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The Women's Empowerment in Agriculture Index

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Summary. — The Women's Empowerment in Agriculture Index (WEAI) measures the empowerment, agency, and inclusion of women in the agricultural sector and comprises two subindexes. The first assesses empowerment of women in five domains, including (1) decisions about agricultural production, (2) access to and decisionmaking power about productive resources, (3) control of use of income, (4) leadership in the community, and (5) time allocation. The second subindex measures the percentage of women whose achievements are at least as high as men in their households and, for women lacking parity, the relative empowerment gap with respect to the male in their household. This article documents the development of the WEAI and presents pilot findings from Bangladesh, Guatemala, and Uganda.

Key words — agricultural development, multidimensional measurement, gender equality, women's empowerment

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 not only are goals in themselves but have been shown to contribute to improving productivity and increasing efficiency. The Food and Agriculture Organization's (FAO) (2011) *The State of Food and Agriculture: 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 (2011) *World Development Report 2012: 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.

While the concept of "equality" is intuitively easy to understand, "empowerment" is a broad concept that is used differently by various writers, depending on the context or circumstance. Indeed, one can argue that many policy reports, such as those of the FAO and World Bank cited above, make explicit links between gender equality and development outcomes, not necessarily between *empowerment* and desired outcomes. This is partly attributable to the difficulty of measuring empowerment.

Although empowerment is intrinsically experienced by individuals, existing indices of empowerment and gender are typically measured at the aggregate country level. For example the Organisation for Economic Co-operation and

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Development's (OECD) Social Institutions and Gender Index (SIGI) is a measure of gender equality which focuses upon five legal and social institutions and is used to rank countries. 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), are useful for characterizing progress toward gender equality, but, as proxy indicators, do not provide direct measures of *individual* empowerment outcomes. Similarly, the Gender Gap Index (Hausmann, Tyson, & Zahidi, 2012 and previous years), the Gender Development Index (GDI), and the Gender Inequality Index (GII) that were/are reported by the United Nations Development Programme (UNDP) Human Development Reports, cover gender inequalities in a broad set of domains but do not measure empowerment directly; and in the case of GDI, wage data were largely imputed (UNDP, 2010). A notable methodological weakness is that these, as well as the Gender Empowerment Measure (GEM), all use aggregate data hence cannot be decomposed by age, region, or other social groups. Nowhere are there existing indices that capture control over resources or agency within the agricultural sector, in which women account for 43% of the agricultural labor force in developing countries (FAO, 2011). In sum, existing measures of empowerment are limited in several ways (Alkire, 2005; Alsop, Bertelsen, & Holland, 2006; Kishor & Subaiya, 2008; Narayan, 2005).

In sharp contrast to these, the Women's Empowerment in Agriculture Index (WEAI) builds up a multidimensional empowerment profile for each man and woman that reflects their overlapping achievements in different domains, and aggregates these. As a result, the WEAI reflects the overlapping kinds of agency at the individual level; it can also be broken down by subnational region, by age, by social group, as well as by each indicator. A novel Gender Parity Index reflects intra-household inequality in these same profiles. The WEAI's indicators are also unique: nationally representative surveys such as some demographic and health surveys (DHS) include a range of questions about decisionmaking within the household, but these are typically confined to the domestic sphere and do not encompass decisions in the productive and economic spheres, nor do the surveys have identical questions for men and women. WEAI's originality lies both in its measurement methodology and in its tailor-made surveys. Why this construction?

Despite the renewed interest in the agricultural sector as an engine of growth and development and greater recognition of the importance of women in agriculture, existing tools for measuring the impact of agricultural interventions on women's empowerment are limited. Without such tools, the impacts of programs on empowerment 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, comparable over time and space, multidimensional, and able to measure and monitor the impact of agricultural interventions on women's empowerment. Indexes 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 little coverage of the agricultural sector, whereas 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 & Subaiya, 2008; Malhotra & Schuler, 2005).

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 monitor women's empowerment that may result from the US government's Feed the Future Initiative, which commissioned the development of WEAI. Feed the Future is the United States Government's global hunger and food security initiative, which supports country-driven approaches to address the root causes of hunger and poverty and forge long-term solutions to chronic food insecurity and undernutrition. Working in 19 countries, with a focus on smallholder farmers, Feed the Future supports partner countries in developing their agriculture sectors to spur economic growth that increases incomes and reduces hunger, poverty, and undernutrition. [1] The focus on inclusive agricultural growth within the Feed the Future Initiative was one of the primary reasons for the development of the WEAI.

The WEAI can be adapted to measure empowerment of women in rural areas more generally, whether they are farmers, agricultural or non-agricultural wage workers, or engaged in non-farm businesses. With suitable modification to the indicators of production and resources, the five dimensions are relevant to rural women, regardless of occupation. The WEAI or adaptations of it can also be used more generally to assess the state of empowerment and gender parity in agriculture (or in other domains), 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 (for example, Alsop *et al*., 2006; Ibrahim & Alkire, 2007; Narayan, 2005; Narayan, Pritchett, & Kapoor, 2009) that propose domain-specific measures of empowerment obtained using individual or household surveys. Based on the Alkire–Foster methodology (Alkire & Foster, 2011 a,b; Alkire & Santos 2010), WEAI is an aggregate index that can be broken down in many ways. It is reported at the country or regional level, based on individual-level data collected by interviewing men and women within the same households.

The WEAI 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 pilot survey—with household and individual questionnaires, administered to a primary male and a primary female respondent in each household [2]—was implemented from September to November 2011 in Feed the Future zones of influence in Bangladesh, Guatemala, and Uganda. 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.

This paper presents the rationale for the structure of the Index, based on the definition of key domains of empowerment in agriculture and gender equality, describes the methodology underlying its construction as a type of multidimensional index, discusses results from a three-country pilot, and explores correlations with other variables commonly associated with empowerment. It concludes by pointing out limitations of the current indicators and suggests ways by which the index may be improved in future work.

2. BACKGROUND: MEASURING WOMEN'S EMPOWERMENT IN AGRICULTURE

(a) *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 his or her life experiences, personality, and aspirations. Naturally, context and culture also shape one's definition of empowerment. Reflecting the multiple experiences and views of empowerment, there are many definitions of empowerment in the literature (see Ibrahim & Alkire, 2007 for a comprehensive review). Three definitions that are commonly cited are found in Kabeer (1999), Alsop *et al*. (2006) and Narayan (2002). Kabeer (1999) defines empowerment as expanding people's ability to make strategic life choices, particularly in contexts in which this ability had been denied to them. Kabeer (1999) argues further that there is a gap between the understanding of empowerment as a *process*, and more instrumentalist forms of advocacy that have required the measurement and quantification of empowerment. In Kabeer's definition, the ability to exercise choice encompasses three dimensions: resources (defined to include not only access but also future claims to material, human, and social resources), agency (including processes of decisionmaking, negotiation, and even deception and manipulation), and achievements (well-being outcomes). The WEAI focuses on the "agency" aspect as it is far less studied than resources such as income, or achievements such as educational levels—and as Section 7 shows, tells interestingly different stories.

Alsop *et al*. describe 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" (2006, p. 10). This definition has two components—the component related to Amartya Sen's (1989) 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 (Alkire, 2008; Ibrahim & Alkire, 2007). Narayan 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" (2002, p. vi, 2005, p. 5), 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 wherein community and mutuality are valued. Both Kabeer and Alsop also include agency and capability—the ability to act on one's choices. Narayan's definition is broader as it includes the relationship between people and institutions. 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, and economic power, the focus of WEAI is on those aspects of empowerment that relate directly to agriculture—an area that has been relatively neglected in studies of empowerment.

(b) *Measuring empowerment in agriculture: The five domains of empowerment (5DE) in agriculture*

Because agency and empowerment are experienced with different tasks and can be described and measured with different domains, Alkire (2005) suggests that most measures of agency and empowerment should be domain specific. For WEAI, the United States Agency for International Development (USAID) initially defined five domains which reflected priorities of agricultural programs. These include (1) decisions about agricultural production, (2) access to and decisionmaking power about productive resources, (3) control of use of income, (4) leadership in the community, and (5) time allocation.

These domains also reflect aspects of empowerment found in the literature. The first domain follows directly from Kabeer's (1999) or Alsop *et al*.'s (2006) definitions of empowerment as 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: A woman may decide to plant trees, but if she does not have rights to the land or credit to purchase inputs, she may not be able to do so. Thus, the resource domain combines both whether the woman can potentially make decisions over the asset—because her household possesses it—and whether in fact she has the agency to use it. Control over income is a key domain for exercising choice, and it reflects whether a person is able to benefit from her or his efforts. This is especially important in agriculture because often even where women produce crops or livestock, they are marketed by men who then keep most of the income. Tracking this component of the WEAI could help monitor changes in control of income, perhaps owing to integration into value chains. The leadership domain captures key aspects of inclusion and participation, accountability, and local organizational capacity, which Narayan (2002) cites as key elements of empowerment. It is measured at the individual level, because even if opportunities exist for women to exercise leadership within the community, an individual may not necessarily be able to take advantage of such opportunities—for example, if family members object to her participation in groups or in political activities. Finally, 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. 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. Labor-saving technologies that reduce the time women need to spend on domestic work may also give them more time for other activities—choices which are empowering if these options had not been available in the past. 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 10 indicators with their corresponding weights, which the remainder of this section introduces (see Table 1). Full definitions of the indicators, based on the original survey questions, are provided in the appendix. Each indicator is used to show whether each individual reached a certain threshold (has "adequate" achievement) in that area.

(i) *Production*

This domain concerns decisions about agricultural production and refers to sole or joint decisionmaking about food and cash crop farming, livestock and fisheries, and autonomy in agricultural production, with no judgment on whether sole or joint decisionmaking better reflects greater empowerment. Two indicators are used. The first, input in productive decisions, is constructed from answers regarding: (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 and (2) the extent to which the individual feels he or she can make his or her own personal decisions about the following aspects of household life if he or she wanted to: (a) agricultural production, (b) which inputs to buy, (c) which types of crops to grow for agricultural production, (d) when to take 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

Table 1. *The domains, indicators, and weights in the Women's Empowerment in Agriculture Index*

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 about 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

Source: Authors.

at least some input in decisions or if someone else makes the decisions but the individual feels he or she could. [3]

The second indicator of autonomy reflects a person's ability to act on what he or she values. This indicator probes the person's own understanding of the situation and how he or she balances different motivations—to avoid punishment or social disapproval and to act on his or her own values (Alkire, 2007). The indicator adapts the measure of autonomy developed by psychologists (Chirkov, Ryan, & Deci, 2011; Ryan and Deci 2000, 2011). A subindex is constructed as a weighted sum of answers to the following: (1) My actions in [area of decisionmaking] are partly because I will get in trouble with someone if I act differently (*weight* = −2), (2) so others do not think poorly of me (*weight* = −1), and (3) because I personally think it is the right thing to do (*weight* = +3). The areas of autonomy refer to (1) agricultural production, (2) which inputs to buy, (3) which types of crops to grow, (4) when to take or who would take crops to market, and (5) livestock production. The responses vary from 1 to 4 depending if a statement is always, somewhat, not-very, or never true. An individual has adequate autonomy if his or her actions are relatively more motivated by his or her own values than by coercion or fear of others' disapproval. This autonomy indicator, unlike decisionmaking, captures the situation of women living in female-only households, who may indeed be empowered as sole decisionmakers but whose autonomy may still be deeply constrained by social norms or force of circumstance. It also distinguishes situations in joint households where a "joint" decision may be more or less autonomous, depending on circumstances.

(ii) *Resources*

This domain concerns ownership of, access to, and decisionmaking power about productive resources such as land, livestock, agricultural equipment, consumer durables, and credit. 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 about 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 (that is, not including poultry, non-mechanized equipment, or small consumer durables). [4] Although some might argue that sole ownership is more indicative of empowerment than joint ownership, women can be more empowered if they jointly own a valuable asset (land) than if they have sole ownership of a minor asset (a chicken).

The second indicator, defined with similar assets, asks who makes 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. A person has adequacy in this area if he or she participates (or *can* participate) in decisions to buy, sell, or transfer the asset, conditional on the household's owning it.

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

(iii) *Income*

This domain concerns sole or joint control over the use of income and expenditures. The single indicator for this dimension measures the degree of input into decisions about the use of income generated from the productive/income-generating activities mentioned above as well as the extent to which the individual feels he or she can make his or her own personal decisions regarding wage or salary employment. A person is considered adequate if he or she has input into decisions about income generated, conditional on participation in the activity.

(iv) *Leadership*

The fourth domain concerns leadership in the community, here measured by membership in economic or social groups and comfort speaking in public. Recognizing the value of social capital as a resource, membership shows whether the person is a member of at least one social or economic group, including (1) agriculture producers' or marketing groups, (2) water users' groups, (3) forest users' groups, (4) credit or microfinance groups; (5) mutual help or insurance groups (including burial societies), (6) trade and business associations, (7) civic or charitable groups, (8) local government groups, (9) religious groups, and (10) other women's groups. 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, Behrman, Pandolfelli, Peterman, & Quisumbing, 2013).

Whether the person is comfortable speaking up in public consists of responses to questions about the person's ease in speaking up in public to help decide on infrastructure (like small wells, roads) to be built, to ensure proper payment of wages for public work or similar programs, and to protest the misbehavior of authorities. The respondent is considered adequate in speaking in public if he or she is comfortable speaking in public for at least one of these issues.

Although it does not cover the entire range of possibilities for public engagement, this variable provides some indication of the respondent's agency in exerting voice and engaging in collective action.

(v) *Time*

The final domain concerns the allocation of time to productive and domestic tasks and satisfaction with the time available

for leisure activities. The first indicator, productive and domestic workload, is derived from a detailed 24-hour time allocation module based on the Lesotho Time Budget Study (Government of Lesotho, 2003).[5] Respondents are asked to recall the time spent on primary and secondary activities during the previous 24 hours. During the interview, the respondent is allowed to mention up to two activities that he or she may be doing simultaneously (for example, taking care of a child while cooking), and the respondent identifies which is the primary and which is the secondary activity. The individual is considered inadequate (having 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 in work-related tasks in the primary activity plus 50% of the time in work-related tasks for the secondary activity.[6]

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

Each person is given a binary score in each of the 10 indicators, reflecting whether she has adequate or inadequate achievements in each indicator. An empowerment score is then generated for her, in which the weights of those indicators in which she enjoys adequacy are summed to create a score that lies between 0% and 100%. All in all, a woman or man is defined as empowered in 5DE if she or he has adequate achievements in four of the five domains or is empowered in some combination of the weighted indicators that reflect 80% total adequacy or more. The rationale behind the choice of the 80% cut-off for determining total adequacy is discussed in the Computing 5DE section.

(c) *Women's empowerment and gender parity*

Although 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 households, the index would be missing an important piece that contributes to disempowerment or conversely to empowerment: gender equality. A large body of evidence now demonstrates that failing to pay attention to intrahousehold gender inequality has costs for attaining development objectives (see Alderman, Chiappori, Haddad, Hoddinott, & Kanbur, 1995; Haddad, Hoddinott, & Alderman, 1997; Quisumbing, 2003).

Intrahousehold inequality has specifically been shown to have costs for 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. Interventions 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 although many development programs have succeeded in increasing women's assets, in programs that do not deliberately target women, men's assets also increase and do so faster than women's assets, resulting in growing gender asset inequality within the same household (Quisumbing & Kumar, 2011).

Thus, an important innovation of WEAI is that it also contains a measure of gender parity, based on differences in empowerment between the primary male and primary female adult 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 decisionmakers 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 GPI. GPI shows the percentage of women who achieve parity with their male counterparts. In cases of gender disparity, GPI reflects the relative empowerment gap between the female's 5DE score and the male's. GPI can thus be increased either by increasing the percentage of women who enjoy gender parity or, for those women who are less empowered than the male in their household, by reducing the empowerment gap between the male and female of the same household.

3. WEAI AS A MULTIDIMENSIONAL INDEX

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. WEAI seeks to be accurate enough for use at disaggregated levels (Szekely, 2005). WEAI is intended to provide a simple, intuitive, and visible headline figure that can be compared across places and across times.

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. WEAI has a multidimensional internal structure but communicates it simply. The 5DE conveys the percentage of women who are empowered and the intensity of disempowerment. GPI shows the percentage of women who enjoy gender parity and the gap between women and men. These numbers can also be compared by groups and will show changes over time and provide incentives to reduce both the incidence and intensity of disempowerment. Similarly, the GPI creates incentive to reduce both the incidence of disparity between women and men and the gap.

The Alkire–Foster methodology was used because it not only underlies a headline figure and intuitive partial indexes, but also enables readers to break the headline figure into its 10 indicators to show women's achievements in each indicator and domain, thereby identifying the areas requiring improvement. Simply put, the 5DE index immediately enables readers to understand *how* women (and men) are empowered and disempowered.

Another innovative feature of WEAI is 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 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. Both 5DE and GPI can be further broken down by regions, ethnic affiliations, household types, and other variables to compare empowerment and gender equity across population groups.

In the WEAI and its subindexes, 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 (or, equivalently, weighted indicators) 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 the group, for example, for special services. The situation of the most disempowered can be further analyzed to facilitate targeting. It is also possible to identify the women who are disempowered and are deprived in any one particular indicator, such as control over income, to provide specific interventions related to this indicator.

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

Finally, WEAI is a first rather than a final attempt. For the ongoing improvement of the index, it will be necessary to ascertain more precisely indicators' 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 WEAI to better shape policy and reflect improvements in women's empowerment in agriculture.

4. DATA

The individual-level questionnaire is the primary instrument for measuring empowerment and contains modules designed to elicit responses on 5DE. The pilot version included experiments using alternative phrasing of questions to allow validation and comparison of responses across different modes of question formation to better guide the choice of questions to be included in the final index questionnaire. The main objective of this exercise was to select 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 on decisionmaking. The individual questionnaire was administered to women and men in the same households so that a truly comparative gender indicator could be developed.

The sample sizes for the data collection were 350 households (625 individuals) in Guatemala and Uganda and 450 households (800 individuals) in Bangladesh. Because the survey aimed to produce empowerment measures for women, and for women in relation to men in their households, the pilot sampled only female-only and dual-adult households (that is, those with male and female adults). The sampling strategy oversampled single-female households (approximately 20% of total samples) to obtain sufficient sample sizes for analysis. 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 (Iganga) regions of the country. The results are therefore not representative of the countries as a whole; rather they reflect Feed the Future zones of influence or priority areas and should be interpreted accordingly. Within each preselected administrative area mentioned above sampling was based on probability proportional to population size (PPS) methodology.

The pilot surveys were all fielded from September to November 2011. Primary and secondary respondents are those who self-identify as the primary members responsible for decisionmaking, both social and economic, within the household. They are usually husband and wife; however, they can be other members as long as there is one male and one female aged 18 or older.

To select indicators for each domain and streamline the construction of WEAI as well as address concerns over the length and complexity of survey administration, a number of robustness and consistency checks were implemented. Specifically, issues regarding sample sizes and non-response, measurement error and data quality as well as correlation analysis were undertaken. Selected indicators are those that passed these tests. Further information about these issues can be found in Alkire, Ura, Wangdi, and Zangmo (2012).

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 to deepen our understanding of the five hypothesized domains of empowerment. The narrative guides for this exercise included the application of the individual pilot questionnaire, interspersed with semi-structured narratives. One objective was to explore respondent understandings, 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'?"

5. METHODOLOGY

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

(a) *5DE index*

This subindex assesses whether women are empowered across the five domains examined in WEAI. Although our final goal is a measure of empowerment, we construct 5DE in such a way that disempowerment can be analyzed, allowing us to identify the critical indicators that must be addressed to increase empowerment. We begin by computing a disempowerment index across the five domains (M_0); then we compute 5DE as $(1 - M_0)$.

(b) *Identification of the disempowered*

There are two equivalent notations that can be used to describe the construction of 5DE. The "positive" notation focuses on the percentage of empowered women and 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 & Foster, 2011a,b).

All adequacy indicators described in the previous section are first coded such that they assume the value 1 if the individual lacks adequate achievements in that indicator and a zero otherwise.

An inadequacy score c_i is computed for each person, according to his or her inadequacies across all indicators. The inadequacy score of each person is calculated by summing the weighted inadequacies experienced so that the inadequacy score for each person lies between 0 and 1. The score reaches its maximum of 1 when the person experiences inadequacy on all 10 indicators. A person who has no inadequacy on any indicator receives a c_i score equal to 0. Formally,

$$c_i = w_1 I_{1i} + w_2 I_{2i} + \cdots + w_d I_{di},$$

where $I_{di} = 1$ if the person i has an inadequate achievement in indicator d and $I_{di} = 0$ otherwise and w_d is the weight attached to indicator i with $\sum_{d=1}^{D} w_d = 1$.

A second cut-off or threshold is used to identify who is disempowered. The disempowerment cut-off is the share of (weighted) inadequacies a woman must have to be considered disempowered, and we will denote it by k. For those whose inadequacy score is less than or equal to the disempowerment cut-off, even if it is not 0, their score is replaced by 0, 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 & Foster, 2011a,b; Alkire, Foster, & 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 $c_i \leqslant k$, then $c_i(k) = 0$.[7]

(c) *Computing 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,b), M_0 combines two key pieces of information: (1) the proportion or incidence of individuals (within a given population) whose share of weighted inadequacies is more than k and (2) the intensity of their inadequacies—the average proportion of (weighted) inadequacies they experience.

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

$$H_p = \frac{q}{n}.$$

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

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

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

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

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

$$5\text{DE} = 1 - M_0.$$

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

$$5\text{DE} = H_e + H_p \times A_e,$$

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 $(1 - A_p)$.

A higher disempowerment cut-off (or lower empowerment cutoff) implies a lower number of disempowered individuals and, hence, a higher empowered headcount ratio and a higher 5DE.[8] Given the main purpose of WEAI, tracking change in women's empowerment, it was important to establish a cut-off that would result in baseline indexes that would allow a reasonable scope for improvement. After exploring the sensitivity of the empowerment classification for different cut-offs, we selected the disempowerment cut-off of 20%. An individual is disempowered if his or her inadequacy score is greater than 20%. This is the same as saying that an individual is identified as empowered in 5DE if he or she has adequate achievements in four of the five domains, enjoys adequacy in some combination of the weighted indicators that sum to 80% or more, or has an adequacy score of 80 or greater.

(d) *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 M_0 is that once the disempowered have been identified (in other words, once M_0 has been computed), one can decompose M_0 into its component-censored indicators to reveal how people are disempowered—the composition by indicator 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 the number of disempowered people who are deprived on that indicator divided 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 population's M_0. That is, if the M_0 is constructed from all 10 indicators, then

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

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

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

$$\text{Percentage Contribution of indicator } d \text{ to } M_0 = \frac{w_d CH_d}{M_{0_{population}}}.$$

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

(e) *Decomposing by population subgroups*

Another key feature of M_0 (and of 5DE) is that it can be decomposed by population subgroups such as regions or ethnic groups, depending on the sample design. For example, if there are two subgroups by which the survey is representative, eastern and western, 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, W denotes western, n_E/n is the population of eastern areas divided by the total population, and similarly the population of western areas divided by the total population is 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:

$$\text{Contribution of eastern areas to } M_{0_{country}} = \frac{\frac{n_E}{n} \times M_{0_E}}{M_{0_{country}}}.$$

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.

(f) *Gender Parity Index*

GPI is a relative inequality measure that reflects the inequality in 5DE profiles between the primary adult male and female in each household. The aggregate WEAI uses the mean GPI value of dual-adult households. Similar to 5DE, we compute GPI to celebrate gender parity in a positive sense; however, its construction immediately facilitates analysis of households that lack gender parity.

Male inadequacy scores are calculated in the same ways as female inadequacy scores. For the purpose of establishing gender parity, the score of men or women whose inadequacy score is less than or equal to the disempowerment cut-off of k is replaced by the value of k, which is 20%. To differentiate this from 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 $c_i \leqslant k$, then $c_i'(k) = k$. Such censoring has the effect of limiting the gap in the GPI so that changes in the adequacy of already-empowered men's scores do not affect the GPI, and all progress in reducing the gap would move women towards empowerment.

Each dual-adult household is classified as having or lacking gender parity. Households 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 greater than or equal to that of the male in her household.

GPI combines two key pieces of information: (1) the percentage of women who lack gender parity relative to their male household counterparts and (2) the extent of the inequality in empowerment between those women who lack parity and the men with whom they live.

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

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

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

The second component is called the average empowerment gap. It is the average percentage gap between the censored inadequacy scores of the women and men living in households that lack gender parity (I_{GPI}):

$$I_{GPI} = \frac{1}{h}\sum_{j=1}^{h} \frac{c_j'(k)^M - c_j'(k)^W}{1 - c_j'(k)^M},$$

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.

GPI is computed as follows:

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

As is evident, the GPI is equivalent to one minus a "poverty gap" or P1 measure of the Foster–Greer–Thorbecke family of poverty measures (1984), and GPI is likewise decomposable by subgroups. It is also parallel in structure to the 5DE, both being one minus a poverty-gap type of measure. The GPI score can be improved by increasing the percentage of women who enjoy 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}).

6. RESULTS

(a) *Southwestern Bangladesh pilot results*

WEAI for the sample areas in southwestern Bangladesh is 0.762. It is a weighted average of the 5DE subindex value of 0.746 and the GPI subindex value of 0.899. The results are presented in Table 2. The 5DE for Bangladesh shows that 39.0% of women are empowered. In the pilot areas, the 61.0% of women who are not empowered have, on average, inadequate achievements in 41.6% of domains (see Tables 2 and 3).

Based on the decomposition of the disempowerment measure (see Table 3), the domains in the Bangladesh sample areas that contribute most to women's disempowerment are weak leadership (30.6%) and lack of control over resources (21.6%). Approximately half of the women in the survey are not empowered and do not belong to any group. Forty-five percent of women are not empowered and lack access to credit and the ability to make decisions about it, and 28% have little decisionmaking 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

Table 2. *Results of 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 (M_0)	0.254	0.201
5DE Index ($1 - M_0$)	0.746	0.799
Number of observations	436	338
Percentage of data used	96.9%	96.6%
Percentage of women with no gender parity (H_{GPI})	40.2%	
Average Empowerment Gap (I_{GPI})	25.2%	
Gender Parity Index	0.899	
Number of women in dual households	350	
Percentage of data used	94.6%	
WEAI	0.762	

Source: Author's calculations.
Notes: WEAI = Women's Empowerment in Agriculture Index; 5DE = five domains of empowerment.

Table 3. *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%
Absolute contribution	0.026	0.005	0.006	0.019	0.030	0.050	0.049	0.028	0.015	0.026
% Contribution 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%
Absolute contribution	0.008	0.002	0.004	0.013	0.030	0.005	0.049	0.040	0.022	0.026
% Contribution by dimension	5.3%			23.5%		2.6%	44.3%		24.2%	

Source: Authors' calculations.
Note: 5DE = five domains of empowerment.

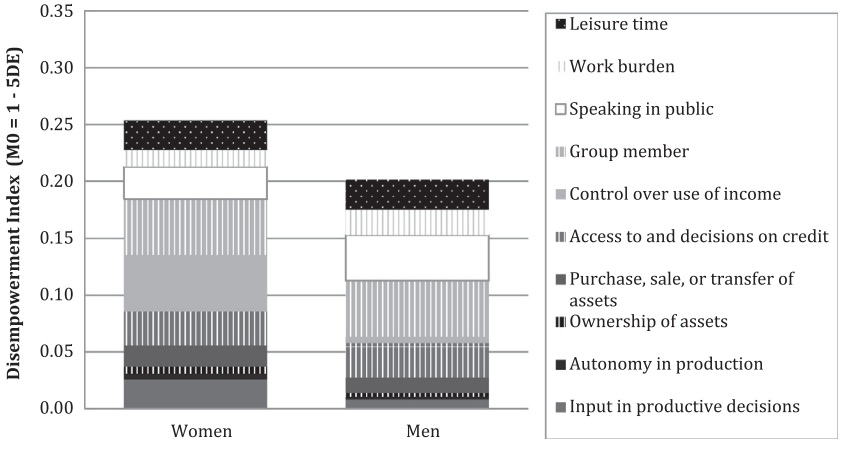

Figure 1. *Contribution of each indicator to disempowerment in Bangladesh sample.*

Bangladesh (see Figure 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. This may be because female seclusion limits the time that most women spend in agriculture outside the homestead; men then have to take care of most agricultural tasks, contributing to male time poverty. On the other hand, men report very little disempowerment in control over income and in decisionmaking around agricultural production compared to women.

GPI, meanwhile, shows that 59.8% of women have gender parity with the primary males in their households. Of the 40.2% of women who are less empowered, the empowerment gap between them and the males in their households is quite large at 25.2%.

Table 4. *Results of 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 (M_0)	0.310	0.129
5DE Index ($1 - M_0$)	0.690	0.871
Number of observations	237	197
Percentage of data used	67.7%	71.4%
Percentage of women with no gender parity (H_{GPI})	64.2%	
Average Empowerment Gap (I_{GPI})	29.1%	
Gender Parity Index	0.813	
Number of women in dual households	276	
Percentage of data used	67.8%	
WEAI	0.702	

Source: Authors' calculations.
Notes: WEAI = Women's Empowerment in Agriculture Index; 5DE = five domains of empowerment.

(b) *Western highlands of Guatemala pilot results*

WEAI for the sample areas in the Western Highlands of Guatemala is 0.702. It is a weighted average of the 5DE subindex value of 0.690 and the GPI subindex value of 0.813 (see Table 4). The 5DE for Guatemala shows that the empowered headcount ratio is 28.7% among women and 60.9% among men. The disempowered women have, on average, inadequate achievements in 43.5% of dimensions (See Table 4).

The decomposition of Guatemala's 5DE (see Table 5) shows that the domains that contribute most to Guatemalan women's disempowerment are lack of leadership in the community (23.7%) and control over the use of income (23.7%). More than 60% of women are not empowered and lack access to credit and the ability to make decisions about it, 45.1% are not group members, and 36.7% lack sole or joint decisionmaking 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 on all of the indicators (see Figure 2). The main difference is that lack of control over income contributes less to men's disem-

Table 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%
Absolute contribution	0.208	0.032	0.008	0.018	0.041	0.073	0.045	0.028	0.026	0.010
% Contribution by dimension	19.5%			21.7%		23.7%	23.7%		11.4%	
Men										
Censored headcount	0.046	0.203	0.036	0.142	.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%
Absolute contribution	0.005	0.020	0.002	0.009	0.023	0.023	0.024	0.007	0.005	0.009
% Contribution by dimension	19.3%		27.4%		18.2%		24.1%		11.1%	

Source: Authors' calculations.
Note: 5DE = five domains of empowerment.

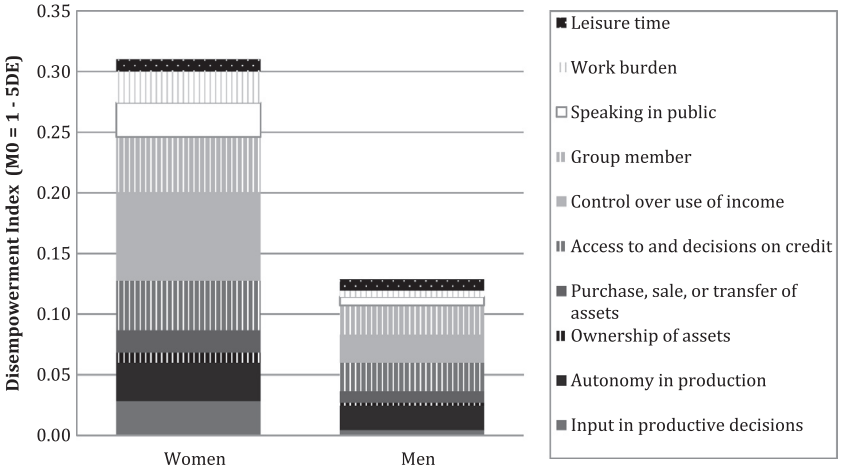

Figure 2. *Contribution of each indicator to disempowerment in Guatemala sample.*

Table 6. *Results of Uganda pilot WEAI*

Indexes	Uganda	
	Women	Men
Disempowered headcount (H)	56.7%	37.0%
Average inadequacy score (A)	37.2%	32.8%
Disempowerment Index (M_0)	0.211	0.122
5DE Index ($1 - M_0$)	0.789	0.878
Number of observations	335	262
Percentage of data used	95.7%	95.3%
Percentage of women with no gender parity (H_{GPI})	45.6%	
Average Empowerment Gap (I_{GPI})	22.4%	
Gender Parity Index	0.898	
Number of women in dual households	275	
Percentage of data used	90.9%	
WEAI	0.800	

Source: Authors' calculations.
Notes: WEAI = Women's Empowerment in Agriculture Index; 5DE = five domains of empowerment.

powerment than to women's, whereas the lack of control over resources contributes relatively more.

GPI for the Western Highlands of Guatemala shows that 35.8% of women have gender parity with the primary males in their households. The 64.2% of women who are less empowered have a quite large empowerment gap between them and the males in their households of 29.1%.

(c) *Uganda pilot results*

WEAI for the pilot districts in Uganda is 0.800, with 5DE value of 0.789 and GPI value of 0.898 (see Table 6). The 5DE for Uganda shows that 43.3% of women and 63.0% of men are empowered. The 56.7% of women who are not empowered have an average achieved empowerment in 62.8% of dimensions).

The domains that contribute most to women's disempowerment are time burden (26.3%) and lack of control over resources (23.1%). According to these pilot results, 48.7% of women are not empowered and lack access to or decisionmaking ability over credit, 30.7% do not have a manageable workload, and 31.9% are not members of any group (see Table 7 and Figure 3).

Table 7. *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	7
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%
Absolute contribution	0.006	0.013	0.007	0.009	0.032	0.041	0.032	0.015	0.031	0.025
% Contribution 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%
Absolute contribution	0.004	0.023	0.001	0.004	0.021	0.017	0.022	0.004	0.013	0.015
% Contribution by dimension	22.0%			20.5%		13.8%	21.0%		22.6%	

Source: Authors' calculations.
Note: 5DE = five domains of empowerment.

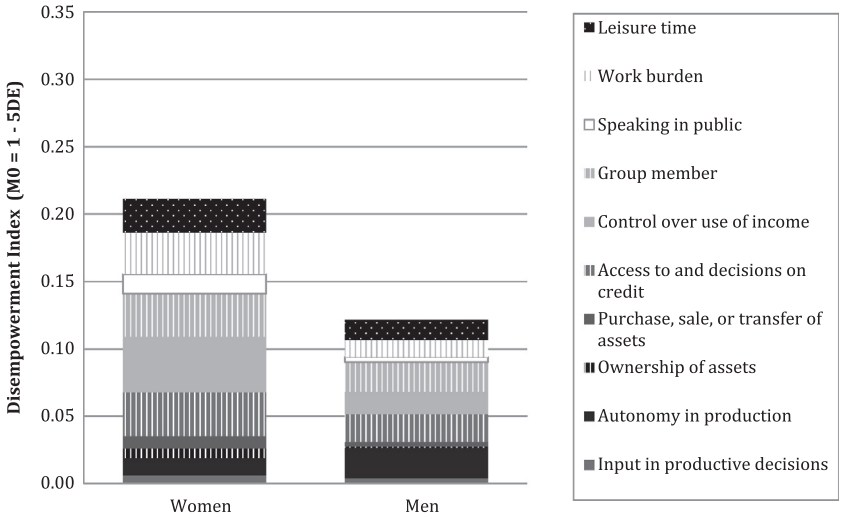

Figure 3. *Contribution of each indicator to disempowerment in Uganda sample.*

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

GPI for the selected districts of Uganda shows that 54.4% of women have gender parity with the primary males in their households. Of the 45.6% of women who are less empowered, the empowerment gap between them and the males in their households is 22.4%.

(d) *Insights from pilot findings*

Although the pilot studies had limited sample size and are not representative of the full USAID Feed the Future zones of influence, let alone the full countries, the pilot results illustrate the kinds of insights that the WEAI can provide. In Bangladesh, for example, a high proportion of men are not empowered, and the domains in which men and women lack empowerment differ considerably, whereas in the other countries, men are more likely than women to be empowered in every domain. Disaggregating the WEAI by components can identify key areas of disempowerment (for men as well as women), which can be used to prioritize interventions. Further disaggregation of the index can be used to identify regional variations to further tailor strategies to redress empowerment gaps.

7. CORRELATIONS WITH OTHER MEASURES

The 5DE deliberately focused only on empowerment in agriculture.[9] The precision of the measure creates a strength for analysis: We can easily scrutinize how empowerment in women's specific agricultural roles relates to other aspects of their resources and outcomes (Kabeer, 1999) as well as 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.
- Decisionmaking and autonomy on 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 DHS, the wealth index was constructed using principal components analysis, taking into account assets, dwelling characteristics, and other indicators.[10] A household level measure was used for comparability with the DHS and other nationally-representative data sets, which typically collect this information at the household level.

The household hunger score was computed following the methodology of the USAID Food and Nutrition Technical Assistance (FANTA-2) project (see Deitchler, Ballard, Swindale, & Coates, 2011).

We note that the decisionmaking and autonomy questions capture different aspects of empowerment. The decisionmaking questions reflect whether the respondent makes the decision or feels she could participate in making the decision if she wanted to. Autonomy questions reflect the extent to which the respondent's motivation in that field of action 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 and those who are non-empowered on WEAI than do the decisionmaking questions. For example, in Uganda, the average percentage difference between decisionmaking scores for women who are not empowered by WEAI is 9.2%, whereas for autonomy it is 12.7%; in Guatemala the distinction is more marked, with a 6.0% difference for the decisionmaking questions and a 29.7% difference for autonomy questions. In Bangladesh the pattern is less marked and more varied across domains.

Although the strength of association varies, in all three pilots across all six areas of decisionmaking and autonomy, women who were empowered by WEAI had higher empowerment in the six areas in all but one instance (decisionmaking regarding protection from violence in Bangladesh), and in that it was only very slightly higher among disempowered women (See Tables 11–13). As measures of association we present Cramer's V and the phi coefficient.[11] To assess the statistical significance of the association between empowerment and these characteristics we computed Pearson's chi-square 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.

The focus on agriculture is a strength of the WEAI, but also a potential weakness. While it is eminently suited to examining impacts of agricultural development programs on empowerment, or assessing the extent to which empowerment contributes to various outcomes related to food security, it is also possible that some of those outcomes may be influenced by other dimensions of decisionmaking that are not necessarily related to agriculture. Kabeer's (1999) review of studies on empowerment found, for example, that what mattered for achievements in relation to children's well-being was women's agency as *mothers* rather than as *wives* (italics in original). Ongoing analysis of outcomes related to child dietary diversity and nutritional status by some of the coauthors of this paper suggests that empowerment in agricultural domains are not necessarily the strongest predictors of these outcomes, possibly owing to similar mechanisms in which decisions regarding the allocation of food or health inputs within the household may be governed by different processes than are embodied in the five domains.

(a) *Age*

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 8 (Bangladesh), Table 9 (Guatemala), and Table 10 (Uganda).

In Bangladesh and Guatemala, age was significantly associated with women's empowerment. Table 8 shows that in Bangladesh, more than 40% of women aged 26–55 were empowered, compared to less than 33% 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 Guatemala only 9% of women younger than

Table 8. *Tabulations between empowerment and individual and household's characteristics in Bangladesh*

Characteristics	Women Empowered			Men Empowered		
	Yes	No	Missing	Yes	No	Missing
Age group						
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						
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						
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						
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	

Table 9. *Tabulations between empowerment and individual and household's characteristics in Guatemala*

Characteristics	Women Empowered			Men Empowered		
	Yes	No	Missing	Yes	No	Missing
Age group						
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						
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						
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						
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	

Table 10. *Tabulations between empowerment and individual and household's characteristics in Uganda*

Characteristics	Women Empowered			Men Empowered		
	Yes	No	Missing	Yes	No	Missing
Age group						
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						
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						
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						
Little to no hunger	123	129	12	136	71	13

(*continued on next page*)

	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	

Table 11. *Tabulations between empowerment and answers to decisionmaking and autonomy question in Bangladesh*

Decisionmaking and autonomy questions	Empowered		Phi coefficient	Pearson chi2		Fisher's exact	No. obs.	Missing information		
	Yes	No		Statistic	*p*-Value	*p*-Value		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 autonomy 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 autonomy 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

26% and 14% of those between 56 and 65 years of age were empowered, compared to more than 28% in other age cohorts. In contrast, among males the levels of empowerment were constant across age categories (see Tables 11–13).

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

(b) *Education*

In Bangladesh and Guatemala pilot regions, the relationship between education and empowerment in agriculture was insignificant for both men and women whereas in Uganda's it was significant. In Bangladesh, 39% of women with less than a primary school education were empowered, and the same percentage of women who had completed primary school were empowered. Among the seven women who had attained a secondary school and higher education, only two women were empowered. In Guatemala, 26% of women with less than a primary school education and 39% of women who had completed primary school were empowered in agriculture. Among men, these percentages were 59% and 65%, respectively.

The Ugandan pilot showed that 40% of women with less than a primary school education were empowered; this 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 to 69% of those who had completed primary school.

Table 12. *Tabulations between empowerment and answers to decisionmaking and autonomy question in Guatemala*

Decisionmaking and autonomy questions	Empowered		Phi coefficient	Pearson chi2		Fisher's exact	No. obs.	Missing information		
	Yes	No		Statistic	*p*-Value	*p*-Value		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 autonomy 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 autonomy 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

(c) *Wealth*

In Bangladesh and Uganda's pilots wealth was significantly associated with empowerment, but not in Guatemala's. In Bangladesh wealth was not sufficient to ensure empowerment: 21% of women in the poorest quintile were empowered, compared to 50% in the richest 20% of the population. Fifty percent of women in the top wealth quintile were not yet empowered, indicating that greater wealth increases empowerment but does not guarantee it. In Uganda's pilot 31% of women in the poorest quintile were empowered, compared to 68% in the richest. In the second and third quintiles, around 35% of women were empowered, rising to 45% in the fourth. Among Ugandan males the levels of empowerment were constant across wealth quintiles: 65% in households in the poorest quintile and 71 among the richest. In Guatemala's pilot regions 23% of women in the poorest quintile were empowered, compared to 33% in the richest. It is striking that on average, 69% of women in the top three wealth quintiles were not yet empowered (including 67% of the richest 20%), indicating that wealth is an imperfect proxy for women's empowerment in agriculture.

(d) *Household Hunger Score*

In Bangladesh's pilot regions the relationship between empowerment in agriculture and living in a household reporting a higher hunger score was not statistically significant for women or men, but in Uganda's and Guatemala's it was.

(e) *Empowerment in other domains*

In all three pilot regions, women's empowerment in agriculture was associated with significantly greater decision-making and autonomy regarding religious faith, greater decision-making regarding family planning, and higher autonomy in protection from violence. For example, in Bangladesh, 73% of women who were empowered in agriculture felt empowered in decisionmaking regarding family planning, compared to 61% of women who were not empowered in agriculture. In Guatemala and Uganda's pilot regions, women's empowerment in agriculture was associated with greater empowerment in most other domains, with Uganda having significance in almost all domains.

There was no statistical evidence of a relationship between men's empowerment in agriculture and decisionmaking and autonomy in any of the areas considered.

In Guatemala and Uganda, the variable "autonomy" showed greater differences between those who were empowered in agriculture and those who were not than the variable "decisionmaking." In Guatemala, the differences in decisionmaking were not statistically significant, but the differences in autonomy in all the areas of decision were significant at the 1% level. For example, the percentage of women who felt empowered with respect to minor household expenditures decisionmaking was 94% of women who were empowered in agriculture compared to 86% of women who were not empowered. Differences in autonomy results were higher: 79% among empowered women, *vs.* 51% of disempowered women. In Uganda, 87% of women who were empowered in agriculture

Table 13. *Tabulations between empowerment and answers to decisionmaking and autonomy question in Uganda*

Decisionmaking and autonomy questions	Empowered		Phi coefficient	Pearson chi2		Fisher's exact	No. obs.	Missing information		
	Yes	No		Statistic	*p*-Value	*p*-Value		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 autonomy 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 autonomy 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

felt they could make decisions related to serious health problems, compared to 75% among women who were not empowered in agriculture. For the autonomy question, the difference was 80% among women who were empowered in agriculture compared to 63% among disempowered women.

Despite these varying relationship patterns, there is no individual or household characteristic that is strongly associated (Cramer's V or phi coefficient greater than 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 pilots 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 areas, and further work needs to be undertaken in other countries to see whether these results can be generalized.

8. INTRAHOUSEHOLD PATTERNS OF EMPOWERMENT

The richness of the intrahousehold data enables many further comparisons of women and men. Recall that the 5DE

Table 14. *Empowerment patterns by household*

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

Source: Authors' computations.

values for Bangladesh, Uganda, and Guatemala pilot regions differ: In absolute terms, the lowest male 5DE of 0.77 (Bangladesh) is only marginally lower than the highest 5DE for women (0.78, in Uganda). But how are empowered men and women distributed across the households?

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

Table 14 shows the intrahousehold patterns of 5DE. We see that the two extreme experiences are in Bangladesh and Guatemala. In Guatemala's pilot region, nearly 37% of households have a disempowered woman and an empowered man, and only 7% have the reverse. In contrast, in Bangladesh 17% of households have a woman who is disempowered and a man who is empowered, whereas almost 21% have it the other way around, with a situation more favorable to the woman than to the man. Thus, it is very useful to consider the intrahousehold patterns by gender as these are likely to evolve over time.

9. CONCLUSION AND POLICY IMPLICATIONS

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 rigorous methodology underlying the WEAI, together with its indicators, offers a means to measure women's empowerment in a manner that is comparable across sites and relevant to agriculture. Based on intrahousehold 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 (that is, 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, however: there are limitations in several of the indicators used in the pilot survey, notably

- Women who are engaged in decisionmaking on non-agricultural activities may appear disempowered if they are not involved in agricultural decisions;
- Questions about control over resources and income do not capture many of the nuances behind these domains;
- The prevalence of decisionmaking questions mean that female-only households are likely to be identified as empowered (although there may be others, such as parents, in-laws, or children with whom such women also need to negotiate);
- Group membership alone is an inadequate indicator of active participation (but more detailed indicators left too many missing values);
- The satisfaction with leisure question is subjective and may reflect adaptive preferences—that is, women may be more satisfied with their leisure than are men because their expectations have adapted to what is possible in their circumstances; and
- The focus on agriculture may not capture other domains of empowerment that may be more relevant to specific desired outcomes.

As with other indexes, further refinement of WEAI is possible as additional and larger surveys are implemented and analyzed in different contexts. Perhaps the greatest contribution of WEAI may be to define and highlight the domains of empowerment and how multidimensional indices can be used to provide an overall analysis of women's empowerment so that agricultural development programs address all domains. *Ex ante* assessments of programs should, at a minimum, ensure that interventions do no harm, such as by increasing women's workloads or transferring decisionmaking 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 and gender parity. As illustrated in the pilot study results, the areas of disempowerment of women (and men) differ from country to country; WEAI measures can help to identify who are the key decisionmakers in different types of production and whether the greatest needs are for resources, credit, leadership, or time. Analyzing the specific indicators that make up the WEAI can also serve to identify which indicator matters most for particular development outcomes, so that these areas can be better targeted by programs and policy.

NOTES

1. See materials on the Feed the Future Initiative's website, http://feedthefuture.gov/resource/feed-future-overview.

2. This index purposely does not use the concepts of male-headed and female-headed households, which are fraught with difficulties and assumptions about "headship" (see Budlender, 2003; Buvinić & Gupta, 1997; Deere, Alvarado, & Twyman, 2012). Rather, we classify households in terms of whether there are both male and female adults (dual-adult households), only female adults, or only male adults. The latter are very rarely found in our study areas, and are excluded from our sample because of our focus on women's empowerment.

3. 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.

4. Individuals who live in households that do not own any type of asset are considered inadequate on ownership.

5. The Lesotho Time Budget Study is part of the Lesotho Budget Survey, which can be accessed at http://www.surveynetwork.org/home/index.php?q=activities/catalog/surveys/ihsn/426-2002-002. 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. In the WEAI pilot, respondents did not keep diaries, but survey interviewers used similar grids of preprinted activities and time intervals.

6. The 50% weight assigned to the secondary activity is an arbitrarily lower weight, assigned because the respondent designates the secondary activity as less important (Bardasi & Wodon, 2006).

7. In the WEAI, we define the disempowerment cutoff as strict ($c_i > k$); in previous work we have defined the cutoff as weak ($c_i \geqslant k$) (Alkire & Foster, 2011a,b).

8. Note that the empowerment cutoff is equal to 80% (100% − disempowerment cutoff). In this section we have explained identification with reference to a disempowerment cutoff.

9. Nearly 100% of the population in the pilot areas were agricultural households, or rural households with some agricultural activities. The results should be interpreted with this in mind; some of the results discussed subsequently (e.g., richest or most educated are not empowered) might be explained because they are not engaged in agriculture at all, but are in some other occupation.

10. The full list of indicators used to calculate the wealth index includes number of household members per sleeping room (or total room if the number of sleeping rooms is unavailable), rooftop 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, nonfarm 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.

11. 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 decisionmaking and autonomy, characteristics that were coded as dichotomous variables, we present the phi coefficient as a measure of association.

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