on the day before the interview. The amount of hours worked is defined as the sum of the time the individual reported spending in work-related tasks as the primary activity, plus 50 percent of the time she/he reported spending in 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, care for children/adults/elderly, commuting and travelling. The individual is defined as adequate in terms of workload if his/her number of hours worked per day was below the time poverty line of 10.5 hours in the previous 24 hours. This cutoff was derived based on a similar methodology to Bardasi and Wodon (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, using data from Guinea.[24]

Under these conditions, the percentage of women with a manageable workload is 81.1 in Bangladesh, 62.0 in Guatemala and 55.7 in Uganda. We recognize that a 24-hour recall does not adequately represent time allocation, especially in an agricultural society. If the previous day was a holiday, the workload might have been less (or even greater, if there was extra food preparation or other domestic work). The observations for which the reference day for the time use module was a holiday or a non-working day are not dropped because that would imply a sample reduction of approximately 25 percent. More problematic from the standpoint of an agricultural index is the issue of seasonality of labor, which cannot be captured in 24-hour recall. However, recall of time allocation longer than 24 hours generally has higher recall error, and the recommended re-visiting of households on multiple days was not possible, so we have used this approach (Harvey and Taylor 2000).[25]

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[24] In the Bardasi and Wodon (2006) study, the upper and lower thresholds for adults for adults were expressed in hours per week (70.5 hours per week and 94 hours for the lower and higher threshold, respectively); the above paragraph expressed the thresholds in hours per day for comparability with the thresholds used in this study.

[25] There are different guidelines for collecting time use data in studies that focus on time allocation and those that collect time allocation data in the context of a multi-topic household survey. The former focuses on obtaining information on time use over a period of time, typically requiring multiple visits. For example Eurostat's official time use guideline (http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-RA-08-014/EN/KS-RA-08-014-EN.PDF) states: "It is recommended that the survey days/dates be representative of, and cover a full 12-month period, i.e. 365 consecutive days, preferably including potentially problematic days and periods like Christmas and New Year." A similar point is made for developing countries in the UN's *Guide to Producing Statistics on Time Use* (http://unstats.un.org/unsd/publication/SeriesF/SeriesF_93E.pdf): "Given the likely cyclical pattern of activities over a year, the time period for a time-use survey is ideally taken to be 12 months. The 12-month period may be a

10. Leisure time
The respondents were asked to rank their level of satisfaction with their time available for leisure activities like visiting neighbors, watching TV, listening to radio, seeing movies or doing sports from one (not satisfied) to ten (very satisfied). The leisure time indicator considers the respondent adequate if he/she ranks his/her level of satisfaction equal or higher to five, which means, if she is indifferent or satisfied with her 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. As this is a subjective question, it reflects the respondents' frame of reference as well as their actual achievements. Male and female reference standards may differ, making gendered comparisons problematic. For example in Bangladesh men's dissatisfaction with their leisure was higher than women's. Ideally, a more accurate short time use module would be used for both time use questions.

Satisfaction with the distribution of work duties within your household was also considered, but in the end it was decided that the workload indicator was a more precise measure of time poverty.

8. Computing the Women's Empowerment in Agriculture Index (WEAI)

The WEAI is composed of two sub-indexes: one measures the five domains of empowerment for women (5DE), and the other measures gender parity in empowerment within the household (GPI). The weights of the sub-indexes 5DE and GPI are 90 percent and 10 percent, respectively. The choice of weights for the two sub-indices is somewhat arbitrary but reflects the emphasis on 5DE, while still recognizing the importance of gender equality as an aspect of empowerment. The total WEAI score is the weighted sum of the country – or regional – level 5DE and the GPI. Improvements in either the 5DE or GPI will increase the WEAI.

8.1 Five Domains of Empowerment Index (5DE)

This sub-index assesses whether women are empowered across the five domains examined in the WEAI. For the women who are disempowered, it also shows the percentage of domains in which they meet the required threshold and thus experience "sufficiency" or "adequacy." The 5DE sub-index captures women's empowerment within their households and communities.

Although our final goal is a measure of empowerment, we construct the 5DE in such a way that disempowerment can be analyzed. The advantage of this construction is that it allows us to identify the critical indicators which must be addressed to increase empowerment. This enables decision makers to

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calendar year, or it may be any other 12-month period (for example, from June 1 of one year to May 31 of the following year)" (p. 48). The need for the time use data to reflect the woman's achievements across seasons is, of course, of paramount importance when the time use data are interpreted as accurate at the *individual* level as in the case of WEAI. In almost all time use studies, data are taken as accurate at the group level (women), not at the individual level as required by the WEAI. A study of time use surveys in Mexico, India and Benin found that the modules required specially trained enumerators. In India they visited four times to capture seasonality; there were also guidelines (if yesterday was a funeral / holiday) about which day to pick, which was not done in the pilot but should be included in future time use surveys. http://www.levyinstitute.org/undp-levy-conference/papers/paper_Vacarr.pdf

focus on the situation of the most disempowered. We begin by computing a disempowerment index across the five domains (M_0) and then the 5DE is computed as (1- M_0).[26]

8.1 1 Identification of the disempowered

There are two equivalent notations that can be used to describe the construction of the 5DE. One focuses on the percentage of empowered women and the adequacies among the disempowered. The other notation focuses on the percentage of disempowered women and the percentage of domains in which they lack adequate achievements. In this section, we use the second notation, as it is consistent with the M_0 measurement (Alkire and Foster 2011a).

The first step is to code all adequacy indicators, described in the previous section such that they assume the value one if the individual is inadequate in terms of that indicator.

Each person is assigned an inadequacy score according to his/her inadequacies across all indicators. The inadequacy score of each person is calculated by taking a weighted sum of the inadequacies experienced, so that the inadequacy score for each person lies between zero and one. The score increases as the number of inadequacies of the person increases and reaches its maximum of one when the person experiences inadequacy in all ten indicators. A person who has no inadequacy in any indicator receives a c_i score equal to zero. Formally:

$$c_i = w_1 I_1 + w_2 I_2 + \cdots + w_d I_d$$

where $I_i = 1$ if the person has an inadequate achievement in indicator *i* and $I_i = 0$ otherwise, and w_i is the weight attached to indicator *i* with $\sum_{i=1}^{d} w_i = 1$.

A second cutoff or threshold is used to identify the disempowered. The disempowerment cutoff is the share of (weighted) inadequacies a woman must have in order to be considered disempowered, and we will denote it by *k*. For those whose inadequacy score is equal to or below the disempowerment cutoff, even if it is non-zero, their score is replaced by a zero and any existing inadequacies are not considered in the "censored headcounts." We refer to this important step as censoring the inadequacies of the empowered (see Alkire and Foster 2011b; Alkire Foster and Santos 2011). To differentiate the original inadequacy score from the censored one, we use the notation $c_i(k)$ for the censored inadequacy score. Note that when $c_i > k$, then $c_i(k) = c_i$, but if $c_i \leq k$, then $c_i(k) = 0$. $c_i(k)$ is the inadequacy score of the disempowered.

8.1.2 Computing the 5DE

As mentioned above, we start by computing the five domains of disempowerment index (M_0). Following the structure of the Adjusted Headcount measure of Alkire and Foster (2011a), the 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.

[26] For more detail on the "positive" construction of (1-M_0) – in this case with respect to Bhutan's Gross National Happiness Index – see Alkire et al. 2012.

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:

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

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, the 5DE is easily obtained:

$$5DE = 1 - M_0.$$

Although we built the 5DE based on M_0, it can also be expressed as:

$$5DE = H_e + H_p \times A_e$$

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 score.

A higher disempowerment cutoff implies a lower number of disempowered individuals and, hence, a higher empowered headcount ratio and a higher 5DE. Given the main purpose of the WEAI, tracking change in women's empowerment triggered by Feed the Future programs, it was important to establish a cutoff that would result in baseline indices that would allow a reasonable scope for improvement. Too high a cutoff could result in many individuals being classified as disempowered (and potentially with very little room for improvement); too low a cutoff 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 with respect to different cutoffs, we selected the disempowerment cutoff of 20 percent. An individual is disempowered if her inadequacy score is above 20 percent. This is the same as saying that an individual is identified as empowered in 5DE if she has adequate achievements in four of the five domains or enjoys adequacy in some combination of the weighted indicators that sum to 80 percent or more, or has an adequacy score of 80 or above.

8.1.3 Breaking down M_0 by domains and indicators

Having measured empowerment, we now need to increase it. To do so it is useful to understand how women are disempowered in different contexts. A key feature of the M_0 is that, once the disempowered have been identified (in other words, once the M_0 has been computed), one can decompose the M_0 into its component-censored indicators to reveal how people are disempowered – the composition of inadequacies they experience.

To decompose by indicators, compute the censored headcount ratio in each indicator. The censored headcount ratio for a particular indicator is obtained adding up the number of disempowered people who are deprived in that indicator and dividing by the total population. Once all the censored headcount ratios have been computed, it can be verified that the weighted sum of the censored headcount ratios also generates the country's M_0. That is, if the M_0 is constructed from all ten indicators:

$$M_{0_{country}} = w_1 CH_1 + w_2 CH_2 + \cdots + w_{10} CH_{10}$$

Here w_1 is the weight of indicator 1 and CH_1 is the censored headcount ratio of indicator 1, and so on for the other nine indicators, with $\sum_{i=1}^{d} w_i = 1$. It is called "censored" because the inadequacies of women who are not identified as disempowered are not included, in order to focus attention on disempowered women.

The percentage contribution of each indicator to overall disempowerment is computed as follows:

Contribution of indicator i to $M_0 = \frac{w_i CH_i}{M_{0_{country}}} \times 100$

The contributions of all indicators will sum to 100 percent. Whenever the contribution to disempowerment of a certain indicator greatly exceeds its weight, this suggests that there is a relatively high inadequacy in this indicator in the sample under analysis. The disempowered are more inadequate in this indicator than in others. Such indicators with high inadequacy point to areas for intervention to increase empowerment.

8.1.4 Decomposing by population sub-groups

Another key feature of the M_0 (and of the 5DE) is that it can be decomposed by population sub-groups such as regions or ethnic groups, depending upon the sample design. For example, if there are two sub-groups, eastern and western, for which the survey is representative, the formula for their decomposition is:

$$M_{0_{country}} = \frac{n_E}{n} \times M_{0_E} + \frac{n_W}{n} \times M_{0_W}$$

where E denotes 'eastern' and W denotes 'western', and n_E/n is the population of eastern areas divided by the total population, and similarly for n_W/n (and $n_E + n_W = n$). This relationship can be extended for any number of groups, as long as their respective populations add up to the total population.

The contribution of each group to overall disempowerment can be computed using the following formula:

Contribution of eastern areas to $M_{0_{country}} = \frac{\frac{n_U}{n} \times M_{0_E}}{M_{0_{country}}} \times 100$

Whenever the contribution to disempowerment of a region or some other group widely exceeds its population share, this suggests that some regions or groups may bear a disproportionate share of poverty.

8.2 Gender Parity Index (GPI)

The GPI is a relative inequality measure that reflects the inequality in 5DE profiles between the primary adult male and female in each household. By definition, households without a primary adult male are excluded from this measure, and thus the aggregate WEAI uses the mean GPI value of dual-adult households.

Similar to the case of the 5DE, we compute the GPI to celebrate gender parity in a positive sense; however, its construction immediately facilitates analysis of the households that lack gender parity.

For the purpose of constructing the GPI, those whose inadequacy score is equal or below the disempowerment cutoff of *k*, their score is replaced by the value of *k*, which is 20 percent. To differentiate this censored inadequacy score from the censored score used to compute the 5DE, we use the notation $c'_i(k)$ for the "new" censored inadequacy score. Note that when $c_i > k$, then $c'_i(k) = c_i$, but if $c_i \leq k$, then $c'_i(k) = k$.

Each dual-adult household is classified in terms of gender parity. They 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. Put differently, a household enjoys parity if the woman is empowered or, if she is not empowered, her adequacy score is equal to or above 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 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}) is:

$$H_{GPI} = \frac{h}{m}$$

Where *h* is the number of households classified as inadequate in terms of 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 headcount of the women and men living in households with no 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 $c'_j(k)^W$ and $c'_j(k)^M$ 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. [27]

The GPI is computed as follows:

$$GPI = 1 - (H_{GPI} \times I_{GPI})$$

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}).

[27] Note that by definition, a woman's censored inadequacy score is the same as her uncensored score, because if she is empowered, she does not lack gender parity so the gap is not computed. However, the primary male may or may not be empowered. If he is empowered, there is a question of whether to use his actual inadequacy score or whether to use his censored inadequacy score. The GPI uses his censored score. This enables it to avoid sensitivity to increments and decrements among empowered men. However, using the censored inadequacy score will give, on average, a larger empowerment gap and will overemphasize inequalities between disempowered women and empowered men, as against inequalities when both are disempowered. The empirical importance of these two considerations is an appropriate question for further research as more data become available.

9. Pilot findings

In this section, we present the WEAI and its sub-indexes, 5DE and GPI, for each country pilot.

In order to identify the areas that contribute most to women's disempowerment, we decompose women's disempowerment index (M_0) by domain and indicator. For comparison purposes, we present the M_0 and its decomposition also for the sample of men.

9.1 Southwestern Bangladesh Pilot

The WEAI for the sample areas in southwestern Bangladesh is 0.762. It is a weighted average of the 5DE sub-index value of 0.746 and the GPI sub-index value of 0.899. The results are presented in Table 9.1.

The 5DE for Bangladesh shows that 39.0 percent of women are empowered. In the pilot areas, the 61.0 percent of women who are not yet empowered have, on average, inadequate achievements in 41.6 percent of domains. Thus, women's M_0 is 61.0% x 41.6% = 0.254 and 5DE is 1 – 0.254 = 39.0% + (61.0% x (1 - 41.6%)) = 0.746. In these pilot areas, 59.8 percent of men are not yet empowered. The average inadequacy score among these men is 33.7. So, men's M_0 is 59.8% x 33.7% = 0.201 and men's 5DE is 1-0.201 = 0.799.

Based on the decomposition of the disempowerment measure (Table 9.4), the domains in the Bangladesh sample areas that contribute most to women's disempowerment are weak leadership (30.6 percent) and lack of control over resources (21.6 percent). Approximately half of the women in the survey are not yet empowered and do not belong to any group. Forty-five percent of women are not yet empowered and lack access to credit and the ability to make decisions about it, and 28 percent have little decision-making power over the purchase, sale or transfer of assets.

The configuration of men's deprivations in empowerment is strikingly different from women's in the pilot regions of Bangladesh (see Figure 9.1). The lack of leadership and influence in the community contribute much more to men's disempowerment than to women's, as does time poverty. On the other hand, men report very little disempowerment in control over income and in decision making around agricultural production compared to women.

The GPI, meanwhile, shows that 59.8 percent of women have gender parity with the primary male in their household. Of the 40.2 percent of women who are less empowered, the empowerment gap between them and the male in their household is quite large at 25.2 percent. Thus the overall GPI in the pilot area is {1 − (40.2% x 25.2%)} or 0.899.

9.2 Western Highlands of Guatemala Pilot

The WEAI for the sample areas in the Western Highlands of Guatemala is 0.702. It is a weighted average of the 5DE sub-index value of 0.690 and the GPI sub-index value of 0.813 (see Table 9.2).

The 5DE for Guatemala shows that the empowered headcount ratio is 28.7 percent among women and 60.9 percent among men. The disempowered women have, on average, inadequate achievements in 43.5 percent of dimensions. Thus the women's M_0 is (1-28.7%) x 43.5% = 0.310 and 5DE is 1 – 0.310 = 28.7% + ((1-28.7%) x (1-43.5%)} = 0.690. The 39.1 percent of men who are not yet empowered have an average inadequacy score of 32.9 percent. So, men's M_0 is 39.1% x 32.9% = 0.129 and 5DE is 1 – 0.129 = 0.871.

The decomposition of Guatemala's 5DE (see Table 9.5) shows that the domains that contribute most to Guatemalan women's disempowerment are lack of leadership in the community (23.7 percent) and control over use of income (23.7 percent). More than 60 percent of women are not yet empowered and lack access to credit and the ability to make decisions about it, 45.1 percent are not group members, and 36.7 percent lack sole or joint decision-making power over income.

The configuration of men's deprivations in empowerment is similar to that of women's in the pilot regions of Guatemala, but men have uniformly more empowerment than women in all of the indicators (see Figure 9.2). The main difference is that lack of control over income contributes less to men's disempowerment than to women's, while the lack of control over resources contributes relatively more.

The GPI for the Western Highlands of Guatemala shows that 35.8 percent of women have gender parity with the primary male in their household. The 64.2 percent of women who are less empowered have an empowerment gap between them and the male in their household that is quite large – 29.1 percent. Thus the overall GPI is (1-(64.2% x 29.1%)), or 0.813.

9.3 Uganda Pilot

The WEAI for the pilot districts in Uganda is 0.800. It is a weighted average of the 5DE sub-index value of 0.789 and the GPI sub-index value of 0.898 (see Table 9.3).

The 5DE for Uganda shows that 43.3 percent of women and 63.0 percent of men are empowered. The 56.7 percent of women who are not yet empowered have an average achieved empowerment in 62.8 percent of dimensions (1- 37.2%). Thus women's 5DE is 43.3% + (56.7% x 62.8%) = 0.789. The average inadequacy share among the 37.0 percent of men who are still disempowered is 32.8 percent. So, men's 5DE is 1 – (37.0% x 32.8%) = 0.878.

The domains that contribute most to women's disempowerment are time burden (26.3 percent) and lack control over resources (23.1 percent). According to these pilot results, 48.7 percent of women are not yet empowered and lack access to or decision-making ability over credit, 30.7 percent do not have a manageable workload and 31.9 percent are not members of any group (see Table 9.6 and Figure 9.3).

The configuration of men's deprivations in empowerment is somewhat different from women's in the pilot regions of Uganda. The lack of decision making about agricultural production contributes much more to men's disempowerment than to women's (22 percent vs. 9 percent).

The GPI for the selected districts of Uganda shows that 54.4 percent of women have gender parity with the primary male in their household. Of the 45.6 percent of women who are less empowered, the empowerment gap between them and the male in their household is 22.4 percent. Thus the overall GPI is (1-(45.6% x 22.4%)), or 0.898.

10. Correlation with other measures

The 5DE deliberately focused only on issues of empowerment in agriculture. The precision of the measure creates a strength for analysis: we can easily scrutinize how empowerment in women's specific agricultural roles relates to their wealth, their levels of education and their empowerment in other areas. The pilot survey also included questions related to these other household and individual characteristics. This section examines the relationship between empowerment and those characteristics. In particular, we analyze the cross tabulations between empowerment and the following characteristics:

- Individual age group;
- Individual education level, defined as the highest grade of education completed;
- Wealth quintile to which the household belongs;
- Household hunger score;
- Decision making and autonomy with respect to other domains such as serious health problems, protection from violence, expression of religious faith, definition of daily tasks and the use of family planning.

Two of these indicators require introduction. The wealth index divides the respondents of the survey into five quintiles according to their relative command over a range of household assets. As in the Demographic and Health Surveys, the wealth index was constructed using principal components analysis, taking into account assets, dwelling characteristics and other indicators.[28]

A household hunger score (HHS) was also computed following the methodology of the USAID FANTA-2 project.[29]

A first observation concerns the decision-making versus autonomy questions. The decision-making questions reflect whether the respondent makes the decision or feels like she could participate in making the decision if she wanted to. On the other hand, autonomy questions reflect the extent to which the respondent's motivation for decision making reflects her values rather than social pressure or direct coercion. Across the three pilots the autonomy questions distinguish more strongly between women who are "empowered" versus "non-empowered" in terms of the WEAI than do the decision-making questions. For example, in Uganda, the average percentage difference between decision-making scores for women who are not empowered according to the WEAI is 9.2 percent, whereas for autonomy it is 12.7 percent; in Guatemala the distinction is more marked, with a 6 percent difference for the decision-making questions and a 29.68 percent difference for autonomy questions. In Bangladesh the pattern is less marked and more varied across domains.

Whilst the strength of association varies, in all three pilots, across all six domains of decision making and autonomy, women who were empowered according to the WEAI had higher empowerment in the six domains in all but one instance (decision making regarding protection from violence in Bangladesh) – and in that instance it was only very slightly higher among disempowered women. As measures of association we present Cramer's V and Phi's coefficient.[30] To assess the statistical significance of the association between empowerment and these characteristics, we computed Pearson's chi-squared and Fisher's exact test for the hypothesis that the rows and columns in a two-way table are independent. The results of these tests should be interpreted carefully since in some cases, for instance in the Guatemala pilot, the number of missing observations is not unimportant.

[28] The full list of indicators used to calculate the wealth index includes the number of household members per sleeping room (or total room if the number of sleeping rooms is unavailable); roof top material of dwelling; floor material of dwelling; main source of drinking water for household; main type of toilet used by household; access to electricity; main source of cooking fuel for household; agricultural land (pieces or plots); large livestock; small livestock; fish pond or fishing equipment; mechanized farm equipment; non-farm business equipment; house (and other structures); large consumer durables; small consumer durables; cell phone; other land not used for agricultural purposes; means of transportation; and whether the household employs a household servant.

[29] See http://www.fantaproject.org/publications/tn12.shtml.

[30] We present Cramer's V for associations between empowerment and characteristics with more than two categories, namely age group, education level, health quintile and household hunger score. For associations between empowerment and decision making and autonomy, characteristics that were coded as dichotomous variables. We present the Phi-coefficient as measure of association.

10.1 Southwestern Bangladesh Pilot

The tabulations between the condition of empowerment and age, education level, wealth quintile to which the household belongs and household hunger score are displayed in Table 10.1.[31]

In Bangladesh, age was significantly associated with women's empowerment. Table 10.1 shows that more than 40 percent of women aged 26 to 55 were empowered, compared with less than 33 percent of those in younger or older age categories. This may reflect the relative lack of power of younger females, who are typically daughters-in-law, and much older women, who may now be dependent on sons for support. This relationship was not significant among men.

In education, most of the women in the sample had completed either a primary education or less: only six women had a secondary education, and one had tertiary. Interestingly, the relationship between education and empowerment in agriculture was insignificant for both men and women: 39 percent of women with less than a primary-school education were empowered, and the same percentage of women who had completed primary school was empowered. Among the seven women who had attained secondary school and higher, only two women were empowered. So, in this pilot area, women's empowerment in agriculture was not defined by whether or not they had completed primary school.

Wealth was significantly associated with empowerment, but it was not sufficient to ensure it: 21 percent of women in the poorest quintile were empowered, compared with 50 percent in the richest 20 percent of the population. The fact that 50 percent of women in the top wealth quintile were not yet empowered indicates that greater wealth increases empowerment but does not guarantee it.

In Bangladesh the relationship between empowerment in agriculture and living in a household reporting a higher hunger score was not statistically significant for women or men.

Results displayed in Table 10.2 show that women who were empowered by the 5DE reported slightly higher decision making and autonomy with regard to all areas of decision considered, with the exception of decision making regarding protection from violence. However, only a few of these relationships were statistically significant. So, we found evidence that women who were empowered in agriculture reported 1) greater decision making and autonomy with respect to religious faith; 2) higher decision making regarding family planning and 3) higher autonomy in protection from violence. In the case of decision making regarding family planning the association was statistically significant at a 1 percent level: 73 percent of women who were empowered in agriculture felt they could make family planning decisions, compared to 61 percent among women who were not empowered in agriculture.

Curiously, in Bangladesh men who were empowered in agriculture reported lower decision making with respect to minor household expenditures, health problems, protection from violence and expression of religious faith. However, none of these relationships was statistically significant. In fact, there was no statistical evidence of a relationship between men's empowerment in agriculture and decision making and autonomy in any of the areas considered.

10.2 Western Highlands of Guatemala Pilot

The tabulations between the condition of empowerment and age, education level, wealth quintile to which the household belongs to and household hunger score are displayed in Table 10.3.

[31] We also ran polychoric correlations, but do not present the results in Table 10.1 as they were rarely significant.

In Guatemala age was significantly associated with women's empowerment in agriculture. Only 9 percent of women aged under 26 and 14 percent of those aged between 56 and 65 were empowered, compared with more than 28 percent in other age cohorts. In contrast, among males the levels of empowerment were constant across age categories.

At standard levels of significance, there was no evidence of an association between education and empowerment in Guatemala. Most of the women in the sample had less than a primary education. Only 26 percent of women with less than a primary school education and 39 percent of women who had completed primary school were empowered in agriculture. Among men, these percentages were 59 and 65 percent, respectively.

Wealth was not strongly associated with empowerment in agriculture in the Guatemala pilot regions: 23 percent of women in the poorest quintile were empowered, compared with 33 percent in the richest 20 percent of the population. It is striking that on average, 69 percent of women in the top three wealth quintiles were not yet empowered (including 67 percent of the richest 20 percent), indicating that wealth is a very imperfect proxy for women's empowerment in agriculture. Indeed, the associations with wealth were not statistically significant.

The percentage of women not yet empowered in agriculture was higher in households reporting higher hunger scores, and this association was statistically significant. On the other hand, the percentage of men not yet empowered in agriculture was lower in households reporting higher hunger scores, but this association was not statistically significant.

Table 10.4 shows that in Guatemala, there was a clear association between women's empowerment in agriculture and empowerment in other domains: greater decision making and autonomy with respect to minor household expenditures, serious health problems, protection from violence, religious faith, their own daily tasks and use of family planning. The variable "autonomy" showed greater differences between those who were empowered in agriculture and those who were not than the variable "decision making". The differences in terms of decision making were not statistically significant, but the differences in terms of autonomy in all the areas of decision were significant at a 1 percent level. For example, 94 percent of women who were empowered in agriculture felt they could make decisions related to minor household expenditures, compared to 86 percent among women who were not empowered. Differences in terms of autonomy results were higher: 79 percent of women who were empowered reported autonomy with respect to minor household expenditures, but only 51 percent of disempowered women reported this type of autonomy.

In the Guatemala pilot, men who were empowered reported significantly higher autonomy in all decision-making areas considered. On the other hand, there was statistical evidence that men who were empowered in agriculture reported significantly lower decision making with respect to family planning.

10.3 Uganda Pilot

The tabulations between the condition of empowerment and age, education level, wealth quintile to which the household belongs and household hunger score are displayed in Table 10.5.

In Uganda, there was no evidence of an association between age and women's empowerment in agriculture. In contrast, the association between age and the rates of empowerment among males was significant at a 10 percent level. Forty-one percent of men aged below 26 were empowered, compared with 71 percent of those aged between 46 and 65 and 67 percent of those aged between 56 and 65.

There was a positive and significant association between education level and women's and men's empowerment. Forty percent of women with less than a primary school education were empowered; this percentage increased to 52 among those who had completed primary school. Fifty-five percent of men with less than a primary school education were empowered, compared with 69 percent of those who completed primary school.

In Uganda's pilot regions wealth was clearly associated with women's empowerment in agriculture: 31 percent of women in the poorest quintile were empowered, compared with 68 percent in the richest 20 percent of the population. In the second and third quintiles, around 35 percent of women were empowered in agriculture, rising to 45 percent in the fourth quintile and 68 percent in the fifth. In contrast, among males the levels of empowerment were constant across wealth quintiles. The percentage of men empowered in agriculture was 65 among those living in households in the poorest quintile and 71 among those living in households in the richest quintile.

The percentage of disempowered women and men was significantly higher in households reporting higher hunger scores.

Table 10.6 shows that in Uganda's pilot districts, women who were empowered in agriculture reported significantly greater decision making and autonomy with respect to almost all domains. Similar to the data from Guatemala, the variable "autonomy" tended to show even greater differences between those who were empowered in agriculture and those who were not than the variable "decision making". For example, 87 percent of women who were empowered in agriculture felt they could make decisions related to serious health problems, compared to 75 percent among women who were not empowered in agriculture. The difference in terms of autonomy results was wider: 80 percent of women who were empowered in agriculture reported autonomy with respect to serious health problems, but only 63 percent of disempowered women reported this type of autonomy. Men who were empowered also reported significantly greater decision making and autonomy with respect to most of the areas considered.

So in summary, there is no individual or household characteristic that is strongly associated (Cramer's V or Phi coefficient above 0.15) with empowerment in the pilot areas of all three countries simultaneously. This exposes the weakness of some traditional proxies for women's empowerment including educational achievements and wealth in reflecting women's empowerment in agriculture. This lack of strong correlation across all three countries may arise because gender and empowerment are both culture and context specific. For example, the low correlation between education and women's empowerment in Bangladesh may arise because agriculture is conceived of as a man's domain, and a woman, even if highly educated, may not participate much in agricultural decisions. In other cultures, she may have more scope for using her human capital to participate in agricultural decisions. These findings, of course, are based on only the three pilot countries and further work needs to be undertaken in other countries to see whether these results can be generalized.

11. Intra-household Patterns of Empowerment[32]

The richness of the intra-household data enables many further comparisons of women and men that have not been possible previously. Recall that the 5DE values for Bangladesh, Uganda and Guatemala pilots regions differ. In Uganda women have the highest 5DE score whilst in Guatemala it is men; among women the 5DE is lowest in Guatemala whereas for men it is lowest in Bangladesh. In absolute terms, the lowest male 5DE of 0.77 (Bangladesh) is only marginally lower than the highest 5DE for women (0.78, Uganda).

[32]. We are grateful to Prabhu Pingali for the suggestion to consider empowerment by household.

Across the pilot regions (which, recall, are not representative of the countries), the gender parity is highest in the Bangladesh pilot and lowest in Guatemala. In Bangladesh, though, while the share of women enjoying parity with the primary male in their household is highest (at 59.8 percent), in the households that lack parity, the gap is 25.2 percent. In contrast, in Uganda a lower percentage of women enjoy parity (54.4 percent), but in the households lacking parity, the gap is lower (22.4 percent). In Guatemala both indicators are worse, with only 35.8 percent of women enjoying parity and the remaining having the highest gap of 29.1 percent.

Table 11.1 below shows the intra-household patterns with respect to the 5DE. We see that the two extreme experiences are in Bangladesh and Guatemala. In Guatemala's pilot region, nearly 37 percent of households have a disempowered woman and an empowered man, and only 7 percent have the reverse. In contrast, in Bangladesh 17 percent of households have a woman who is disempowered and a man who is empowered, whereas 20.8 percent have it the other way around, with a situation more favourable to the woman than to the man. Thus it is very useful to consider the intra-household patterns by gender as these evolve over time.

Table 11.1 Empowerment patterns by household

Number of households with:	**Bangladesh Pilot**	**Uganda Pilot**	**Guatemala Pilot**
Households containing a woman and a man	331	250	187
Both woman and man are **empowered**	74	69	38
	22.4%	27.6%	20.3%
Both woman and man are **disempowered**	131	57	67
	39.6%	22.8%	35.8%
The **woman is disempowered;** the man is empowered	57	90	69
	17.2%	36%	36.9%
The **man is disempowered**; the woman is empowered	69	34	13
	20.8%	13.6%	7%

12. Next steps

Women's empowerment is a complex and multidimensional concept. That complexity has limited efforts to measure empowerment and incorporate it into program evaluation in a systematic manner, despite growing evidence of the important role that women's empowerment plays in poverty reduction. The few gender equity or women's empowerment measures that do exist do not address the issues most relevant for women in agriculture.

The WEAI offers a means to measure women's empowerment in a manner that is comparable across sites and relevant to agriculture. Based on intra-household surveys, it represents a compromise between the level of detail that might be desirable and the information that can be collected in a relatively succinct and replicable manner (i.e., not based on detailed ethnographic methods or very long surveys, and avoiding questions that yield too many missing values). It is not a perfect measure. As discussed above, there are limitations in many of the indicators used in the pilot survey, notably:

- Women who are engaged in decision making on nonagricultural activities may appear disempowered if they are not involved in agricultural decisions;
- Questions on control over resources and income do not capture many of the nuances behind these domains;
- The prevalence of decision-making questions means that female-only households are likely to be empowered;
- Group membership alone is an inadequate indicator of active participation (but more detailed indicators left too many missing values);
- The relative autonomy questions in the pilot were problematic in two pilots so training materials have been provided and an alternative form of the questions been provided;
- 24-hour recall of time use does not capture the seasonality of agriculture, unless it is administered in repeated surveys over an agricultural year;
- The "satisfaction with leisure" question is subjective and may reflect adaptive preferences. That is, women may be more satisfied with their leisure than men, because their expectations have adapted to what is possible in their circumstances

Despite these limitations, the pilot studies in Bangladesh, Guatemala and Uganda indicate that the WEAI indicators are relatively robust. The next step of testing their applicability has already begun as part of monitoring and evaluation in the Feed the Future zones of influence in 19 countries. Although the WEAI is designed to be comparable across countries, caution is in order regarding comparisons that might be made across these countries. The zones of influence are not nationally representative areas, and hence women's status in those zones may differ from the nation as a whole. Tracking changes over time, particularly for the same individuals and households, to see whether there is an improvement or deterioration in women's status in agriculture is likely to be a more important use than cross-national comparison. However, it would be useful to find opportunities to build the WEAI into nationally representative data sets as well.

Other organizations, such as civil society organizations implementing interventions to empower women, as well as some multilateral organizations, have expressed interest in using the WEAI in their work, and this is welcome. A number have also asked whether the index could be modified in various ways. While some adaptation of the questionnaire may be needed to fit local conditions, the Women's Empowerment in Agriculture Index should be computed from the same set of indicators, based on an intra-household survey that asks questions separately of the principal female and principal male in the household (so that the Gender Parity Index can be computed). Adding additional questions related to other areas of empowerment (e.g. health care and other decisions) would be welcome, especially for those organizations that are dealing with broader aspects of women's empowerment besides agriculture. Initially, it would be preferable to compare results of these different types of empowerment or, if they are to be added with the WEAI, to indicate this with a new name. As with other indices, further refinement of the WEAI is possible as it is updated. Perhaps the greatest contribution of the WEAI may be to define and highlight the domains of empowerment, so that agricultural development programs can address each domain. Ex ante assessments of programs should, at a minimum, insure that interventions "do no harm," such as by increasing women's workloads or transferring decision making or control of income from women to men. Baseline WEAI estimates can further serve as a diagnostic tool to signal key areas for interventions to increase empowerment. As illustrated in the pilot study results, the areas of disempowerment of women (and men) differ from country to country; the WEAI measures can help to identify who are the key decision makers in different types of production and whether the greatest needs are for resources, credit, leadership or time.

13. Works cited

Agarwal, B. (2001) Participatory Exclusions, Community Forestry, and Gender: An Analysis for South Asia and a Conceptual Framework. *World Development 29* (10): 1623–1648.

Alderman, H., Chiappori, P.A., Haddad, L., Hoddinott, J. and Kanbur, R. (1995) Unitary versus Collective Models of the Household: Is It Time to Shift the Burden of Proof? *The World Bank Research Observer* 10 (1):1–19.

Alkire, S. (2005) Quantitative Studies of Human Agency. *Social Indicators Research*, 74(1): 217–260.

Alkire, S. (2007) Measuring Agency: Issues and Possibilities . *Indian Journal of Human Development.* 1(1).

Alkire, S. (2008) Concepts of Measures and Agency. In K. Basu and R. Kanbur (eds), *Arguments for a Better World: Essays in Honor of Amartya Sen. Volume I: Ethics, Welfare and Measurement*, pp. 455−474. Oxford: Oxford University Press.

Alkire, S. and Foster, J. (2011) Counting and Multidimensional Poverty Measurement. *Journal of Public Economics*, 95(7–8): 476–487.

Alkire, S. Foster, J and Santos, M.E. (2011) Where did Identification Go*? Journal of Economic Inequality* 9, 501–505.

Alkire, S. and Santos, M.E. (2010) Acute Multidimensional Poverty: A New Index for Developing Countries. Working Paper 38. Oxford: Oxford Poverty and Human Development Initiative (OPHI).

Alkire, S., Ura, K. Wangdi, K., and Zangmo, T. (2012) An Extensive Analysis for the Gross National Happiness Index. Thimpu, Bhutan: The Centre for Bhutan Studies. Available on http://www.grossnationalhappiness.com

Alsop, R., Bertelsen, M. and Holland, J., (2006) *Empowerment in Practice from Analysis to Implementation*. Washington, DC: World Bank.

Bardasi, E. and Wodon, Q. (2006) Measuring Time Poverty and Analyzing its Determinants: Concepts and Applications to Guinea. In M. Blackden and Q. Wodon (eds.), Gender, Time Use, and Poverty in Sub-Saharan Africa. World Bank Working Paper No. 73. Washington DC: The World Bank.

Beaman, L. and A. Dillon. (2012) Do Household Definitions Matter in Survey Design? Results from a Randomized Survey Experiment in Mali. *Journal of Development Economics*, forthcoming.

Becker, E. (2012) Themes from Feed the Future Women's Empowerment in Agriculture Index: Report from Qualitative Case Studies in Bangladesh, Guatemala and Uganda. Unpublished report submitted to the International Food Policy Research Institute.

Bomuhangi, A., Doss, C. and Meinzen-Dick, R. (2011) Who Owns the Land? Perspectives from Rural Ugandans and Implications for Land Acquisitions. IFPRI Discussion Paper 1136. Washington, DC:

International Food Policy Research Institute (IFPRI). http://www.ifpri.org/sites/default/files/publications/ifpridp01136.pdf

Branisa, B., Klasen, S. and Ziegler, M. (2009) Background Paper: The Construction of the Social Institutions and Gender Index (SIGI). University of Goettingen, Department of Economics. Working paper.

Buvinić, M., and Rao Gupta, G. (1997) Female-Headed Households and Female-Maintained Families: Are They Worth Targeting to Reduce Poverty in Developing Countries? *Economic Development and Cultural Change* 45(2): 259–280.

Cain, Mead T. (1984) Women's Status and Fertility in Developing Countries: Son Preference and Economic Security, World Bank Working Paper No. 682. Washington, DC: World Bank.

Chirkov, V. Ryan, R.M., and Deci, E.L. (2011) *Human Autonomy in Cross-Cultural Context: Perspectives on the Psychology of Agency, Freedom, and Well-Being*. New York: Springer.

Clinton, H. (2012) Remarks on Evidence and Impact: Closing the Gender Data Gap. Presentation at Gallup Organization, Washington, DC, July 19, 2012. http://www.state.gov/secretary/rm/2012/07/195244.htm

Cronbach, L. (1951) Coefficient Alpha and the Internal Structure of Tests. *Pyschometrika*. 16 (3): 297–334.

Doss, C. et al. (2011) *The Gender Asset and Wealth Gaps: Evidence from Ecuador, Ghana, and Karnataka, India.* Bangalore: Indian Institute of Management Bangalore.

Fafchamps, M. and Quisumbing, A.R. (2002) Control and Ownership of Assets Within Rural Ethiopian Households. *Journal of Development Studies*, 38(6): 47–82.

Food and Agriculture Organization (FAO) (2011) *State of Food and Agriculture: Women in Agriculture, Closing the Gender Gap for Development*. Rome: FAO.

Government of Lesotho, Bureau of Statistics (2003) *Household Budget Survey Report, Lesotho, 2002–2003*. Maseru, Lesotho: Bureau of Statistics.

Haddad, L., Hoddinott, J. and Alderman, H. eds. (1997) *Intrahousehold Resource Allocation in Developing Countries: Methods, Models, and Policy*. Baltimore: Johns Hopkins University Press for the International Food Policy Research Institute.

Harvey, A.S., and Taylor, M.E. (2000) Time Use. In M. Grosh and P. Glewwe (eds.), *Designing Household Survey Questionnaires: Lessons from Fifteen Years of the Living Standards Measurement Study*. Washington, DC: The World Bank.

Hausmann, R., Tyson, L., and Zahidi, S. (2011) *The Global Gender Gap Report 2011*. Geneva: World Economic Forum

Holland, J. and Brook, S. (2004) Measuring Empowerment: Country Indicators. In R. Alsop (ed.), *Power, Rights, and Poverty: Concepts and Connections*. Washington, DC: The World Bank.

Ibrahim, S. and Alkire, S. (2007) Agency and empowerment: A Proposal for Internationally Comparable Indicators. *Oxford Development Studies,* 35(4): 379–403.

Kabeer, N. (2001) Reflections on the Measurement of Women's Empowerment: Theory and Practice. In A. Sisask, (ed.), *Discussing Women's Empowerment: Theory and Practice*. Stockholm: Novum Grafiska AB, pp. 17–54.

Kishor, S. and Subaiya, L. (2008)Understanding Women's Empowerment: A Comparative Analysis of Demographic and Health Surveys (DHS) Data. DHS Comparative Reports 20. Calverton, MD: Macro International Inc.

Klasen, S. and Lamanna, F. (2008) The Impact of Gender Inequality in Education and Employment on Economic Growth in Developing Countries: Updates and Extensions. Working Paper No. 175. Ibero-America Institute for Economic Research. Goettigen: University of Goettingen.

Lawson, D. 2012. A Gendered Analysis of Time Poverty. The Importance of Infrastructure. Global Poverty Research Group Working Paper GPRG-WPS-078. London: Economic and Social Research Council-Global Poverty Research Group.

Mahmud, S., Shah, N. M., and Becker, S. (2012) Measurement of Women's Empowerment in Rural Bangladesh. *World Development* 40(3):610–619.

Malhotra, A. and Schuler, S.R. (2005) Women's Empowerment as a Variable in International Development. In D. Narayan (ed.), *Measuring empowerment: Cross-Disciplinary Perspectives.* Washington, DC: The World Bank, pp. 219– 246.

Meinzen-Dick, R. et al. Forthcoming. Gender and Social Capital for Agricultural Development . In A. Quisumbing et al. (eds.) *Gender in Agriculture and Food Security: Closing the Knowledge Gap*. Springer and FAO.

Miller, B.D. (1981) *The Endangered Sex: Neglect of Female Children in Rural North India.* Ithaca: Cornell University Press.

Narayan-Parker, D. (2005) *Measuring Empowerment: Cross-Disciplinary Perspectives.* Washington, DC: World Bank.

Narayan, D. (2002) *Empowerment and Poverty Reduction*. Washington, DC: World Bank.

Narayan, D. and Petesch, P. (2007) *Moving Out of Poverty: Cross-Disciplinary Perspectives on Mobility*. Washington DC: The World Bank.

Peterman, A., Quisumbing, A., Behrman, J., and Nkonya, E. (2011) Understanding the Complexities Surrounding Gender Differences in Agricultural Productivity in Nigeria and Uganda. *Journal of Development Studies*, 47(10): 1482–1509.

Quisumbing, A. R. (ed.) (2003) *Household Decisions, Gender, and Development: A Synthesis of Recent Research*. Washington, DC: IFPRI.

Quisumbing, A.R. and Hallman, K. (2005) Marriage in Transition: Evidence on Age, Education, and Assets from Six Developing Countries. In Lloyd, C. et al. (eds.), *The Changing Transitions to*

Adulthood in Developing Countries: Selected Studies, Panel on Transitions to Adulthood in Developing Countries, Committee on Population, Division of Behavioral and Social Sciences and Education. Washington, DC: National Academies Press.

Quisumbing, A. R. and Kumar, N. (2011) Does social capital build women's assets? The Longterm Impacts of Group-based and Individual Dissemination of Agricultural Technology in Bangladesh. *Journal of Development Effectiveness*, 3(2): 220– 242.

Ryan, R.M. and Deci, E.L. (2000) Self-determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-being. *American Psychologist,* 55(1): 68–78.

Ryan, R. M., and Deci, E. L. (2011) A Self-determination Theory Perspective on Social, Institutional, Cultural, and Economic Supports for Autonomy and Their Importance for Well-being. In V. I. Chirkov, R. M. Ryan and K. M. Sheldon (eds.), *Human Autonomy in Cross-cultural Context: Perspectives on the Psychology of Agency, Freedom, and Well-being*. (pp. 45–64). Dordrecht: Springer.

Ryan, R.M. (ed.) (2011/2012) *The Oxford Handbook of Human Motivation*. Oxford: Oxford University Press.

Sen, A. (1989) Co-operation, Inequality, and the Family. In G. McNicoll and M. Cain (eds.), *Rural Development and Population: Institutions and Policy*, New York: Oxford University Press.

Seymour, G. (2011) Women's Empowerment in Agriculture Index: Report on the International Comparability of the Indicators in the Feed the Future Pilot Test. Unpublished report submitted to the International Food Policy Research Institute. Washington, DC.

Smith, L. C. et al. 2003. *The Importance of Women's Status for Child Nutrition in Developing Countries*. Research Report No.131. Washington, DC: International Food Policy Research Institute.

Szekely, M. (ed.) (2005) *Numbers that Move the World: the Measure of Poverty in Mexico*. Mexico City: Secretaria de Desarrollo Social.

Udry, C. (1996) Gender, Agricultural Production, and the Theory of the Household. *Journal of Political Economy*, 104(5): 1010–1046.

USAID (United States Agency for International Development), IFPRI (International Food Policy Research Institute) and OPHI (Oxford Poverty and Human Development Initiative). (2012) Women's Empowerment in Agriculture Index. http://www.ifpri.org/publication/womens-empowerment-agriculture-index

World Bank (2008) Gender Equality as Smart Economics: World Bank Group Gender Action Plan. First Year Progress Report (January 2007–January 2008) Washington, DC: World Bank.

World Bank (2011) *World Development Report 2012: Gender Equality and Development*. Washington, DC: World Bank.

Annex 1: Tables and Figures

Table 9.1: Bangladesh pilot WEAI

Indexes	Southwestern Bangladesh	
	Women	Men
Disempowered Headcount (H)	**61.0%**	59.8%
Average Inadequacy Score (A)	**41.6%**	33.7%
Disempowerment Index (M0)	**0.254**	0.201
5DE Index (1-M0)	**0.746**	0.799
No. of observations	**436**	338
% of Data used	**96.9%**	96.6%
% of women with no gender parity (H_{GPI})	**40.2%**	
Average Empowerment Gap (I_{GPI})	**25.2%**	
GPI	**0.899**	
No. of women in dual households	**350**	
% of Data Used	**94.6%**	
WEAI	**0.762**	

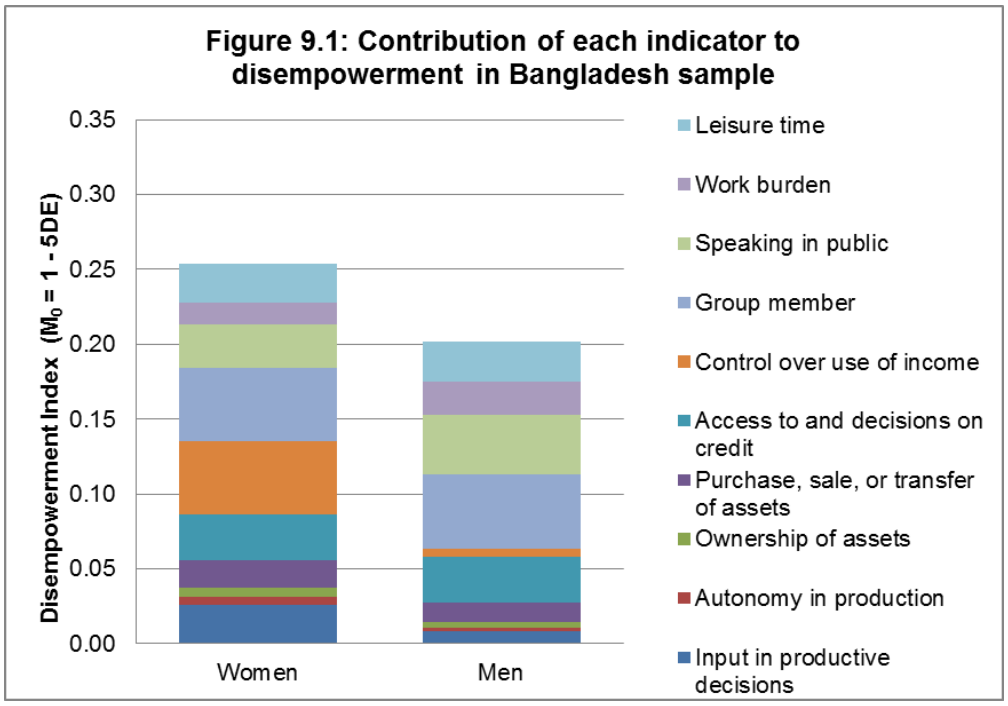

Table 9.2: Guatemala pilot WEAI

Indexes	Western Highlands Guatemala	
	Women	Men
Disempowered Headcount (H)	**71.3%**	39.1%
Average Inadequacy Score (A)	**43.5%**	32.9%
Disempowerment Index (M0)	**0.310**	0.129
5DE Index (1-M0)	**0.690**	0.871
Number of observations	**237**	197
% of Data Used	**67.7%**	71.4%
% of women with no gender parity (H_{GPI})	**64.2%**	
Average Empowerment Gap (I_{GPI})	**29.1%**	
GPI	**0.813**	
No. of women in dual households	**276**	
% of Data Used	**67.8%**	
WEAI	**0.702**	

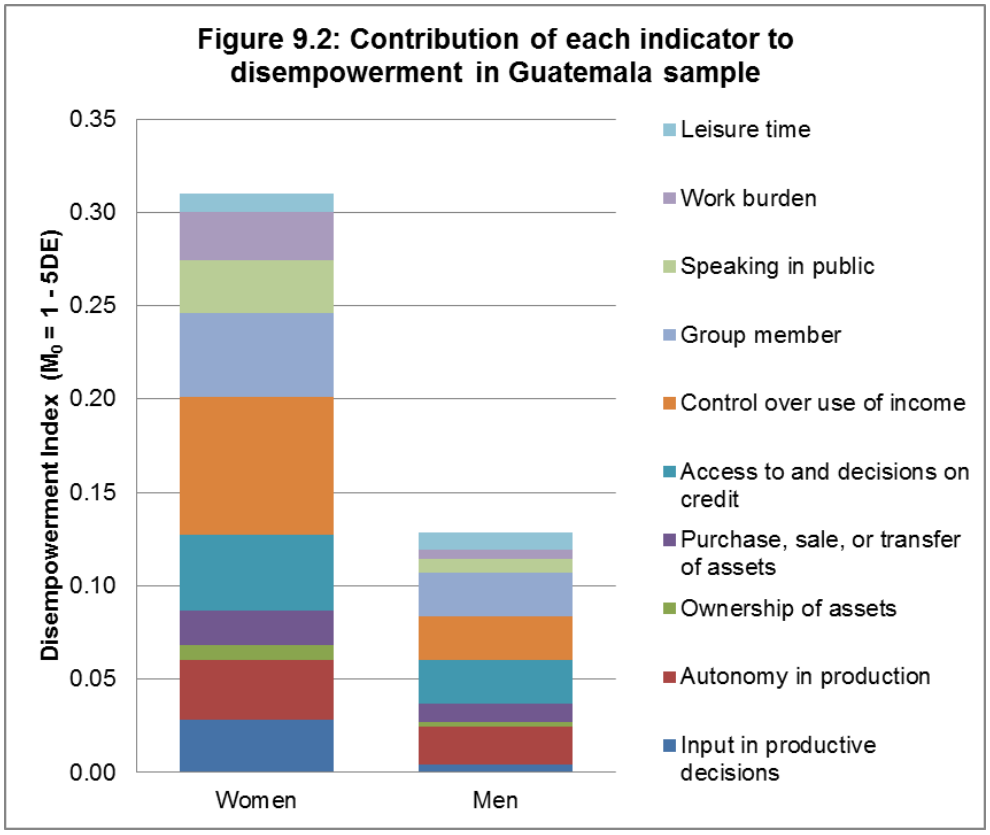

Table 9.3: Uganda pilot WEAI

Indexes	Uganda	
	Women	Men
Disempowered Headcount (H)	**56.7%**	37.0%
Average Inadequacy Score (A)	**37.2%**	32.8%
Disempowerment Index (M0)	**0.211**	0.122
5DE Index (1-M0)	**0.789**	0.878
Number of observations	**335**	262
% of Data Used	**95.7%**	95.3%
% of women with no gender parity (H_{GPI})	**45.6%**	
Average Empowerment Gap (I_{GPI})	**22.4%**	
GPI	**0.898**	
No. of women in dual households	**275**	
% of Data Used	**90.9%**	
WEAI	**0.800**	

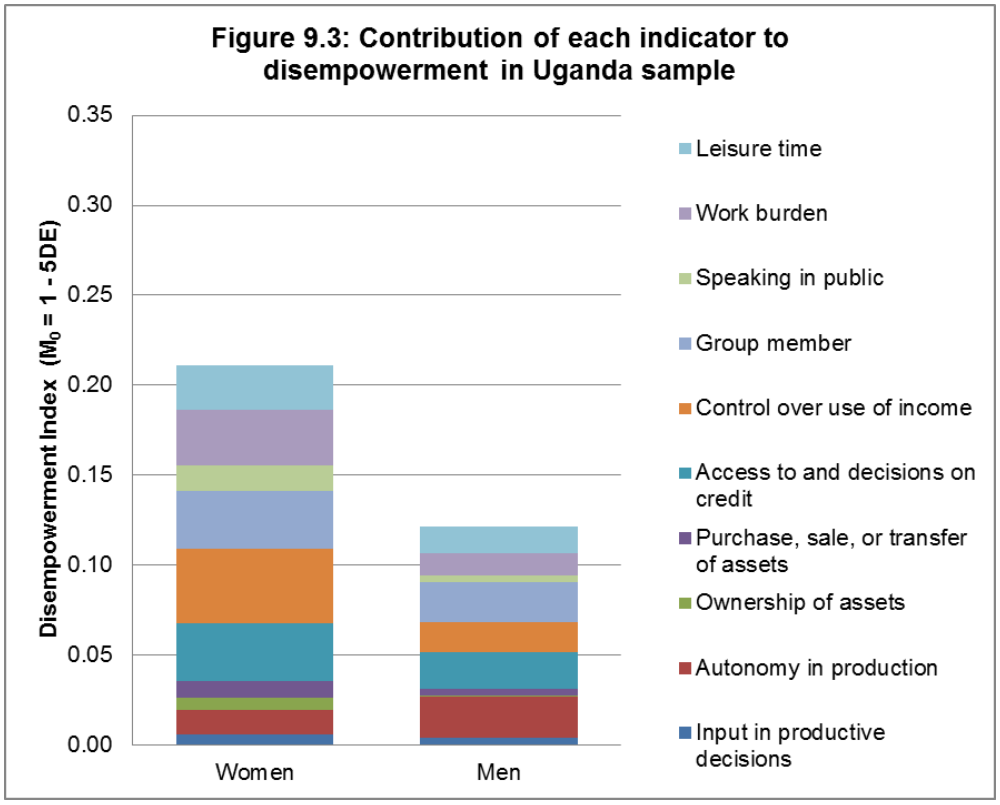

Table 9.4: Bangladesh 5DE Decomposed by Dimension and Indicator

Statistics	Production		Resources			Income	Leadership		Time	
	Input in productive decisions	Autonomy in production	Ownership of assets	Purchase, sale, or transfer of assets	Access to and decisions on credit	Control over use of income	Group member	Speaking in public	Workload	Leisure
WOMEN										
Censored headcount	0.259	0.053	0.092	0.280	0.450	0.248	0.491	0.284	0.147	0.259
% Contribution	10.2%	2.1%	2.4%	7.4%	11.8%	19.5%	19.4%	11.2%	5.8%	10.2%
Contribution	0.026	0.005	0.006	0.019	0.030	0.050	0.049	0.028	0.015	0.026
% Contr. by dimension	12.3%			21.6%		19.5%	30.6%		16.0%	
MEN										
Censored headcount	0.083	0.024	0.053	0.201	0.456	0.027	0.494	0.399	0.225	0.263
% Contribution	4.1%	1.2%	1.8%	6.7%	15.1%	2.6%	24.5%	19.8%	11.2%	13.1%
Contribution	0.008	0.002	0.004	0.013	0.030	0.005	0.049	0.040	0.022	0.026
% Contr. by dimension	5.3%			23.5%		2.6%	44.3%		24.2%	

Table 9.5: Guatemala 5DE Decomposed by Dimension and Indicator

Statistics	Production		Resources			Income	Leadership		Time	
	Input in productive decisions	Autonomy in production	Ownership of assets	Purchase, sale, or transfer of assets	Access to and decisions on credit	Control over use of income	Group member	Speaking in public	Workload	Leisure
WOMEN										
Censored headcount	0.283	0.321	0.122	0.274	0.612	0.367	0.451	0.283	0.257	0.097
% Contribution	9.1%	10.3%	2.6%	5.9%	13.2%	23.7%	14.6%	9.1%	8.3%	3.1%
Contribution	0.028	0.032	0.008	0.018	0.041	0.073	0.045	0.028	0.026	0.010
% Contr. by dimension	19.5%			21.7%		23.7%	23.7%		11.4%	
MEN										
Censored headcount	0.046	0.203	0.036	0.142	0.350	0.117	0.239	0.071	0.051	0.091
% Contribution	3.6%	15.8%	1.8%	7.4%	18.2%	18.2%	18.6%	5.5%	3.9%	7.1%
Contribution	0.005	0.020	0.002	0.009	0.023	0.023	0.024	0.007	0.005	0.009
% Contr. by dimension	19.3%			27.4%		18.2%	24.1%		11.1%	

Table 9.6: Uganda 5DE Decomposed by Dimension and Indicator

Statistics	Production		Resources			Income	Leadership		Time	
	Input in productive decisions	Autonomy in production	Ownership of assets	Purchase, sale, or transfer of assets	Access to and decisions on credit	Control over use of income	Group member	Speaking in public	Work burden	Leisure time
WOMEN										
Censored headcount	0.060	0.131	0.104	0.140	0.487	0.206	0.319	0.146	0.307	0.248
% Contribution	2.8%	6.2%	3.3%	4.4%	15.4%	19.5%	15.1%	6.9%	14.6%	11.7%
Contribution	0.006	0.013	0.007	0.009	0.032	0.041	0.032	0.015	0.031	0.025
% Contr. by dimension	9.0%			23.1%		19.5%	22.1%		26.3%	
MEN										
Censored headcount	0.042	0.225	0.011	0.053	0.309	0.084	0.218	0.038	0.126	0.149
% Contribution	3.5%	18.5%	0.6%	2.9%	17.0%	13.8%	17.9%	3.1%	10.4%	12.3%
Contribution	0.004	0.023	0.001	0.004	0.021	0.017	0.022	0.004	0.013	0.015
% Contr. by dimension	22.0%			20.5%		13.8%	21.0%		22.6%	

Table 10.1: Tabulations between empowerment and individual and household's characteristics - Bangladesh pilot

Characteristics	Women			Men		
Age group	**Empowered**			**Empowered**		
	Yes	No	Missing	Yes	No	Missing
16-25	26	54	1	6	23	2
	32.50	67.50		20.69	79.31	
26-45	107	140	11	77	98	8
	43.32	56.68		44.00	56.00	
46-55	24	34	2	26	32	0
	41.38	58.62		44.83	55.17	
56-65	11	25	0	17	27	2
	30.56	69.44		38.64	61.36	
>65	2	13	0	10	22	0
	13.33	86.67		31.25	68.75	
Total	170	266	14	136	202	12
	38.99	61.01		40.24	59.76	
Cramer's V	0.142			0.147		
Pearson chi2 (statistic and p-value)	8.73	0.068		7.27	0.122	
Fisher's exact (p-value)		0.067			0.118	
Education	**Empowered**			**Empowered**		
	Yes	No	Missing	Yes	No	Missing
Less than primary	103	158	8	76	123	7
	39.46	60.54		38.19	61.81	
Primary	65	103	5	46	70	5
	38.69	61.31		39.66	60.34	
Secondary	2	4	0	10	4	0
	33.33	66.67		71.43	28.57	
University or above	0	1	1	4	5	0
	0.00	100.00		44.44	55.56	
Total	170	266	14	136	202	12
	38.99	61.01		40.24	59.76	
Cramer's V	0.042			0.134		
Pearson chi2 (statistic and p-value)	0.751	0.861		6.093	0.107	
Fisher's exact (p-value)		0.984			0.109	
Wealth Index	**Empowered**			**Empowered**		
	Yes	No	Missing	Yes	No	Missing
1st quintile	20	74	5	13	42	5
	21.28	78.72		23.64	76.36	
2nd quintile	34	51	4	29	39	4
	40.00	60.00		42.65	57.35	
3rd quintile	34	55	1	24	45	1
	38.20	61.80		34.78	65.22	
4th quintile	39	43	1	37	38	2
	47.56	52.44		49.33	50.67	
5th quintile	43	43	3	33	38	0
	50.00	50.00		46.48	53.52	
Total	170	266	14	136	202	12
	38.99	61.01		40.24	59.76	
Cramer's V	0.211			0.181		
Pearson chi2 (statistic and p-value)	19.37	0.001		11.05	0.026	
Fisher's exact (p-value)		0.000			0.024	
Household Hunger Score	**Empowered**			**Empowered**		
	Yes	No	Missing	Yes	No	Missing
Little to no hunger	147	222	13	125	177	11
	39.84	60.16		41.39	58.61	
Moderate hunger	20	38	1	10	24	1
	34.48	65.52		29.41	70.59	
Severe hunger	3	6	0	1	1	0
	33.33	66.67		50.00	50.00	
Total	170	266	14	136	202	12
	38.99	61.01		40.24	59.76	
Cramer's V	0.041			0.075		
Pearson chi2 (statistic and p-value)	0.73	0.695		1.90	0.386	
Fisher's exact (p-value)		0.755			0.354	

10.2: Tabulations between empowerment and answers to decisionmaking and autonomy questions - Bangladesh pilot

Decisionmaking and autonomy questions	Empowered		Phi	Pearson chi2		Fisher's exact	No.	Missing		
	Yes	No	coefficient	Statistic	p-value	p-value	obs.	Emp.	Dec./Aut.	Both
% of WOMEN who feel that can make decisions regarding:										
minor household expenditures	64.12	60.90	0.0323	0.46	0.500	0.544	436	14	0	0
serious health problems	55.88	52.26	0.0355	0.55	0.459	0.491	436	14	0	0
protection from violence	32.94	33.08	0.0014	0.00	0.976	1.000	436	14	0	0
religious faith	74.12	64.66	0.0992	4.29	0.038	0.045	436	14	0	0
daily tasks	83.53	79.70	0.0478	1.00	0.318	0.379	436	14	0	0
family planning	72.94	60.53	0.1273	7.06	0.008	0.010	436	14	0	0
% of WOMEN with RAI above 1 regarding										
minor household expenditures	79.75	74.59	0.0598	1.46	0.227	0.235	407	13	29	1
serious health problems	76.79	72.98	0.0428	0.76	0.383	0.423	416	14	20	0
protection from violence	74.76	64.81	0.1045	2.89	0.089	0.103	265	9	171	5
religious faith	77.44	69.80	0.0842	2.90	0.088	0.091	409	14	27	0
daily tasks	78.92	74.13	0.0547	1.27	0.260	0.295	425	12	11	2
family planning	72.46	69.47	0.0324	0.35	0.557	0.623	328	10	108	4
% of MEN who feel that can make decisions regarding:										
minor household expenditures	68.38	68.81	0.0046	0.01	0.933	1.000	338	12	0	0
serious health problems	64.71	70.79	0.0642	1.39	0.238	0.283	338	12	0	0
protection from violence	58.82	66.34	0.0764	1.98	0.160	0.169	338	12	0	0
religious faith	82.35	83.17	0.0106	0.04	0.845	0.884	338	12	0	0
daily tasks	80.15	79.21	0.0114	0.04	0.834	0.891	338	12	0	0
family planning	55.88	50.99	0.0481	0.78	0.377	0.437	338	12	0	0
% of MEN with RAI above 1 regarding										
minor household expenditures	90.84	85.64	0.0777	1.97	0.161	0.173	326	11	12	1
serious health problems	89.23	88.54	0.0107	0.04	0.847	1.000	322	12	16	0
protection from violence	91.51	86.71	0.0741	1.45	0.228	0.244	264	11	74	1
religious faith	86.26	85.42	0.0118	0.05	0.831	0.872	323	12	15	0
daily tasks	89.52	86.46	0.0454	0.65	0.420	0.486	316	11	22	1
family planning	83.49	84.00	0.0069	0.01	0.912	1.000	259	9	79	3

Table 10.3: Tabulations between empowerment and individual and household's characteristics - Guatemala pilot

Characteristics	Women			Men		
Age group	**Empowered**			**Empowered**		
	Yes	No	Missing	Yes	No	Missing
16-25	3	29	19	9	5	7
	9.38	90.63		64.29	35.71	
26-45	45	77	54	62	45	41
	36.89	63.11		57.94	42.06	
46-55	11	27	22	27	10	12
	28.95	71.05		72.97	27.03	
56-65	4	24	11	13	10	12
	14.29	85.71		56.52	43.48	
>65	5	12	7	9	7	7
	29.41	70.59		56.25	43.75	
Total	68	169	113	120	77	79
	28.69	71.31		60.91	39.09	
Cramer's V	0.231			0.125		
Pearson chi2 (statistic and p-value)	12.68	0.013		3.06	0.549	
Fisher's exact (p-value)		0.009			0.540	
Education	**Empowered**			**Empowered**		
	Yes	No	Missing	Yes	No	Missing
Less than primary	51	143	92	83	59	59
	26.29	73.71		58.45	41.55	
Primary	10	16	18	28	15	17
	38.46	61.54		65.12	34.88	
Secondary	1	0	0	1	0	0
	100.00	0.00		100.00	0.00	
University or above	0	0	0	0	0	2
Total	62	159	110	112	74	78
	28.05	71.95		60.22	39.78	
Missing information	6	10	3	8	3	1
Cramer's V	0.139			0.083		
Pearson chi2 (statistic and p-value)	4.259	0.119		1.276	0.528	
Fisher's exact (p-value)		0.112			0.687	
Wealth Index	**Empowered**			**Empowered**		
	Yes	No	Missing	Yes	No	Missing
1st quintile	12	40	25	17	18	11
	23.08	76.92		48.57	51.43	
2nd quintile	12	31	19	24	13	21
	27.91	72.09		64.86	35.14	
3rd quintile	13	31	23	24	19	14
	29.55	70.45		55.81	44.19	
4th quintile	13	30	27	22	10	20
	30.23	69.77		68.75	31.25	
5th quintile	18	37	19	33	17	13
	32.73	67.27		66.00	34.00	
Total	68	169	113	120	77	79
	28.69	71.31		60.91	39.09	
Cramer's V	0.075			0.148		
Pearson chi2 (statistic and p-value)	1.32	0.858		4.32	0.364	
Fisher's exact (p-value)		0.855			0.376	
Household Hunger Score	**Empowered**			**Empowered**		
	Yes	No	Missing	Yes	No	Missing
Little to no hunger	60	130	81	93	65	60
	31.58	68.42		58.86	41.14	
Moderate hunger	6	32	24	21	10	14
	15.79	84.21		67.74	32.26	
Severe hunger	0	5	6	3	1	5
	0.00	100.00		75.00	25.00	
Total	66	167	111	117	76	79
	28.33	71.67		60.62	39.38	
Missing information	2	2	2	3	1	0
Cramer's V	0.159			0.079		
Pearson chi2 (statistic and p-value)	5.91	0.052		1.21	0.546	
Fisher's exact (p-value)		0.066			0.560	

10.4: Tabulations between empowerment and answers to decisionmaking and autonomy questions - Guatemala pilot

Decisionmaking and autonomy questions	Empowered		Phi	Pearson chi2		Fisher's exact	No.	Missing information		
	Yes	No	coefficient	Statistic	p-value	p-value	obs.	Emp.	Dec./Aut.	Both
% of WOMEN who feel that can make decisions regarding:										
minor household expenditures	93.75	85.80	0.1104	2.75	0.097	0.114	226	86	11	27
serious health problems	82.09	74.23	0.0842	1.63	0.202	0.233	230	103	7	10
protection from violence	81.54	78.53	0.0336	0.26	0.612	0.718	228	99	9	14
religious faith	87.88	83.13	0.0591	0.81	0.368	0.427	232	97	5	16
daily tasks	89.23	85.19	0.0533	0.64	0.422	0.524	227	100	10	13
family planning	86.00	77.78	0.0913	1.54	0.214	0.301	185	85	52	28
% of WOMEN with RAI above 1 regarding										
minor household expenditures	79.37	50.63	0.2636	15.35	0.000	0.000	221	91	16	22
serious health problems	75.76	50.00	0.2356	12.77	0.000	0.000	230	104	7	9
protection from violence	77.27	46.39	0.2802	18.22	0.000	0.000	232	98	5	15
religious faith	69.70	38.69	0.2794	18.27	0.000	0.000	234	102	3	11
daily tasks	79.10	46.34	0.2994	20.71	0.000	0.000	231	102	6	11
family planning	76.00	47.06	0.2578	12.36	0.000	0.000	186	88	51	25
% of MEN who feel that can make decisions regarding:										
minor household expenditures	84.35	78.87	0.0696	0.90	0.342	0.430	186	71	11	8
serious health problems	84.87	89.33	0.0637	0.79	0.375	0.517	194	75	3	4
protection from violence	99.17	93.42	0.1625	5.18	0.023	0.033	196	71	1	8
religious faith	93.22	94.81	0.0322	0.20	0.653	0.767	195	71	2	8
daily tasks	98.31	94.81	0.0991	1.91	0.167	0.215	195	72	2	7
family planning	84.26	94.20	0.1500	3.98	0.046	0.057	177	66	20	13
% of MEN with RAI above 1 regarding										
minor household expenditures	65.52	39.44	0.2548	12.14	0.000	0.001	187	69	10	10
serious health problems	63.87	42.67	0.2078	8.38	0.004	0.005	194	72	3	7
protection from violence	63.03	43.42	0.1923	7.21	0.007	0.008	195	73	2	6
religious faith	63.87	36.36	0.2691	14.20	0.000	0.000	196	71	1	8
daily tasks	65.00	36.84	0.2753	14.86	0.000	0.000	196	73	1	6
family planning	64.81	39.06	0.2503	10.78	0.001	0.001	172	65	25	14

Table 10.5: Tabulations between empowerment and individual and household's characteristics - Uganda pilot

Characteristics	Women			Men		
Age group	**Empowered**			**Empowered**		
	Yes	No	Missing	Yes	No	Missing
16-25	15	32	2	13	19	3
	31.91	68.09		40.63	59.38	
26-45	67	89	7	83	45	7
	42.95	57.05		64.84	35.16	
46-55	31	24	1	27	11	1
	56.36	43.64		71.05	28.95	
56-65	19	23	2	26	13	0
	45.24	54.76		66.67	33.33	
>65	13	22	3	16	9	2
	37.14	62.86		64.00	36.00	
Total	145	190	15	165	97	13
	43.28	56.72		62.98	37.02	
Cramer's V	0.144			0.179		
Pearson chi2 (statistic and p-value)	6.96	0.138		8.09	0.088	
Fisher's exact (p-value)		0.143			0.091	
Education	**Empowered**			**Empowered**		
	Yes	No	Missing	Yes	No	Missing
Less than primary	97	145	12	70	57	5
	40.08	59.92		55.12	44.88	
Primary	46	43	3	82	37	6
	51.69	48.31		68.91	31.09	
Secondary	0	0	0	5	2	1
	0.00	0.00		71.43	28.57	
University or above	1	0	0	5	1	1
	100.00	0.00		83.33	16.67	
Technical or vocation	1	0	0	3	0	0
	100.00	0.00		100.00	0.00	
Total	145	188	15	165	97	13
	43.54	56.46		62.98	37.02	
Missing information	0	2	0	0	0	0
Cramer's V	0.136			0.177		
Pearson chi2 (statistic and p-value)	6.172	0.104		8.204	0.084	
Fisher's exact (p-value)		0.045			0.089	
Wealth Index	**Empowered**			**Empowered**		
	Yes	No	Missing	Yes	No	Missing
1st quintile	22	48	3	32	17	1
	31.43	68.57		65.31	34.69	
2nd quintile	24	43	3	31	18	4
	35.82	64.18		63.27	36.73	
3rd quintile	22	40	3	32	25	2
	35.48	64.52		56.14	43.86	
4th quintile	30	37	4	28	20	3
	44.78	55.22		58.33	41.67	
5th quintile	47	22	2	42	17	3
	68.12	31.88		71.19	28.81	
Total	145	190	15	165	97	13
	43.28	56.72		62.98	37.02	
Cramer's V	0.270			0.114		
Pearson chi2	24.46	0.000		3.41	0.492	
Fisher's exact		0.000			0.493	
Household Hunger Score	**Empowered**			**Empowered**		
	Yes	No	Missing	Yes	No	Missing
Little to no hunger	123	129	12	136	71	13
	48.81	51.19		65.70	34.30	
Moderate hunger	17	40	3	20	17	0
	29.82	70.18		54.05	45.95	
Severe hunger	5	18	0	6	9	0
	21.74	78.26		40.00	60.00	
Total	145	187	15	162	97	13
	43.67	56.33		62.55	37.45	
Missing information	0	3	0	3	0	0
Cramer's V	0.187			0.143		
Pearson chi2	11.64	0.003		5.27	0.072	
Fisher's exact		0.003			0.072	

10.6: Tabulations between empowerment and answers to decisionmaking and autonomy questions - Uganda pilot

Decisionmaking and autonomy questions	Empowered		Phi	Pearson chi2		Fisher's exact	No.	Missing		
	Yes	No	coefficient	Statistic	p-value	p-value	obs.	Emp.	Dec./Aut.	Both
% of WOMEN who feel that can make decisions regarding:										
minor household expenditures	85.52	81.91	0.0481	0.77	0.380	0.457	333	11	2	4
serious health problems	86.90	75.40	0.1437	6.85	0.009	0.012	332	9	3	6
protection from violence	94.78	82.93	0.1784	8.88	0.003	0.003	279	8	56	7
religious faith	95.83	87.37	0.1466	7.18	0.007	0.007	334	10	1	5
daily tasks	100.00	94.12	0.1630	8.82	0.003	0.003	332	10	3	5
family planning	84.48	70.27	0.1664	3.66	0.056	0.065	132	5	203	10
% of WOMEN with RAI above 1 regarding										
minor household expenditures	78.47	65.78	0.1391	6.41	0.011	0.014	331	11	4	4
serious health problems	80.00	62.96	0.1849	11.42	0.001	0.001	334	11	1	4
protection from violence	72.13	59.15	0.1344	5.16	0.023	0.025	286	10	49	5
religious faith	79.31	64.55	0.1612	8.67	0.003	0.004	334	11	1	4
daily tasks	80.69	70.05	0.1213	4.89	0.027	0.031	332	11	3	4
family planning	78.18	69.86	0.0932	1.11	0.291	0.319	128	4	207	11
% of MEN who feel that can make decisions regarding:										
minor household expenditures	78.18	71.88	0.0711	1.32	0.251	0.294	261	9	1	4
serious health problems	95.65	87.63	0.1488	5.71	0.017	0.025	258	12	4	1
protection from violence	98.16	87.50	0.2204	12.58	0.000	0.001	259	12	3	1
religious faith	96.93	90.72	0.1331	4.60	0.032	0.045	260	12	2	1
daily tasks	95.73	89.47	0.1218	3.84	0.050	0.067	259	12	3	1
family planning	81.91	86.67	0.0598	0.50	0.481	0.627	139	4	123	9
% of MEN with RAI above 1 regarding										
minor household expenditures	43.04	31.18	0.1176	3.47	0.062	0.081	251	9	11	4
serious health problems	41.36	29.47	0.1188	3.63	0.057	0.062	257	11	5	2
protection from violence	42.86	33.33	0.0943	2.29	0.130	0.147	257	11	5	2
religious faith	38.13	28.13	0.1019	2.66	0.103	0.135	256	11	6	2
daily tasks	42.86	27.66	0.1516	5.86	0.015	0.016	255	11	7	2
family planning	50.00	35.56	0.1368	2.53	0.112	0.143	135	4	127	9

Annex 2.1: 5DE Indicator Definitions

Dimension	Indicator name	Survey questions	Variable(s)	Aggregation method	Deprivation cutoff	Deprivation cutoff definition	Weight
Production	Input in productive decisions	How much input did you have in making decisions about: food crop farming, cash crop farming, livestock raising, fish culture? To what extent do you feel you can make your own personal decisions regarding these aspects of household life if you want(ed) to: agriculture production, what inputs to buy, what types of crops to grow for agricultural production, when or who would take crops to market, livestock raising?	B02 1-3,6 G02 A-E	Achievement in two	Inadequate if individual participates BUT does not have at least some input in decisions; or she does not make the decisions nor feels she could.	B01==1 & B02==1, ((G01!=1 & A05==1) & (G01!=2 & A05==2)) & G02==1	0.10
	Autonomy in production	My actions in [DOMAIN] are partly because I will get in trouble with someone if I act differently. Regarding [DOMAIN] I do what I do so others don't think poorly of me. Regarding [DOMAIN] I do what I do because I personally think it is the right thing to do. Domains: agricultural production, inputs to buy, crops to grow, take to market, livestock.	G03-G05 A-E	Achievement in any	Inadequate if RAI below 1		0.10
Resources	Ownership of assets	Who would you say can use the [ITEM] most of the time? Items: agricultural land, large livestock, small livestock, chicks etc; fish pond/equipment; farm equipment (non-mechanized); farm equipment (mechanized); nonfarm household business equipment; large durables; small durables; cell phone; non-ag land (any); transport.	C03 A-N	Achievement in any if has more than one small asset (chickens, non-mechanized equipment and small consumer durables)	Inadequate if household does not own any asset or if household owns the type of asset BUT she/he does not own most of it alone	C01a==1 & (C02!=1, 3, 5, 7, 9)	0.07
	Purchase, sale, or transfer of assets	Who would you say can decide whether to sell, give away, rent/mortgage [ITEM] most of the time? Who contributes most to decisions regarding a new purchase of [ITEM]? Items: agricultural land; large livestock, small livestock; chicks, etc; fish pond; farm equipment (non-mechanized); farm equipment (mechanized).	C04-C06 A-G, C09 A-G	Achievement in any if not only chickens and farming equipment non-mechanized	Inadequate if household does not own any asset or household owns the type of asset BUT she does not participate in the decisions (exchange or buy) about it	C01a==1 & (C04!=1,3, 5,7, 9) & (C05!=1,3, 5,7, 9) & (C06!=1,3, 5,7, 9)& (C09!=1,3, 5,7, 9)	0.07
	Access to and decisions on credit	Who made the decision to borrow/what to do with money/item borrowed from [SOURCE]? Sources: non-governmental organization (NGO); informal lender; formal lender (bank); friends or relatives; ROSCA (savings/credit group).	C11-C12 A-E	Achievement in any	Inadequate if household has no credit OR used a source of credit BUT she/he did not	C10<=3 & (C11!=1, 3, 5, 7, 9) & (C12!=1, 3, 5, 7, 9)	0.07

					participate in ANY decisions about it		
Income	Control over use of income	How much input did you have in decisions on the use of income generated from: food crop, cash crop, livestock, non-farm activities, wage & salary, fish culture; 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?	B03 1-6, G02 G-H	Achievement in any if not only minor household expenditures	Inadequate if participates in activity BUT has no input or little input on decisions about income generated	B01==1 & B03==1, ((G01!=1 & A05==1) & (G01!=2 & A05==2)) & G02==1	0.20
Leadership	Group member	Are you a member of any: agricultural / livestock/ fisheries producer/market group; water group; forest users' group; credit or microfinance group; mutual help or insurance group (including burial societies); trade and business association; civic/charitable group; local government; religious group; other women's group; other group	E07 A-K	Achievement in any	Inadequate if is not part of AT LEAST ONE group	E07==2	0.10
	Speaking in public	Do you feel comfortable 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 other similar programs? To protest the misbehavior of authorities or elected officials? To intervene in case of a family dispute?	E02 A-C	Achievement in any	Inadequate if not comfortable speaking in public		0.10
Time	Workload	Worked more than 10.5 hours in previous 24 hours.	F01		Inadequate if works more than 11 hours a day		0.10
	Leisure	How would you rate your satisfaction with your available time for leisure activities like visiting neighbors, watching TV, listening to radio, seeing movies or doing sports?	F04B		Inadequate if not satisfied (<5)	F01B<5	0.10