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**Development of the project-level Women's Empowerment
in Agriculture Index (pro-WEAI)**

Hazel Malapit
Agnes Quisumbing
Ruth Meinzen-Dick
Greg Seymour
Elena M. Martinez
Jessica Heckert
Deborah Rubin
Ana Vaz
Kathryn M. Yount

Gender, Agriculture, and Assets Project, Phase 2 (GAAP2) Study Team

Poverty, Health, and Nutrition Division
Environment and Production Technology Division

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

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AUTHORS

Hazel Malapit (h.malapit@cgiar.org) is a Senior Research Coordinator in the Poverty, Health, and Nutrition Division at the International Food Policy Research Institute, Washington, DC.

Agnes Quisumbing (a.quisumbing@cgiar.org) is a Senior Research Fellow in the Poverty, Health, and Nutrition Division at the International Food Policy Research Institute, Washington, DC.

Ruth Meinzen-Dick (r.meinzen-dick@cgiar.org) is a Senior Research Fellow in the Environment and Production Technology Division at the International Food Policy Research Institute, Washington, DC.

Greg Seymour (g.seymour@cgiar.org) is a Research Fellow in the Environment and Production Technology Division at the International Food Policy Research Institute, Washington, DC.

Elena M. Martinez (e.martinez@cgiar.org) is a Research Analyst in the CGIAR Research Program on Agriculture for Nutrition and Health (A4NH), led by the International Food Policy Research Institute, Washington, DC.

Jessica Heckert (j.heckert@cgiar.org) is a Research Fellow in the Poverty, Health, and Nutrition Division at the International Food Policy Research Institute, Washington, DC.

Deborah Rubin (drubin@culturalpractice.com) is Co-Director at Cultural Practice, LLC, Bethesda, MD.

Ana Vaz (ana.vaz@qeh.ox.ac.uk) is a Senior Research Officer at the Oxford Poverty and Human Development Initiative, Oxford UK.

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Development of the project-level Women's Empowerment in Agriculture Index (pro-WEAI)

Hazel Malapit¹ (h.malapit@cgiar.org), Agnes Quisumbing¹ (a.quisumbing@cgiar.org), Ruth Meinzen-Dick¹ (r.meinzen-dick@cgiar.org), Greg Seymour¹ (g.seymour@cgiar.org), Elena M. Martinez¹ (e.martinez@cgiar.org), Jessica Heckert¹ (j.heckert@cgiar.org), Deborah Rubin² (drubin@culturalpractice.com), Ana Vaz³ (ana.vaz@qeh.ox.ac.uk), Kathryn M. Yount⁴ (kathryn.yount@emory.edu), and the Gender, Agriculture, and Assets Project, Phase 2 (GAAP2) Study Team⁵

¹ International Food Policy Research Institute, Washington, DC

² Cultural Practice, LLC

³ Oxford Poverty and Human Development Initiative

⁴ Emory University

⁵See list of projects and authors on the next page

Corresponding author: Hazel Malapit (h.malapit@cgiar.org)

The Gender, Agriculture, and Assets Project, Phase 2 (GAAP2) Study Team

Principal investigators: Agnes Quisumbing, Ruth Meinzen-Dick, Hazel Malapit (co-Principal Investigators)

Index team: Jessica Heckert, Hazel Malapit, Elena Martinez, Emily Myers, Audrey Pereira, Greg Seymour, Ana Vaz

Health and nutrition index team: Anika Hannan, Jessica Heckert, Laurie James-Hawkins, Sunny Kim, Hazel Malapit, Elena Martinez, Greg Seymour, Audrey Pereira, Shalini Roy, Kathryn M. Yount

Qualitative team: Marlène Elias, Ruth Meinzen-Dick, Annet Mulema, Emily Myers, Deborah Rubin

Other key collaborators: Yuk Fai Cheong, Cheryl Doss, Lauren Maxwell, Kathryn M. Yount

Members are listed alphabetically by project, and alphabetically (by last name) within project:

Agriculture, Nutrition, and Gender Linkages (ANGeL): Akhter Ahmed, Anika Hannan, Shalini Roy, Masuma Younus

Bangladesh Agriculture Value Chains (AVC): Alan de Brauw, Amita Dey, Berber Kramer

Building resilience of vulnerable communities in Burkina Faso (Grameen): Benjamin Crookston, Megan Gash, Bobbi Gray

Deploying improved vegetable technologies to overcome malnutrition and poverty (WorldVeg): Pepijn Schreinemachers, Caroline Sobgui

Empowerment, Resilience, and Livestock Transfers (Heifer Project International): Sarah Janzen, Neena Joshi, Nicholas Magnan, Rajendra Pradhan, Sudhindra Sharma, Sophie Theis

Evaluation of women's food security program for impoverished Maasai households (Maisha Bora): Marc Bellemare, Bart Casier, Susan James, Brooke Krause, Mathias Lardinois, Aine McCarthy

Food and Agricultural Approaches to Reducing Malnutrition (FAARM): Sabine Gabrysch, Abdul Kader, Sheela Sinharoy, Jillian Waid, Amanda Wendt

Integrated poultry value chain and nutrition intervention (SE LEVER): Aulo Gelli, Melissa Hidrobo, Sita Zougouri

MoreMilk: Making the most of milk: Silvia Alonso, Alessandra Galié, Jessica Heckert, Tasokwa Kakota, Jef Leroy, Emily Myers, Giordano Palloni

Small-scale irrigation and women's empowerment in northern Ghana (iDE): Elizabeth Bryan, Brian Kiger, Dawit Mekonnen

Targeting and Realigning Agriculture to Improve Nutrition (TRAIN): Mamun Miah, Neha Kumar, Saiqa Siraj

UN Joint Programme on accelerating progress towards the economic empowerment of rural women in Ethiopia (JP-RWEE): Mihret Alemu, Brenda Boonabaana, Susan Kaaria, Vanya Slavchevska, Erdgin Mane

Women Improving Nutrition through Group-based Strategies (WINGS): Avijit Choudhury, Neha Kumar, Kalyani Raghunathan

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Abstract

With growing commitment to women's empowerment by agricultural development agencies, sound methods and indicators to measure women's empowerment are needed to learn which types of projects or project implementation strategies do and do not work to empower women. The Women's Empowerment in Agriculture Index (WEAI), which has been widely used, requires adaptation to meet the need for monitoring projects and assessing their impacts.

In this paper, the authors describe the adaptation and validation of a project-level WEAI (or pro-WEAI) that agricultural development projects can use to identify key areas of women's (and men's) disempowerment, design appropriate strategies to address identified deficiencies, and monitor project outcomes related to women's empowerment. The 12 pro-WEAI indicators are mapped to three domains: intrinsic agency (power within), instrumental agency (power to), and collective agency (power with). A gender parity index compares the empowerment scores of men and women in the same household. The authors describe the development of pro-WEAI, including: (1) pro-WEAI's distinctiveness from other versions of the WEAI; (2) the process of piloting pro-WEAI in 13 agricultural development projects during the Gender, Agriculture, and Assets Project, phase 2 (GAAP2); (3) analysis of quantitative data from the GAAP2 projects, including intrahousehold patterns of empowerment; and (4) a summary of the findings from the qualitative work exploring concepts of women's empowerment in the project sites. The paper concludes with a discussion of lessons learned from pro-WEAI and possibilities for further development of empowerment metrics.

Keywords: agency, agricultural development, multidimensional measurement, gender equality, women's empowerment

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Abbreviations and Acronyms

| | |
|----------|--|
| 3DE | Three Domains of Empowerment |
| A-WEAI | Abbreviated Women’s Empowerment in Agriculture Index |
| ANGeL | Agriculture, Nutrition, and Gender Linkages |
| AVC | Agriculture Value Chains |
| DAI | Development Alternatives Incorporated |
| DHH | Dual-adult household |
| FAARM | Food and Agricultural Approaches to Reducing Malnutrition |
| FHH | Female-adult-only household |
| FTF | Feed the Future |
| GAAP1 | Gender, Agriculture, and Assets Project |
| GAAP2 | Gender, Agriculture, and Assets Project, Phase 2 |
| GDI | Gender Development Index |
| GPI | Gender Parity Index |
| GII | Gender Inequality Index |
| Heifer | Heifer Project International |
| iDE | International Development Enterprises |
| IFPRI | International Food Policy Research Institute |
| ILRI | International Livestock Research Institute |
| IPV | Intimate partner violence |
| JP-RWEE | UN Joint Programme on accelerating progress towards the economic empowerment of rural women in Ethiopia |
| M&E | Monitoring and evaluation |
| MoreMilk | MoreMilk: Making the most of milk |
| NGSE | New General Self-Efficacy scale |
| pro-WEAI | Project-level Women’s Empowerment in Agriculture Index |
| RAI | Relative Autonomy Index |
| SDG | Sustainable Development Goal |
| SE LEVER | Soutenir l’Exploitation Familiale pour Lancer l’Élevage des Volailles et Valoriser l’Économie Rurale (Impact evaluation of an integrated poultry value chain and nutrition intervention) |

| | |
|----------|---|
| TRAIN | Targeting and Realigning Agriculture to Improve Nutrition |
| USAID | United States Agency for International Development |
| WEAI | Women’s Empowerment in Agriculture Index |
| WELI | Women’s Empowerment in Livestock Index |
| WENI | Women’s Empowerment in Nutrition Index |
| WINGS | Women Improving Nutrition through Group-based Strategies |
| WorldVeg | World Vegetable Center |

1. Introduction

Valid and comprehensive measures of gender equality and women's empowerment are essential to monitoring progress toward and achieving Sustainable Development Goal (SDG) 5. Women's empowerment and gender equality are important for their intrinsic value to women and girls and because of documented linkages with other SDGs, such as eliminating poverty (SDG 1), achieving zero hunger and malnutrition (SDG 2), and good health and well-being for women and children (SDG 3) (Cunningham et al. 2015; Malapit et al. 2015; Ruel, Quisumbing, and Balagamwala 2018; Sraboni et al. 2014).

Many agricultural development interventions specifically aim to empower women alongside goals to improve agricultural productivity and income; reduce poverty, hunger, and undernutrition; and improve health outcomes. Despite this growing commitment to gender equality and women's empowerment among funders and implementers of agricultural development projects and the proliferation of women's empowerment measures, consistent approaches for measuring women's empowerment in agricultural development projects are lacking. Appropriate metrics are needed to assess whether these projects are achieving their goals.

Many analyses of women's empowerment have drawn on a typology of power that is rooted in the seminal works of Freire (1968) on freedom and Lukes (1974) on power and articulated with respect to gender and women's empowerment by Rowlands (1995, 1997). This typology juxtaposes the notion of "power over" or dominating others, with generative forms of empowerment, including "power within" (involving self-respect, self-efficacy, and an awareness

of rights)¹, “power to” (enact personal goals), and “power with” (acting collectively toward shared interests) (see, also, Ibrahim and Alkire 2007). This framing is common not only in the academic literature, but also in guidance for development programming (e.g., Luttrell and Quiroz 2009) because of its practical implications.

Most indices of women’s empowerment have been measured and reported at the national level because they rely on administrative or aggregate data, and thus focus on gender equality, rather than women’s empowerment. Alkire et al. (2013) reviewed some of these indices, such as the Gender Gap Index (World Economic Forum [2018] and previous years), the Gender Development Index (GDI), and the Gender Inequality Index (GII) (UNDP 2018). These indices measure gender inequalities in a broad set of domains but do not measure women’s empowerment comprehensively or only rely on indirect proxies, such as women’s age, schooling attainment, and share of parliamentary seats. Moreover, because these indices rely on aggregate data, they cannot be decomposed by region or population subgroups. Several authors have recognized the limitations of using existing measures of gender equality to measure women’s empowerment (Alkire 2005; Alsop, Bertelsen, and Holland 2006; Kishor and Subaiya 2008; Narayan 2005, cited in Alkire et al. 2013; Yount et al. 2016).

Recent measures of empowerment, such as the Women’s Empowerment in Agriculture Index (WEAI) (Alkire et al. 2013), operationalize Kabeer’s (1999) definition of empowerment as the

¹ Rowlands only refers to “power to” and “power with” as generative, but we take the perspective that power within is also a form of generative power.

process by which people expand their ability to make strategic life choices, particularly in contexts in which this ability had been denied to them. 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 decision-making, negotiation, and even deception and manipulation), and achievements (well-being outcomes).

Filling a niche unaddressed by existing metrics, the WEAI measures women's empowerment in the agricultural sector directly through a focus on women's agency using individual-level data collected from male and female household members in a household survey designed for this purpose. The WEAI's focus on women's agency in the agricultural sector is important, given that agriculture remains the basis for the livelihoods of most rural people in low- and middle-income countries. Originally, the WEAI was intended as a monitoring and evaluation (M&E) tool for the US Government's Feed the Future (FTF) initiative to track changes in women's empowerment in agriculture over time and assess differences across countries, regions, and population subgroups. The WEAI was suited to this purpose, given its broad applicability and transparent design.

More than a single number, the WEAI provides an "information platform" (Alkire 2018) for measuring women's empowerment in agriculture. It includes multiple sub-indices and indicators that provide complementary, yet unique, pieces of information. As an aggregate, headline figure, the WEAI provides an overall measure of women's empowerment that is decomposable at multiple levels depending on the data's sample design. Alternatively, the

WEAI can be decomposed into its component sub-indices or by indicator. Further, because the WEAI uses data from both male and female respondents, it is possible to make direct comparisons between men and women in the same household and to diagnose separately the aggregate sources of disempowerment for men and women. Such gender comparisons are not possible using other available empowerment measures (e.g., based on Demographic and Health Surveys), which do not typically cover both men and women. The transparency of the WEAI stems directly from its counting-based measurement approach, which requires that the definitions, thresholds, and weights of each indicator are explicitly defined (Alkire et al. 2015).² However, although the WEAI focuses on the agency aspect of Kabeer's definition of empowerment, the original domains were chosen based on the areas that USAID identified as the most likely to be directly affected by Feed the Future programming.

Since its launch, at least 86 organizations in 52 countries (as of November 2018) have fielded the WEAI, often adapting it for their own use. Some adaptations were made to shorten interview time, but at the cost of removing key aspects of the index. Other modifications capture aspects of women's empowerment that were not included in the WEAI. However, many of the adaptations were ad hoc, and therefore no longer comparable to the original

² The counting-based approach distinguishes the WEAI from other index-based or scale-based approaches. It enables us to count both disempowered women and the numbers of indicators in which they are disempowered (or inadequate).

index. This practice has limited the ability of users to learn from each other and synthesize lessons across different settings.

Meanwhile, research on the measurement of women’s empowerment has flourished. A survey by O’Hara and Clement (2018) uses WEAI data and qualitative data from Nepal on local meanings of empowerment to suggest the importance of adding critical consciousness to the measures of agency. Several survey-based efforts are being undertaken using different methodologies from the WEAI to measure particular aspects of women’s livelihoods. While the WEAI broadly captures women’s empowerment in agriculture, the International Livestock Research Institute (ILRI) and Emory University, recognizing the importance of livestock to rural communities in East Africa, developed the Women’s Empowerment in Livestock Index (WELI) to explore how livestock is related to and supports women’s empowerment and the health and nutrition of women and children (Galié et al. 2018). The WELI focuses on key areas of livestock production, such as animal health, breeding, and feeding; as well as the use of livestock products, such as animal-source-food processing and marketing.³ Similarly, the Women’s Empowerment in Nutrition Index (WENI) aims to capture nutritional empowerment, or “the process by which individuals acquire the capacity to be well fed and healthy” (Narayanan et al. 2017). This process entails gaining access to, and control over, key resources, including *intakes of food* that are adequate and nutritious; *knowledge* about nutritional and health practices; and *support* from family and other institutions in securing and maintaining an adequate diet and

³ Although the WELI evolved separately from the pro-WEAI efforts, the teams from ILRI and IFPRI are now collaborating on a livestock module that can be one of the pro-WEAI add-on modules.

health. These resources, in turn, may enhance women’s agency, specifically their influence in decisions over the production, acquisition/procurement, and distribution of food. The authors rely on the heuristic WENI grid in which empowerment (resources, agency, and achievements) is measured in the domains of health, nutrition, and institutions, to identify areas of disempowerment that may influence poor nutritional outcomes. The authors focus on the nutritional empowerment of women, such that the nutritional outcomes of interest are those of women themselves, rather than of their children (Narayanan et al. 2017).

Outside the agricultural sector, other novel approaches for identifying measures of women’s empowerment have included the use of psychometric methods, such as factor analysis, item response theory methods, and structural equation modeling (Yount et al. 2014; Crandall, Rahim, and Yount 2015; Yount et al. 2016; Cheong, Yount, and Crandall 2017; Miedema et al. 2018). Such methods are especially useful for identifying survey questions that are valid measures of multifaceted constructs, like women’s agency. To be valid, such measures need to be conceptually sound and empirically (or psychometrically) “comparable” across groups and over time. Using these methods, Yount and colleagues have identified three indices of women’s ***intrinsic agency***. The first index—women’s perceived right to bodily integrity—uses attitudinal questions about intimate partner violence (IPV) against women that are psychometrically comparable across genders (Yount et al. 2014), age-at-marriage groups (Yount et al. 2016), and countries (Miedema et al. 2018). The second index—women’s perceived self-efficacy—validates the generalized self-efficacy scale in young Qatari women (Crandall, Rahim, and Yount 2015). The third index—women’s perceived social and economic rights—uses attitudinal questions

derived from qualitative research that are psychometrically comparable across Qatari and non-Qatari women (Yount, James-Hawkins, and Abdul-Rahim, nd).

Other analyses by Yount and colleagues have identified two indices for women's ***instrumental agency***. The first index—women's influence in household decisions—uses survey questions that capture a woman's influence in decisions about her own earnings, her husband's earnings, large or daily household purchases, seeking medical treatment, and visits to family and friends; psychometrically, these questions are valid at the national level in several countries (Yount et al. 2016, Miedema et al. 2018) and are comparable across age-at-marriage subgroups (Yount et al. 2016), countries (Miedema et al. 2018), and time (Cheong, Yount, and Crandall 2017). The second index—women's freedom of movement—uses survey questions that capture the ability of women to visit important venues outside the home; psychometrically, these questions are also valid at the national level (Yount et al. 2016), and are comparable across age-at-marriage subgroups (Yount et al. 2016) and over time (Cheong, Yount, and Crandall 2017). The pro-WEAI team is now leveraging similar methodologies to construct a validated, shorter version of pro-WEAI that measures the same concepts as the original for national- and program-level monitoring (Yount et al., 2019).

The original WEAI was developed for population-based monitoring of the Feed the Future initiative. Since then, both researchers and implementing organizations have undertaken broad and diverse adaptations of the WEAI, aiming to develop indices that focus on aspects of agricultural livelihoods not covered by the original WEAI. Demand clearly is high for a standardized and validated measure of women's empowerment that is useful for agricultural

development projects to assess the impact of their projects on women's empowerment, and to focus on outcomes that could change over the typical two- to five-year project cycle. This need is especially acute for projects that aim to empower women, not just reach or benefit them (Johnson et al. 2018). Outcome indicators must also detect potential unintended negative consequences that could result from women's participation in such projects, such as backlash from men as a result of projects that specifically target and/or empower women (World Bank/FAO/IFAD 2008) and increased constraints on women's time which may, in turn, negatively affect women's own health and nutrition as well as the health and nutrition of their children (Ruel, Quisumbing, and Balagamwala 2018).

To address this demand, pro-WEAI builds on the WEAI, but with more explicit links to empowerment theory and adapts it for use as a metric for measuring the impact of agriculture development projects on women's empowerment, as well as a diagnostic tool for tailoring such programs to specific settings. Following this introduction, the methodology section describes how pro-WEAI was developed collaboratively with 13 agricultural development projects in Africa and South Asia as part of the Gender, Agriculture, and Assets Project, Phase 2 (GAAP2), and how the quantitative and qualitative data were collected to develop and validate pro-WEAI. The next section provides an overview of the structure of pro-WEAI, including the definition of domains and indicators and the computation of the index, drawing from the qualitative research related to local understandings of empowerment. This section is followed by a presentation of the quantitative data on pro-WEAI from five participating projects for which complete data on all indicators are available, including robustness checks. The paper concludes

by discussing what we are learning from pro-WEAI and possibilities for further development of empowerment metrics.

2. Methodology

To develop an index that would be useful for projects, we worked with a portfolio of agricultural development projects that had explicit women’s empowerment goals to identify what they desired in a measurement tool and to learn what works best, in terms of both implementation and measurement, under different conditions (Table 1). The projects engaged in the design of the survey instrument by proposing indicators for inclusion and field-testing them, using qualitative and quantitative methods. Baseline data then were shared with the pro-WEAI team for analysis, validation, and creation of a draft pro-WEAI. Feedback on the draft index was elicited from the participant projects and stakeholders from research and development agencies.⁴

Table 1. Projects in the GAAP2 portfolio

| Project name | Partner organization(s) | Country | Commodity focus | Project outcome |
|--|---|----------------|------------------------|------------------------|
| Agriculture, Nutrition, and Gender Linkages (ANGeL) | Bangladesh Ministry of Agriculture and International Food Policy Research Institute (IFPRI) | Bangladesh | Crops | Nutrition |
| Bangladesh Agriculture Value Chains (AVC) | Development Alternatives Incorporated (DAI) and IFPRI | Bangladesh | Crops | Nutrition and income |
| Food and Agricultural Approaches to Reducing Malnutrition (FAARM) | Helen Keller International and University of Heidelberg | Bangladesh | Crops and livestock | Nutrition |
| Targeting and Realigning Agriculture to Improve Nutrition (TRAIN) | BRAC and IFPRI | Bangladesh | Crops | Nutrition |
| Building resilience of vulnerable communities in Burkina Faso (Grameen) | Grameen Foundation and Brigham Young University | Burkina Faso | Crops and livestock | Income and nutrition |

⁴ See Appendix A for details on the GAAP2 portfolio selection process.

| Project name | Partner organization(s) | Country | Commodity focus | Project outcome |
|--|---|----------------|------------------------|------------------------|
| Integrated poultry value chain and nutrition intervention (SE LEVER) | Agribusiness Systems International, AfricSante, and IFPRI | Burkina Faso | Livestock | Nutrition and income |
| UN Joint Programme on accelerating progress towards the economic empowerment of rural women in Ethiopia (JP-RWEE) | Food and Agriculture Organization of the United Nations, International Fund for Agricultural Development, United National Entity for Gender Equity and the Empowerment of Women, World Food Programme | Ethiopia | Crops and livestock | Income and nutrition |
| Small-scale irrigation and women's empowerment in northern Ghana (iDE) | International Development Enterprises (iDE) and IFPRI | Ghana | Crops | Nutrition and income |
| Women Improving Nutrition through Group-based Strategies (WINGS) | Professional Assistance for Development Action (PRADAN) and IFPRI | India | Crops and livestock | Nutrition |
| MoreMilk: Making the most of milk (MoreMilk) | International Livestock Research Institute, IFPRI, International Institute for Environment and Development, and Emory University | Kenya | Livestock | Nutrition and income |
| Deploying improved vegetable technologies to overcome malnutrition and poverty in Mali (WorldVeg) | World Vegetable Center | Mali | Crops | Nutrition and income |
| Empowerment, Resilience, and Livestock Transfers (Heifer) | Heifer Project International, Montana State University, University of Georgia, IFPRI, and Nepa School of Social Sciences and Humanities | Nepal | Livestock | Nutrition and income |
| Evaluation of women's food security program for impoverished Maasai households (Maisha Bora) | Savannahs Forever, Trias Tanzania, and University of Minnesota | Tanzania | Livestock | Nutrition and income |

2.1 Quantitative methods

Baseline data collection using the pilot pro-WEAI questionnaire occurred between April 2016 and June 2018. An important distinction between the WEAI and pro-WEAI is the choice of survey respondents. In the WEAI, the primary male and female adults in each household were interviewed; in pro-WEAI, the respondents were the intended beneficiary(ies) of the intervention, for example, the female beneficiary and her spouse or other primary male decision-maker in the household, or the equivalent in the control group. In households where no adult male was present, only the adult female was interviewed. Since many of the GAAP2 projects are targeted to women, we assume (for simplicity) that the eligible participant is a

woman.⁵ Owing to changes made to pro-WEAI following the inception workshop, five projects collected only a partial version of the pro-WEAI questionnaire. Three projects did not collect or collected modified versions of the questionnaire at baseline.⁶

2.2 Qualitative methods

Although pro-WEAI is computed based on survey data, qualitative research was an important part of the index's development to gain a better understanding of the conditions of poverty and women's disempowerment, to assess the salience of the pro-WEAI domains in local contexts, and to understand the linkages between project interventions and women's empowerment outcomes. As with the survey, the qualitative methods were developed through a participatory process with the project teams (for details on the methods, see Meinzen-Dick et al. 2019). The qualitative protocols included guidelines for the following: review of project documents; a community profile; a seasonality calendar; key informant interviews with project staff and with traders and marketers; focus group discussions on local meanings of empowerment; and semi-structured life history interviews with project participants and participants from control groups.

⁵ Differences in project designs and sampling strategies may result in systematically different distributions of age and other characteristics for women and men in the project samples. These differences should be taken into account when interpreting pro-WEAI results.

⁶ Ideally, we would have worked only with projects that had not yet started; however, both the realities of project implementation schedules and the requirement that all evaluations be completed by the end of the GAAP2 project meant that we included some projects that had completed baselines and initiated activities before we developed the questionnaires.

The qualitative teams then adapted these following the guidance of the projects on which topics to prioritize.

The qualitative findings described in this paper are based on data collected by eight of the 13 projects between November 2016 and February 2018, which were available for analysis when developing pro-WEAI. While ideally, to help develop the questionnaire, the qualitative studies would have preceded the surveys, this was only possible in one case (MoreMilk), because of the projects' schedules. Nonetheless, the team leading the qualitative research interacted with the index development team regularly and made explicit attempts to bring insights from the qualitative work in constructing the index. We drew on prior qualitative work on WEAI as well as the current studies in shaping the content of the surveys, formulating some of the indicators and determining the thresholds for adequacy and empowerment, and understanding the correlations between empowerment and other indicators. These processes are discussed in the presentation of the domains and indicators, and in more detail in a companion paper (Meinzen-Dick et al. 2019).

3. The project-level Women's Empowerment in Agriculture Index (pro-WEAI)

3.1 Domains and indicators of pro-WEAI

Both the WEAI and pro-WEAI are rooted in Kabeer's (1999, 2005) framework of empowerment, which describes empowerment as a process of change on the interrelated dimensions of resources, agency, and achievements and focuses specifically on measuring agency, or the ability of individuals to make strategic choices. Because well-developed methods already exist for collecting information on resources (e.g., Doss, Grown, and Deere 2008 and GAAP 2014) and

for achievements (outcomes) such as productivity, incomes, or nutrition, both WEAI and pro-WEAI focus on measuring agency, for which there are few, if any, standardized measures.⁷ However, whereas the original WEAI had five domains of empowerment with 10 indicators that are organized thematically and are informed by what USAID identified as feasible for FTF programs to affect directly, pro-WEAI has 12 indicators mapped to three domains: **intrinsic agency** (power within), **instrumental agency** (power to), and **collective agency** (power with) (Table 2). These three aspects of agency reflect the generative types of power described above (Rowlands 1997; Ibrahim and Alkire 2007). Though these three aspects of agency are present in the earlier WEAI, they were not explicit. These theoretical links are strengthened in the pro-WEAI.

Table 2. The domains, indicators, and weights in pro-WEAI

| Domain | Indicator | Weight |
|---------------------|---|-------------------------|
| Intrinsic agency | Autonomy in income | 1/12 for each indicator |
| | Self-efficacy | |
| | Attitudes about intimate partner violence against women | |
| | Respect among household members | |
| Instrumental agency | Input in productive decisions | 1/12 for each indicator |
| | Ownership of land and other assets | |
| | Access to and decisions on financial services | |
| | Control over use of income | |
| | Work balance | |
| Collective agency | Visiting important locations | 1/12 for each indicator |
| | Group membership | |
| | Membership in influential groups | |

⁷ A complete impact assessment also would collect information about key resources (including various aspects of human and social capital), and achievements.

Based on the consistent negative perceptions of coercive agency (power over) that were revealed in the qualitative research, that type of agency is not included in the index. This exclusion is consistent with the observation by Rowlands (1997:11):

When power is defined as 'power over', then if women gain power it will be at men's expense. It is easy to see why the notion of women becoming empowered is seen as inherently threatening, the assumption being that there will be some kind of reversal of relationships, and men will not only lose power but also face the possibility of having power wielded over them by women.

Table 3 presents full definitions for the pro-WEAI indicators and, if the indicator was previously included in the WEAI, how the pro-WEAI indicator differs. The four indicators of intrinsic agency include autonomy in income, self-efficacy, attitudes about IPV against women, and respect among household members. The six indicators of instrumental agency include input into productive decisions, ownership of land and other assets, control over use of income, access to and decisions on financial services, workload, and visiting important locations. Collective agency is comprised of group membership and membership in influential groups. Seven out of the 12 indicators in pro-WEAI build on the original WEAI indicators with modifications, and five indicators are new (attitudes about IPV against women, self-efficacy, respect among household members, visiting important locations, membership in influential groups) and stem from topics

that the projects themselves suggested. Each indicator is equally weighted, and a person is defined as empowered if she or he is empowered in at least 9 of 12 indicators, or 75 percent.⁸

Table 3. Pro-WEAI indicators, definitions of adequacy, and comparison to the original WEAI

| Indicator | Definition of adequacy | Difference compared to original WEAI |
|---|--|---|
| <i>Intrinsic Agency</i> | | |
| Autonomy in income | More motivated by own values than by coercion or fear of others' disapproval: <i>Relative Autonomy Index</i> ^a score >=1 RAI score is calculated by summing responses to the three vignettes (yes=1; no=0), using the following weighting scheme: -2 for vignette 2 (external motivation), -1 for vignette 3 (introjected motivation), and +3 for vignette 4 (autonomous motivation) | Based on "Autonomy in production" indicator in the WEAI but now focuses exclusively on the use of income generated from agricultural and non-agricultural activities and uses a new vignette-based survey instrument. |
| Self-efficacy | "Agree" or greater on average with self-efficacy questions: <i>New General Self-Efficacy Scale</i> ^b score >=32 | Not included in the WEAI |
| Attitudes about intimate partner violence against women | Believes husband is NOT justified in hitting or beating his wife in all 5 scenarios: ^c 1) She goes out without telling him 2) She neglects the children 3) She argues with him 4) She refuses to have sex with him 5) She burns the food | Not included in the WEAI |
| Respect among household members | Meets <u>ALL of the following</u> conditions related to another household member: 1) Respondent respects relation (MOST of the time) AND 2) Relation respects respondent (MOST of the time) AND 3) Respondent trusts relation (MOST of the time) AND 4) Respondent is comfortable disagreeing with relation (MOST of the time) | Not included in the WEAI |
| <i>Instrumental Agency</i> | | |
| Input in productive decisions | Meets <u>at least ONE of the following</u> conditions for <u>ALL of the agricultural activities</u> they participate in 1) Makes related decision solely, 2) Makes the decision jointly and has at least some input into the decisions 3) Feels could make decision if wanted to (to at least a MEDIUM extent) | Included in the WEAI, but now uses a stricter adequacy cut-off |
| Ownership of land and other assets | Owns, either solely or jointly, <u>at least ONE of the following</u> : | Included in the WEAI, but now uses a stricter adequacy cut-off |

⁸ We opted for equal weighting because there was no a priori rationale for why some indicators would be more important than others. Although weights could be based on local priorities, investigating what those priorities are would be a separate research undertaking; weights that differ depending on location would also not permit comparability across a project portfolio. In the absence of a theoretical rationale for weighting some higher than others, and in the interest of simplicity and transparency, we give all indicators equal weights but perform sensitivity tests on various weighting schemes. Weights also may be derived in the future from our on-going measurement work (Yount et al. 2019).

| | | |
|---|--|--|
| | <ol style="list-style-type: none"> 1) At least THREE small assets (poultry, nonmechanized equipment, or small consumer durables) 2) At least TWO large assets 3) Land | |
| Access to and decisions on financial services | <p>Meets at least ONE of the following conditions:</p> <ol style="list-style-type: none"> 1) Belongs to a household that used a source of credit in the past year AND participated in at least ONE sole or joint decision about it 2) Belongs to a household that did not use credit in the past year but could have if wanted to from at least ONE source 3) Has access, solely or jointly, to a financial account | Based on "Access to and decisions on credit" indicator in the WEAI, but now includes access to financial accounts |
| Control over use of income | Has input in decisions related to how to use BOTH income and output from ALL of the <u>agricultural activities</u> they participate in AND has input in decisions related to income from ALL non-agricultural activities they participate in, unless no decision was made | Included in the WEAI, but now uses a stricter adequacy cut-off |
| Work balance | Works less than 10.5 hours per day: Workload = time spent in primary activity + (1/2) time spent in childcare as a secondary activity | Similar to "Workload" indicator in the WEAI but restricts the measurement of secondary activities to a single activity: childcare. |
| Visiting important locations | <p>Meets at least ONE of the following conditions:</p> <ol style="list-style-type: none"> 1) Visits at least TWO locations at least ONCE PER WEEK of [city, market, family/relative], or 2) Visits least ONE location at least ONCE PER MONTH of [health facility, public meeting] | Not included in the WEAI |
| <i>Collective Agency</i> | | |
| Group membership | Active member of at least ONE group | Same as in the WEAI |
| Membership in influential groups | Active member of at least ONE group that can influence the community to at least a MEDIUM extent | Not included in the WEAI |

Notes: ^A The New General Self-efficacy Scale (NGSE) is a validated scale to measure self-efficacy, or a person's capabilities and ability to reach their goals (Chen et al. 2001).

^B The Relative Autonomy Index (RAI), based on self-determination theory, is a measure of internal and external motivations that determine person's decisions (Ryan and Deci 2000).

^C These scenarios are based on previously validated items from the Demographic and Health Surveys (Yount et al. 2014).

These indicators are mapped to existing theoretical domains and qualitative research in local contexts. The focus groups and individual interviews often described an empowered person in terms of having resources or achievements, rather than agency, because the former are easier to conceptualize and to observe. Resources could be tangible, such as livestock among pastoralist societies (the Maasai in Tanzania or Fulani in Mali), or less tangible, such as education (in Ethiopia, Mali, Nepal, and Bangladesh [AVC]) or connections to the outside (in Ghana and Nepal). Expressions of empowerment in terms of achievements often focused on having sufficient financial resources, manifested in good personal appearance and providing good food, clothing, housing and education for family members (Meinzen-Dick et al. 2019).

There were also expressions of empowerment as agency, phrased in terms of taking care of oneself, or being strong or able (e.g., Maisha Bora case of Maasai in Tanzania and JP-RWEE case in Ethiopia). The MoreMilk study in Kenya exemplified this: empowered milk traders were described as business-minded, making smart decisions, being good with customers, and maintaining hygienic standards for handling milk—a mix of intrinsic and instrumental agency. In almost all cases, women’s empowerment was associated with helping other people, reflecting a pursuit of common goals or collective agency. Such notions of collective agency tend to be grounded in the family but may extend to others in the community. These expressions of collective agency go beyond “power with” and might be better described as “power for others.”

Among other indicators of intrinsic agency, self-efficacy was not often articulated in qualitative research, but there was considerable discussion of IPV against women. A focus group participant in the Maisha Bora study in Tanzania indicated how violence can affect self-efficacy:

I’m worried to make any other decisions because I might be beaten by my husband and he tells me that I’m nothing and can’t do anything that can bring fruits to this family (Krause et al. 2018:31).

Women frequently described intrahousehold harmony as important to them, both for its intrinsic value and because harmonious relations with husbands and in-laws would enable women to do more, including having more mobility, attending group meetings, and earning income.

Decision-making was cited as an aspect of empowerment in the Ghana, Kenya, and Burkina Faso qualitative studies, but it was not always independent decision-making that was sought. In

the Bangladesh AVC study, women as well as men said that it was not good for women to make decisions independently. In Ethiopia, Mali, and Ghana, participants talked about the importance of women at least consulting their husbands as a sign of respect, or to maintain intrahousehold harmony. In the Ghana case, women privately expressed a desire for more input into decisions, but not having sole decision-making, in case something went wrong. Consistent with these aspirations for decision-making, pro-WEAI considers either sole or joint decision-making as empowering.

In pro-WEAI, we consider ownership of land and other assets to be an indicator of instrumental agency, rather than a measure of resources in Kabeer's framework because this indicator measures self-reported ownership, rather than externally-recognized rights to resources. For example, in the Maisha Bora study among Maasai in Tanzania, 96 percent of men and 65 percent of women report owning land either solely or jointly, although they rarely have any documentation of these land rights (Krause et al. 2018). Qualitative research on the pro-WEAI has repeatedly shown that agency is involved in realizing rights over resources (Meinzen-Dick et al. 2019). For example, qualitative research on control over assets in the study areas in Nepal illustrates the various types of agency women employ. Speaking of personal property (e.g., goats, small assets) classified as "pewa," women often spoke of "doing pewa" in an active sense, rather than more passively "having pewa" (Pradhan, Meinzen-Dick and Theis 2018). Hence, we argue that the act of claiming ownership over an asset is itself a reflection of agency. Prior quantitative analysis of the WEAI also supports this argument by revealing a high-degree of correlation between self-reported ownership of an asset and a bundle of property rights

associated with control over the asset, which were included in previous WEAI surveys (Malapit et al. 2017).

Access to financial services was discussed as empowering in the context of savings and loan groups, and formal bank accounts for milk traders in the MoreMilk case. Work balance was not explicitly mentioned as an aspect of empowerment, but excessive workloads were discussed as limiting women's ability to do many other things, including attending group meetings or earning income. The discussions of freedom of movement showed the extent of restrictions on women's ability to leave the homestead owing to gender norms and lack of time, as well as the importance of mobility to enable women to attend group meetings and earn income.

The discussions of group membership gave clear examples of how participation in groups could be empowering through new access to information, resources, a chance for women to connect with others. Thus, group membership and membership in important groups are suitable indicators of collective agency, although they may not go far enough to capture local definitions of empowerment as the ability to help others.

3.2 Computation of the index

Pro-WEAI, similar to the original WEAI, is calculated as the weighted mean of two sub-indices: the Three Domains of Empowerment Index (3DE), with a weight of 90 percent, and the Gender Parity Index (GPI), with a weight of 10 percent. The 3DE measures women’s achievements across three domains – **intrinsic agency** (power within), **instrumental agency** (power to), and **collective agency** (power with) – and includes women from both dual-adult and female-adult-only households. The GPI compares the empowerment scores of the eligible individual and her spouse in each dual-adult household. The choice of weights for the two sub-indices follows the original WEAI, placing greater emphasis on the 3DE while still recognizing the importance of gender equality as an aspect of empowerment. Improvements in either the 3DE or GPI will increase pro-WEAI scores. Details on how the individual indicators are combined to form the pro-WEAI index are presented in Appendix B.

4. Results

4.1 Quantitative data and pro-WEAI results

Table 4 presents basic demographic information for the combined sample (N=22,202) of five projects: ANGeL (N=7,500), AVC (N=960), SE LEVER (N=2,705), TRAIN (N=9,735), and WorldVeg (N=1,302). Most respondents were between the ages of 16 and 45, and female respondents were younger than male respondents, on average. Most respondents had either never attended school or had attended only primary school. Nearly all respondents were married at the time of the survey.

Table 4. Demographic characteristics of respondents

| Variable | Percent of respondents | |
|--------------------------------|------------------------|------|
| | Female | Male |
| <i>Age group</i> | | |
| 16-25 | 32.1 | 6.3 |
| 26-45 | 57.5 | 62.2 |
| 46-65 | 9.9 | 28.1 |
| >65 | 0.2 | 3.3 |
| Missing | 0.3 | 0.2 |
| <i>Education</i> | | |
| Never attended school | 44.9 | 46.1 |
| Less than primary | 13.9 | 19.3 |
| Primary | 33.4 | 24.5 |
| Secondary | 7.0 | 7.7 |
| Undergraduate or higher | 0.0 | 0.1 |
| Missing | 0.9 | 2.3 |
| <i>Marital status</i> | | |
| Married | 98.8 | 97.7 |
| Unmarried (never married) | 0.2 | 1.6 |
| Unmarried (previously married) | 0.8 | 0.5 |
| Missing | 0.2 | 0.2 |

Source: Baseline data from ANGeL (N=7,500), AVC (N=960), SE LEVER (N=2,705), TRAIN (N=9,735), and WorldVeg (N=1,302).

Note: Weighted by inverse project sample size. See Appendix C for unweighted sample size, age, and education by project and gender.

The aggregate pro-WEAI score for women in the pilot baseline sample, weighted by inverse project sample size, is 0.59. This figure is the weighted average of the 3DE score for women, 0.57, and the GPI score, 0.77 (Table 5). Sixteen percent of women and 43 percent of men are empowered. Of those women who are disempowered, the mean adequacy score is 0.49; these women achieve adequacy in an average of 49 percent of the indicators. Of men who are identified as disempowered, the mean adequacy score was 0.59, indicating that these men achieve adequacy in an average of 59 percent of the indicators. The GPI score is 0.77, and 30 percent of households achieved gender parity. The average empowerment gap between women who do not achieve gender parity and the men in their households is 33 percent.

Table 5. Pro-WEAI results

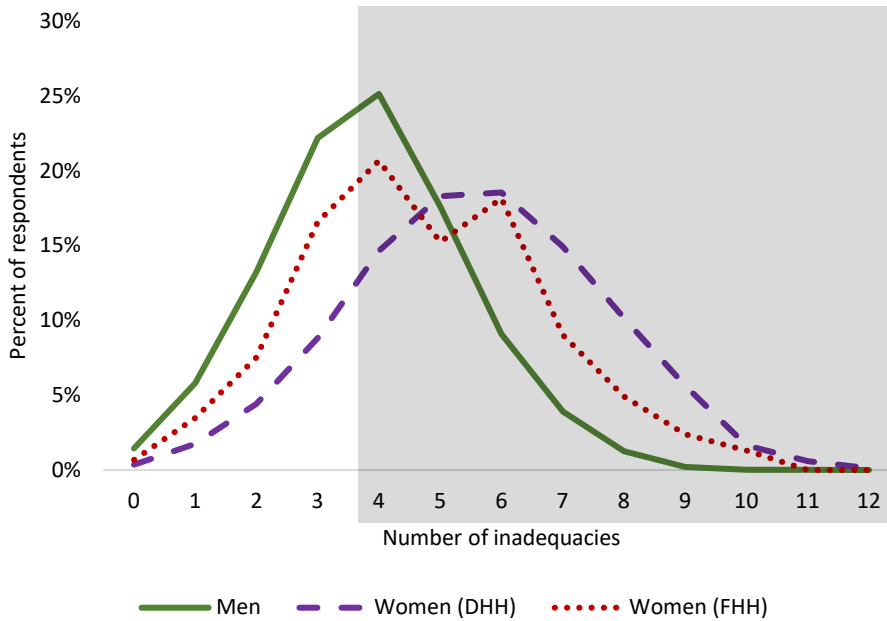
| Indicator | Women | Men |
|--|-------------|-------------|
| Number of observations | 11,513 | 10,689 |
| 3DE score | 0.57 | 0.76 |
| Disempowerment score (1 — 3DE) | 0.43 | 0.24 |
| % achieving empowerment | 16% | 43% |
| % not achieving empowerment | 84% | 57% |
| Mean adequacy score for not yet empowered | 0.49 | 0.59 |
| Mean disempowerment score (1 — adequacy) for not yet empowered | 0.51 | 0.41 |
| Number of dual-adult households | 10,689 | |
| Gender Parity Index (GPI) | 0.77 | |
| % achieving gender parity | 30% | |
| % not achieving gender parity | 70% | |
| Average empowerment gap | 0.33 | |
| Pro-WEAI score | 0.59 | |

Source: Baseline data from ANGeL (N=7,500), AVC (N=960), SE LEVER (N=2,705), TRAIN (N=9,735), and WorldVeg (N=1,302).

Note: Weighted by inverse project sample size. Respondents with missing indicators are dropped from the sample. See Appendix D for the percent of the pro-WEAI sample dropped from index calculations.

The 3DE score represents the achievements of women in the sample across the 12 indicators of empowerment in pro-WEAI. It considers the number of women who are disempowered and the intensity of their disempowerment, or the number of indicators on which these disempowered women are inadequate. Figure 1 compares the number of inadequacies among men and women. Overall, men have fewer inadequacies than women. The individuals in the shaded box in Figure 1, who are inadequate in four or more indicators, are disempowered. More women than men are disempowered, and disempowered women have more inadequacies, on average, than disempowered men. In other words, women experience a higher intensity of disempowerment than men.

Figure 1. Distribution of inadequacies



Source: Baseline data from ANGeL (N=7,500), AVC (N=960), SE LEVER (N=2,705), TRAIN (N=9,735), and WorldVeg (N=1,302).
Notes: Shaded box indicates disempowered respondents, i.e., those who are inadequate in four or more indicators. Weighted by inverse project sample size. DHH means dual-adult household (households in which an adult male and adult female are present); FHH means female-adult-only household (households in which no adult male is present).

When analyzing the pro-WEAI results, it is useful to compare the uncensored and censored headcount ratio (Table 6). The censored headcount ratio is the proportion of respondents who are disempowered *and* inadequate in a given indicator. The uncensored headcount ratio, on the other hand, is the proportion of respondents who are inadequate in a given indicator, regardless of their empowerment status.⁹ In all 12 indicators, more women than men are inadequate. The gap in adequacy between women and men is largest for work balance and ability to visit important locations. Most women (84%) are disempowered, so the uncensored and censored headcount ratios for women are similar. For men, the uncensored and censored

⁹ See Appendix B for details on the calculation of censored and uncensored headcount ratios.

headcount ratios are similar only for input in productive decisions and ownership of land and other assets, which suggests that most men who are inadequate in these indicators are disempowered. There is a large difference between the uncensored and censored headcount ratios for men for group membership and membership in influential groups, meaning that a large proportion of men are inadequate in these indicators but not disempowered.

Table 6. Headcount ratios and relative contributions of each indicator to disempowerment

| Indicator | Uncensored headcount ratio (%) | | Censored headcount ratio (%) | | Proportional contribution to disempowerment (%) | |
|---|--------------------------------|-------|------------------------------|-------|---|-------|
| | Men | Women | Men | Women | Men | Women |
| <i>Intrinsic agency</i> | | | | | | |
| Autonomy in income | 38.6 | 41.7 | 26.5 | 39.3 | 9.3 | 7.5 |
| Self-efficacy | 36.8 | 49.3 | 28.6 | 46.5 | 9.9 | 8.9 |
| Attitudes about intimate partner violence against women | 34.6 | 49.1 | 25.5 | 45.6 | 8.9 | 8.8 |
| Respect among household members | 25.0 | 38.4 | 17.9 | 36.0 | 6.2 | 6.9 |
| <i>Instrumental agency</i> | | | | | | |
| Input in productive decisions | 7.4 | 18.4 | 6.8 | 18.2 | 2.4 | 3.5 |
| Ownership of land and other assets | 1.1 | 21.6 | 1.0 | 20.3 | 0.3 | 3.9 |
| Access to and decisions on financial services | 24.4 | 40.4 | 18.6 | 39.1 | 6.5 | 7.5 |
| Control over use of income | 13.4 | 33.2 | 11.1 | 32.4 | 3.9 | 6.2 |
| Work balance | 33.5 | 61.5 | 24.2 | 55.5 | 8.4 | 10.7 |
| Ability to visit important locations | 31.8 | 59.5 | 25.4 | 53.4 | 8.9 | 10.2 |
| <i>Collective agency</i> | | | | | | |
| Group membership | 63.7 | 64.8 | 48.9 | 61.6 | 17.0 | 11.8 |
| Membership in influential groups | 71.5 | 79.1 | 52.6 | 73.2 | 18.2 | 14.0 |

Source: Baseline data from ANGeL (N=7,500), AVC (N=960), SE LEVER (N=2,705), TRAIN (N=9,735), and WorldVeg (N=1,302).

Notes: The censored headcount ratio reflects the percent of respondents who are both disempowered and inadequate in the indicator. Uncensored headcount ratio reflects the percent of respondents who are inadequate in the indicator. Weighted by inverse project sample size.

Figure 2 depicts the absolute contribution of each indicator to disempowerment for men and women in the sample. The overall depth of each bar shows the total disempowerment score (1-3DE), and the different colored bars within show the absolute contribution of each indicator to disempowerment.¹⁰ Overall, women are more disempowered than men. The largest contributors to disempowerment for women and men are group membership and membership in influential groups. Visiting important locations, work balance, self-efficacy, attitudes about IPV against women, and autonomy in income also are large contributors to disempowerment for women. The similarities and differences between women's and men's disempowerment profiles point to opportunities for interventions to close empowerment gaps by addressing them in program design.

¹⁰ See Appendix B for details on how to calculate the contribution of each to disempowerment.

Figure 2. Contributions of each indicator to disempowerment



Source: Baseline data from ANGeL (N=7,500), AVC (N=960), SE LEVER (N=2,705), TRAIN (N=9,735), and WorldVeg (N=1,302).
 Note: Weighted by inverse project sample size.

4.1.1 Intra-household patterns of empowerment

We use data from individuals living in dual-adult households to examine intra-household patterns of empowerment (Table 7). In most dual-adult households (72%), the man is adequate in more indicators than the woman; the woman is adequate in more indicators than the man in 16 percent of households; and the man and the woman are equally adequate in 12 percent of households. On average, the male respondent is adequate in 15 percent more indicators (approximately two indicators) than the female respondent in the same household.

In the overall sample, most men (57%) and women (84%) are disempowered. In about half of dual-adult households, neither the man nor the woman achieved empowerment. In about a third of households, only the man is empowered.

Table 7. Intrahousehold patterns of empowerment

| | % of dual-adult households |
|---|-----------------------------------|
| Male adequacy score > female adequacy score | 72.0 |
| Female adequacy score > male adequacy score | 16.2 |
| Female adequacy score = male adequacy score | 11.8 |
| Only male is empowered | 35.3 |
| Only female is empowered | 8.1 |
| Both male and female are empowered | 7.4 |
| Neither male nor female are empowered | 49.2 |

Source: Baseline data from ANGeL (N=7,500), AVC (N=960), SE LEVER (N=2,705), TRAIN (N=9,735), and WorldVeg (N=1,302).

Note: Weighted by inverse project sample size.

4.1.2 Decomposition of the 3DE score by age group

The 3DE is decomposable at any level for which the dataset is representative. For example, in the pro-WEAI results above, the 3DE is decomposed by gender. The analogous 5DE score from the original WEAI often is decomposed by sub-regions or other groups within a country. For an impact evaluation, projects may find it useful to decompose the 3DE by other categories, such as demographic or treatment groups. Here, we present an example of decomposition by the woman’s age group.

First, projects can compare the aggregate pro-WEAI scores between groups (Table 8). In this example, the pro-WEAI, 3DE, and GPI scores are all highest among women aged 26 to 45 years compared to younger and older women, meaning that women in this middle age group are more empowered and have greater parity with the men in their households.

Table 8. Pro-WEAI results by age group

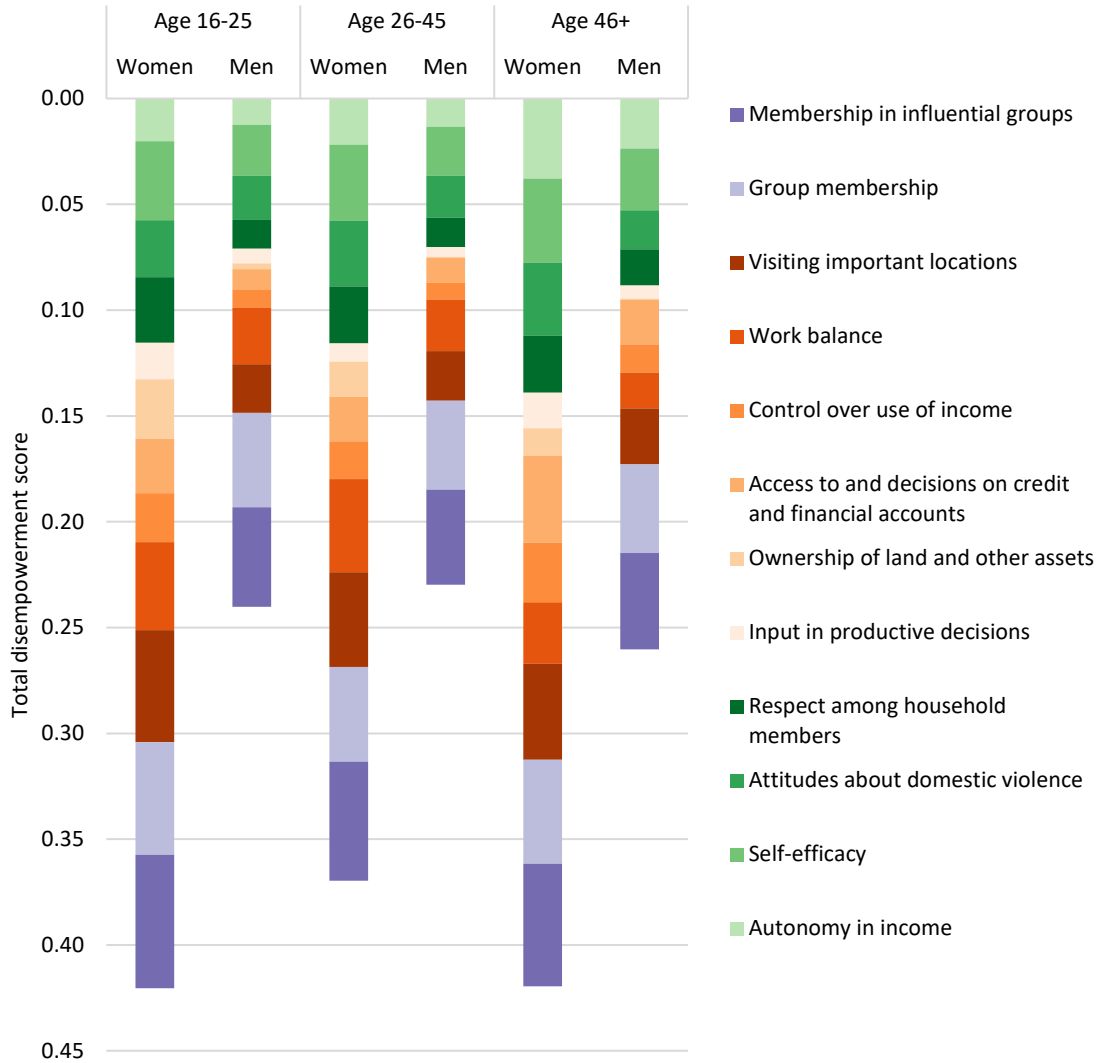
| Indicator | Age 16-25 | | Age 26-45 | | Age 46+ | |
|--------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Women | Men | Women | Men | Women | Men |
| Number of observations | 5148 | 4786 | 5862 | 5290 | 444 | 399 |
| 3DE score | 0.58 | 0.76 | 0.63 | 0.77 | 0.58 | 0.74 |
| Disempowerment score (1 – 3DE) | 0.42 | 0.24 | 0.37 | 0.23 | 0.42 | 0.26 |
| % achieving empowerment | 0.18 | 0.40 | 0.23 | 0.44 | 0.17 | 0.40 |
| % not achieving empowerment | 0.82 | 0.60 | 0.77 | 0.56 | 0.83 | 0.60 |
| Mean 3DE score for not yet empowered | 0.49 | 0.59 | 0.52 | 0.60 | 0.49 | 0.58 |
| Mean disempowerment score (1 – 3DE) | 0.51 | 0.41 | 0.48 | 0.40 | 0.51 | 0.42 |
| Number of dual-adult households | 4786 | | 5290 | | 399 | |
| Gender Parity Index (GPI) | 0.77 | | 0.82 | | 0.79 | |
| % achieving gender parity | 0.32 | | 0.39 | | 0.36 | |
| % not achieving gender parity | 0.68 | | 0.61 | | 0.64 | |
| Average empowerment gap | 0.34 | | 0.29 | | 0.33 | |
| Pro-WEAI score | 0.59 | | 0.65 | | 0.60 | |

Source: Baseline data from ANGeL (N=7,500), AVC (N=960), SE LEVER (N=2,705), TRAIN (N=9,735), and WorldVeg (N=1,302).

Note: Weighted by inverse project sample size.

Projects can also compare the contributions to disempowerment of each indicator between groups. In this example, the largest contributors to disempowerment for all three age groups are group membership and membership in influential groups. Ownership of land and other assets is a much larger contributor to disempowerment for women than men in all three age groups. Some contributors varied between age groups. Work balance was a larger contributor to disempowerment for women aged 16 to 25 and 26 to 45 compared to older women; control over use of income and autonomy in income were larger contributors to disempowerment for women aged 46 and older compared to younger women (Figure 3).

Figure 3. Contributors to disempowerment by age group



Source: Baseline data ANGeL (N=7,500), AVC (N=960), SE LEVER (N=2,705), TRAIN (N=9,735), and WorldVeg (N=1,302).

Note: Weighted by inverse project sample size.

4.1.3 Robustness tests

Nonresponse rates

To estimate pro-WEAI, responses are necessary for every indicator for each individual in the sample. Nonresponse, or missing data, occurs when the respondent has not answered the specific survey questions needed to calculate the indicator. For example, a respondent must be

an active member of at least one community group to be considered adequate in group membership. If the respondent has not answered the survey questions about whether they participated in groups, their response is considered missing for that indicator.¹¹

Across the five projects that collected the complete survey instrument, nonresponse rates are generally low (Table 9). Except for two indicators, access to and decisions on financial services and work balance, the proportion of missing data among men and women in dual-adult households is below 1 percent. Overall, 96 percent of respondents in these projects answered all of the questions needed to compute all 12 indicators. We observe a relatively higher proportion of nonresponse in female-only households. Notably, in 17 percent of female-only households there was only one adult living in the household. Hence, women in these households were not able to answer the questions necessary for the respect among household members indicator.

¹¹ Note that nonresponse does not refer to planned missingness or skip patterns, but rather the respondent's inability or unwillingness to respond.

Table 9. Percent nonresponse for each pro-WEAI indicator

| Indicator | Men (dual-adult) | Women (dual-adult) | Women (female-only) |
|---|------------------|--------------------|---------------------|
| <i>Intrinsic agency</i> | | | |
| Autonomy in income | 0.3 | 0.3 | 1.5 |
| Self-efficacy | 0.2 | 0.0 | 0.8 |
| Attitudes about intimate partner violence against women | 0.1 | 0.1 | 0.8 |
| Respect among household members | 0.8 | 0.9 | 17.3 |
| <i>Instrumental agency</i> | | | |
| Input in productive decisions | 0.1 | 0.1 | 0.0 |
| Ownership of land and other assets | 0.1 | 0.0 | 0.0 |
| Access to and decisions on financial services | 2.8 | 1.5 | 1.8 |
| Control over use of income | 0.1 | 0.1 | 0.0 |
| Work balance | 3.2 | 2.6 | 3.2 |
| Ability to visit important locations | 0.3 | 0.0 | 0.0 |
| <i>Collective agency</i> | | | |
| Group membership | 0.1 | 0.0 | 0.0 |
| Membership in influential groups | 0.1 | 0.0 | 0.0 |

Source: Baseline data from ANGeL (N=7,500), AVC (N=960), SE LEVER (N=2,705), TRAIN (N=9,735), and WorldVeg (N=1,302).

Note: Weighted by inverse project sample size.

Association analysis

Next, we consider associations between pro-WEAI indicators. A high correlation could result in a greater than intended implicit weight being assigned to an indicator pair. This would need to be considered and justified. Most of the 12 pro-WEAI indicators are weakly correlated with each other (Cramer's $V < 0.30$) (Table 10). There is a moderate correlation between input in productive decisions and control over use of income ($V = 0.502$), and there is a strong correlation between group membership and membership in influential groups ($V = 0.728$) which is expected because the latter is derived from the former.

In the case of input into productive decisions, control over use of income, and influence in community groups, this correlation may be a consequence of survey design, because the questions underlying these indicators are posed in sequence within the same survey module.

Yount et al. (2019) explore this issue using IRT methods and find a similar association. Follow-up cognitive testing is planned to investigate this issue.

Table 10. Association (Cramer's V) between pro-WEAI indicators

| | Autonomy in income | Self-efficacy | Attitudes about intimate partner violence against women | Respect among household members | Input in productive decisions | Ownership of land and other assets |
|---|---|----------------------------|---|--------------------------------------|-------------------------------|------------------------------------|
| <i>Intrinsic agency</i> | | | | | | |
| Autonomy in income | 1.000 | | | | | |
| Self-efficacy | 0.072 | 1.000 | | | | |
| Attitudes about intimate partner violence against women | 0.051 | 0.062 | 1.000 | | | |
| Respect among household members | 0.068 | 0.135 | 0.081 | 1.000 | | |
| <i>Instrumental agency</i> | | | | | | |
| Input in productive decisions | 0.111 | 0.083 | 0.008 | 0.044 | 1.000 | |
| Ownership of land and other assets | -0.016 | 0.112 | 0.005 | 0.090 | 0.089 | 1.000 |
| Access to and decisions on financial services | 0.115 | 0.086 | 0.030 | 0.013 | 0.173 | 0.052 |
| Control over use of income | 0.091 | 0.104 | 0.032 | 0.094 | 0.502 | 0.099 |
| Work balance | -0.014 | -0.011 | 0.018 | 0.008 | -0.020 | 0.028 |
| Ability to visit important locations | -0.061 | 0.103 | 0.006 | 0.047 | 0.029 | 0.217 |
| <i>Collective agency</i> | | | | | | |
| Group membership | 0.000 | 0.003 | -0.047 | -0.033 | 0.042 | 0.017 |
| Membership in influential groups | -0.025 | 0.020 | -0.039 | 0.005 | 0.023 | 0.076 |
| | Access to and decisions on financial services | Control over use of income | Work balance | Ability to visit important locations | Group membership | Membership in influential groups |
| <i>Instrumental agency</i> | | | | | | |
| Access to and decisions on financial services | 1.000 | | | | | |
| Control over use of income | 0.122 | 1.000 | | | | |
| Work balance | -0.010 | 0.033 | 1.000 | | | |
| Ability to visit important locations | 0.007 | 0.023 | 0.021 | 1.000 | | |
| <i>Collective agency</i> | | | | | | |
| Group membership | 0.058 | 0.039 | 0.015 | 0.073 | 1.000 | |
| Membership in influential groups | -0.002 | 0.063 | 0.051 | 0.095 | 0.728 | 1.000 |

Source: Baseline data from ANGeL (N=7,500), AVC (N=960), SE LEVER (N=2,705), TRAIN (N=9,735), and WorldVeg (N=1,302).

The correlation is expected in the case of group membership and membership in influential groups given the definition of the indicators: to be adequate in membership in influential groups, a person must be a member of a group (i.e., adequate in group membership). Defining the indicators in this way was deliberate, designed to increase the implicit weight of collective

agency within pro-WEAI, given the relative lack of collective agency indicators in the index, compared to intrinsic and instrumental agency indicators. Work already is underway to design and validate new indicators of collective agency for inclusion in future revisions of pro-WEAI.

An alternative way to examine the relationship between indicators is redundancy. Redundancy between two indicators, A and B, is defined by Alkire et al. (2015) as the proportion of respondents inadequate in indicator A who are simultaneously inadequate in indicator B, where A is the indicator in which fewer respondents are inadequate. Thus, 61 percent of respondents inadequate in autonomy in income also are inadequate in self-efficacy (Table 11). Overall, there is high redundancy among the 12 pro-WEAI indicators. Given that we do not observe a similarly high degree of correlation between all the indicators, we do not interpret high redundancy as problematic from a measurement perspective but as evidence that inadequacies tend to be clustered. Indeed, at this stage of instrument development and adaptation, redundancy allows us to adapt indicators so they provide complementary information and, if well-supported, will help streamline pro-WEAI for different purposes.

Table 11. Redundancy between pro-WEAI indicators

| | Autonomy in income | Self- efficacy | Attitudes about intimate partner violence against women | Respect among household members | Input in productive decisions | Ownership of land and other assets |
|---|---|-------------------------------------|---|---|-------------------------------------|--|
| <i>Intrinsic agency</i> | | | | | | |
| Autonomy in income | 1.000 | | | | | |
| Self-efficacy | 0.599 | 1.000 | | | | |
| Attitudes about intimate partner violence against women | 0.636 | 0.595 | 1.000 | | | |
| Respect among household members | 0.693 | 0.730 | 0.707 | 1.000 | | |
| <i>Instrumental agency</i> | | | | | | |
| Input in productive decisions | 0.889 | 0.885 | 0.881 | 0.871 | 1.000 | |
| Ownership of land and other assets | 0.871 | 0.915 | 0.877 | 0.893 | 0.901 | 1.000 |
| Access to and decisions on financial services | 0.672 | 0.663 | 0.656 | 0.667 | 0.876 | 0.874 |
| Control over use of income | 0.793 | 0.788 | 0.809 | 0.771 | 0.962 | 0.899 |
| Work balance | 0.553 | 0.560 | 0.585 | 0.649 | 0.850 | 0.865 |
| Ability to visit important locations | 0.556 | 0.613 | 0.566 | 0.695 | 0.892 | 0.939 |
| <i>Collective agency</i> | | | | | | |
| Group membership | 0.577 | 0.581 | 0.572 | 0.642 | 0.896 | 0.899 |
| Membership in influential groups | 0.557 | 0.593 | 0.566 | 0.643 | 0.921 | 0.934 |
| | Access to and decisions on financial services | Control over use of income | Work balance | Ability to visit important locations | Group membership | Membership in influential groups |
| <i>Instrumental agency</i> | | | | | | |
| Access to and decisions on financial services | 1.000 | | | | | |
| Control over use of income | 0.786 | 1.000 | | | | |
| Work balance | 0.646 | 0.777 | 1.000 | | | |
| Ability to visit important locations | 0.662 | 0.772 | 0.536 | 1.000 | | |
| <i>Collective agency</i> | | | | | | |
| Group membership | 0.706 | 0.781 | 0.528 | 0.609 | 1.000 | |
| Membership in influential groups | 0.694 | 0.807 | 0.563 | 0.648 | 0.999 | 1.000 |

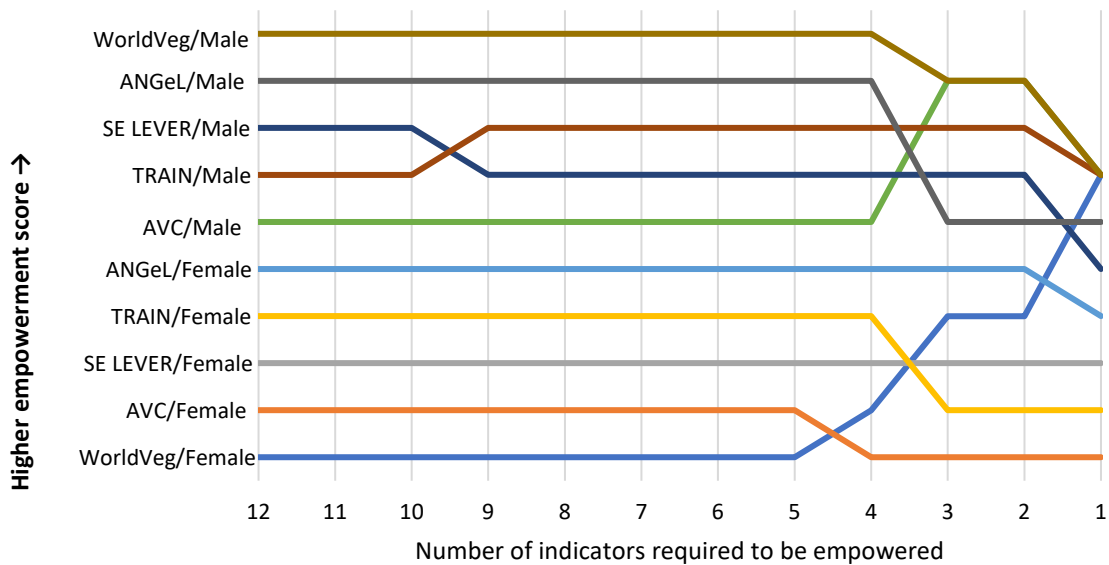
Source: Baseline data from ANGeL (N=7,500), AVC (N=960), SE LEVER (N=2,705), TRAIN (N=9,735), and WorldVeg (N=1,302).

Rank robustness

In pro-WEAI, the 12 indicators are weighted equally, and a respondent is considered empowered if s/he is adequate in at least 75 percent, or 9 of 12, of the indicators. Rank robustness analysis was performed, following Alkire et al. (2015), to assess whether changing indicator weights or empowerment cut-offs affects the comparison of pro-WEAI results between projects.

First, we rank projects' 3DE scores for different empowerment cut-offs, where a higher ranking indicates a higher 3DE score (Figure 4). We consider the full spectrum of possible cut-offs. The ranking is the same for empowerment cut-offs between five and nine indicators and registers few changes for the wider range between four and 11 indicators. Significant changes in the ranking occurs for cutoffs below four. However, we disregard these as it would be difficult to theoretically justify identifying an individual, adequate in no more than 25 percent of the indicators, as empowered. Thus, we find that changing the empowerment cut-off has little meaningful impact on comparison across projects.

Figure 4. Rank comparison of 3DE scores by project and gender for different empowerment cut-offs



Source: Baseline data from ANGeL (N=7,500), AVC (N=960), SE LEVER (N=2,705), TRAIN (N=9,735), and WorldVeg (N=1,302).

Notes: 3DE scores ranked from highest to lowest. Spearman's rho=1.000; Kendall's tau b=1.000. Weighted by inverse project sample size.

Next, we compare how projects rank by 3DE score for different indicator weighting schemes (Table 12). We consider two weighting schemes: equal weighting by indicators (the chosen scheme), in which each of the 12 indicators is given a 1/12 weight, and equal weighting by

domain, in which each of the three theoretical domains (intrinsic, instrumental, and collective agency) are given equal weight, and the indicators within each domain are evenly weighted. While there is some difference in the ranking between weighting schemes, the rank correlation coefficients are positive and high (Spearman’s rho=0.903, Kendall’s tau b=0.822), indicating high concordance between weighting schemes.

Table 12. Rank of 3DE scores by project and gender for different weighting schemes

| Project/Gender | Equally weighted by indicator | Equally weighted by domain |
|-----------------------|--------------------------------------|-----------------------------------|
| WorldVeg/Female | 1 | 1 |
| AVC/Female | 2 | 2 |
| SE LEVER/Female | 3 | 3 |
| TRAIN/Female | 4 | 4 |
| ANGeL/Female | 5 | 6 |
| AVC/Male | 6 | 7 |
| SE LEVER/Male | 7 | 9 |
| TRAIN/Male | 8 | 5 |
| ANGeL/Male | 9 | 8 |
| WorldVeg/Male | 10 | 10 |

Source: Baseline data from ANGeL (N=7,500), AVC (N=960), SE LEVER (N=2,705), TRAIN (N=9,735), and WorldVeg (N=1,302).
Notes: 3DE scores ranked from highest to lowest (1=highest score; 10=lowest score). Spearman’s rho=0.903; Kendall’s tau b=0.822. Groups where ranking differs in **bold**. Weighted by inverse project sample size.

5. Concluding remarks

In response to growing recognition that women’s empowerment is important in its own right, as well as for achieving other important outcomes such as income, health, and nutrition of women and their families, pro-WEAI was developed as a metric of women’s empowerment that captured aspects of empowerment relevant to the outcomes of agricultural development projects, as well as being more closely linked to theories of agency.

This initial version of pro-WEAI retains many of the properties of the original WEAI as a counting-based index; most important is the ability to decompose the overall index value into

its component sub-indices (3DE and GPI) or by indicator, as well as by population subgroup. The pro-WEAI responds to the demand of agricultural development projects by including indicators that are relevant to project success, such as indicators of intrinsic agency related to intrahousehold harmony, indicators of intrinsic agency based on well-validated attitudinal questions about IPV against women (Yount et al. 2016, Miedema et al. 2018), and an instrumental agency indicator of women's freedom of movement also based on survey questions that are validated across groups (Yount et al. 2016) and over time (Cheong, Yount, and Crandall 2017). The qualitative work also identified many of these indicators as important to community members. With its three-domain structure, pro-WEAI also has a closer theoretical link to the three domains of empowerment: intrinsic, instrumental, and collective agency.

The process of pro-WEAI development, with sequenced and integrated quantitative and qualitative work, illustrates the value of qualitative work and mixed methods research in general. Although the qualitative work is not a part of the quantitative index, the mixed methods approach followed in the development of pro-WEAI illustrates "pro-WEAI good practice" because qualitative data are valuable for contextualizing the index scores and revealing how project interventions affect women's empowerment. The qualitative work also showed that despite the variability in local understanding of empowerment, many of the underlying concepts can be mapped to the three domains of empowerment included in pro-WEAI: instrumental, collective, and intrinsic agency.

Pro-WEAI is still under development. Colleagues at Emory University are using item response theory methods to assess the measurement properties of a subset of pro-WEAI indicators that were measured in baseline surveys from two GAAP2 projects: the TRAIN project in Bangladesh and the Grameen Foundation project in Burkina Faso (Yount et al. 2019). A health and nutrition module examining instrumental agency related to health and nutrition decisions is being developed and validated with the nutrition-focused projects in the GAAP2 portfolio (Heckert et al., unpublished); a livestock module is also being developed and tested. Qualitative work is ongoing for some partner projects, and process evaluations are attempting to unpack pathways of impact between project strategies and achieved outcomes.

In addition, ongoing work attempts to address several limitations in the pilot survey instrument. For instance, several indicators were initially developed, based on requests from the projects, but ultimately were not included in the index. These indicators include access to information and additional indicators of collective agency. In particular, the survey question, “To what extent are you able to access information that you feel is important for making informed decisions regarding [ACTIVITY]?” included several competing value judgments, which made consistent interpretation difficult. Currently, we are developing a separate add-on module measuring access to information. We also sought to include more refined indicators of collective agency to balance this domain with intrinsic agency and instrumental agency in pro-WEAI. We experimented with an indicator of whether the respondent felt they had effective voice in groups. Unfortunately, we determined that including additional indicators of collective agency beyond the two indicators already included (group membership and membership in influential groups) was not advisable, given that few respondents were group members and all

indicators of group membership were drawn from the same survey module. Informed in part by findings from the IRT analysis (Yount et al. 2019), we currently are investigating other approaches to measuring collective agency that do not rely explicitly on membership in a group (e.g., community participation).¹²

Finally, we emphasize that pro-WEAI is being developed not only to measure empowerment in the context of agricultural development projects, but also to assess projects' impact on women's empowerment, income, nutrition, and other critical outcomes. The participating projects are conducting endline data collection with the refined survey instrument, with endline results expected in 2019. The pro-WEAI team is awaiting the results of the impact evaluations using the baseline and endline pro-WEAI surveys to be able to say, based on evidence across the 13-project portfolio, what strategies worked to empower women.

¹² The original WEAI included an indicator related to speaking in public about issues relevant to the respondent or their community. However, in the roll-out of the WEAI in Feed the Future countries, this survey module proved controversial, particularly in contexts with a history of political conflict where speaking in public was a sensitive issue (Malapit et al. 2017) and was ultimately dropped from A-WEAI.

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Appendix A: GAAP2 portfolio selection process

To select a portfolio of projects, we issued a call for expressions of interest that resulted in 80 submissions from agricultural development projects in South Asia and Africa South of the Sahara, of which 21 were invited to submit full proposals. Criteria for selection included being gender-aware or gender-sensitive in project design, with a solid M&E framework, and a well-designed impact evaluation plan based on quantitative data and plans (or willingness) to undertake qualitative data collection.

Of the 21 projects, 16 were invited to participate in an inception workshop in which they identified indicators that they thought should be included in pro-WEAI. Despite overall feedback that the WEAI was too long, projects identified several new indicators of empowerment that they wanted included.¹³ Hence, the list of potential indicators, and consequently the baseline data-collection instrument for the pro-WEAI pilot, was even longer than in the WEAI.¹⁴

Of the 16 projects at the inception workshop, 13 projects were selected for the GAAP2 portfolio. Final selection criteria included ensuring that projects focused on either crops or

¹³ Indicators proposed at the GAAP2 inception workshop included mobility, attitudes about gender-based violence, access to information, access to and control over land, influence over group decisions, responsibility for repayment of loans, intrahousehold dynamics, access to markets, and decision-making about food purchases, preparation, health, and childcare, among others.

¹⁴ GAAP2 projects have reported that time to implement pro-WEAI ranges from 40 to 120 minutes, depending on the context and survey firm. Time to implement was not collected for the original 2011 pilot surveys; however, a subsequent round of testing conducted in 2014 suggests that the original WEAI questionnaire required between 37 and 62 minutes to complete (Malapit et al. 2017).

livestock and had income-oriented or nutrition-oriented objectives (though, in practice, many projects included both crops and livestock, income, and nutrition objectives). The final set of projects is given in Table 1.

These projects provided input in designing the questionnaire, and ultimately, fielded the pilot pro-WEAI survey instrument as part of their impact evaluation efforts. The projects also undertook qualitative work to validate the concepts of empowerment in each context, using protocols that were adopted throughout the portfolio (see Meinzen-Dick et al. nd).

Appendix B: Computation of the index

Computation of the pro-WEAI follows the methodology of the original WEAI (Alkire et al. 2013).

Pro-WEAI is calculated as the weighted mean of two sub-indices: the Three Domains of Empowerment Index (3DE), with a weight of 90 percent, and the Gender Parity Index (GPI), with a weight of 10 percent. The 3DE measures women’s empowerment across three domains: **intrinsic agency** (power within), **instrumental agency** (power to), and **collective agency** (power with). The GPI compares the empowerment scores of the eligible individual and her spouse in each household. The choice of weights for the two sub-indices follows the original WEAI, placing greater emphasis on the 3DE while still recognizing the importance of gender equality as an aspect of empowerment. Improvements in either the 3DE or GPI will increase pro-WEAI scores.

Appendix B.1 Three Domains of Empowerment Index (3DE)

To measure empowerment, we focus on the areas of disempowerment that must be overcome. We start by computing an index of disempowerment, M_0 , using the Alkire-Foster method—an axiomatic and counting-based approach designed originally for measuring multidimensional poverty (Alkire and Foster 2011). This index captures the percentage of women who are disempowered, as well as the average share of inadequacies that they experience. This index varies between 0, when no one is disempowered, and 1, when everyone is disempowered and inadequate in all indicators. The 3DE is defined as $(1 - M_0)$. This approach focuses on disempowered women and allows us to identify the key issues that need to be addressed to increase empowerment. We describe below the steps to compute the 3DE using a notation consistent with the M_0 measurement (Alkire and Foster 2011).

(i) Identify inadequacies. For each of the 12 indicators described in the previous section, a person is identified as adequate or inadequate. Person i is inadequate in indicator j if his or her level of achievement, x_{ij} , is below the adequacy cut-off z_j . To each person in each indicator, we assign an inadequacy status $g_{ij} = 1$, if $x_{ij} < z_j$, and $g_{ij} = 0$, otherwise.

(ii) Create the inadequacy score. For each person, the inadequacy score, c_i , is calculated by summing the inadequacy status of all indicators, each multiplied by their corresponding weight (w_j). More formally, $c_i = \sum_{j=1}^{12} w_j \times g_{ij}$. In pro-WEAI, all 12 indicators are equally weighted, and thus $w_j = 1/12$. The inadequacy score represents the share of indicators in which a person is inadequate.

(iii) Identify the disempowered. To identify who is disempowered, we compare a person's inadequacy score with the disempowerment cut-off, $k \in (0,1]$. The disempowerment cut-off is the share of (weighted) inadequacies an individual must have to be considered disempowered. Thus, a person is identified as disempowered if $c_i > k$, and empowered, otherwise.¹⁵ In pro-WEAI, k is set at 0.25, and thus a person is identified as disempowered if they are inadequate in at least 4 of the 12 indicators.

¹⁵ In pro-WEAI, as in WEAI, we define the disempowerment cut-off as strict ($c_i > k$), rather than weak ($c_i \geq k$), as in Alkire and Foster (2011).

(iv) Compute the disempowerment headcount ratio. The disempowerment headcount ratio or the percentage of women who are disempowered, H_p , is $\frac{q}{n}$, where q is the number of women identified as disempowered and n is the total number of women.

(v) Compute the intensity of disempowerment. To focus measurement on the situation of the disempowered, we censor the inadequacy scores.¹⁶ The censored inadequacy score, $c_i(k)$, for individual i is equal to the inadequacy score if the individual is disempowered (i.e., if $c_i > k$, then $c_i(k) = c_i$). The censored inadequacy score, $c_i(k)$, is equal to zero if the individual is empowered (i.e., if $c_i \leq k$, then $c_i(k) = 0$). The intensity (or breadth) of disempowerment (A_p) is the average inadequacy score of disempowered women:

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

(vi) Compute the index of disempowerment M_0 and the 3DE. With M_0 , the disempowerment headcount ratio is adjusted for the intensity of disempowerment. M_0 is calculated as the product of the disempowerment headcount ratio and the intensity of disempowerment, $M_0 = H_p \times A_p$, or, more simply, as the average censored inadequacy score among women:

$$M_0 = \frac{1}{n} \sum_{i=1}^n c_i(k).$$

The 3DE is easily obtained:

¹⁶ Alternatively, we could choose not to censor the inadequacy scores. While ostensibly simpler, this approach would not allow for distinguishing between areas of disempowerment common among disempowered individuals and areas of disempowerment common among empowered individuals.

$$3DE = 1 - M_0 = 1 - H_p \times A_p.$$

Although based on M_0 , the 3DE also can be expressed equivalently as:

$$3DE = H_e + H_p \times A_e,$$

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

M_0 has two properties that can be useful for understanding disempowerment and analyzing the effects of a project: dimensional breakdown and subgroup decomposition.

a) Dimensional breakdown

M_0 can be decomposed into the contribution of each indicator. This can be useful for diagnostic purposes—understanding which indicators to target to achieve greater increases in empowerment—and reveals broad patterns of how people are disempowered. Continuing our focus on the inadequacies of the disempowered, we begin the decomposition by censoring the inadequacy status for each individual, replacing with zero the inadequacies of the empowered (as above, $g_{ij}(k) = g_{ij}$ if $c_i \geq k$ and $g_{ij}(k) = 0$, otherwise). Then, we compute the censored inadequacy headcount ratios. The censored inadequacy headcount ratio of indicator j , denoted $h_j(k)$, is the proportion of the population that is both disempowered and simultaneously inadequate in that indicator. Formally:

$$h_j(k) = \frac{1}{n} \sum_{i=1}^n g_{ij}(k).$$

Thus, M_0 can also be written as the weighted sum of the censored headcount ratios:

$$M_0 = \sum_{j=1}^d w_j \times h_j(k).$$

The absolute contribution to disempowerment of indicator j is $w_j \times h_j(k)$ and the relative contribution is $\frac{w_j \times h_j(k)}{M_0}$. Whenever the relative contribution to disempowerment of an indicator greatly exceeds its weight, this suggests that the disempowered are disproportionately more inadequate in this indicator compared to other indicators.

b) Subgroup decomposition

M_0 also can be disaggregated by subgroups, such as treatment arms, depending on sample design and as long as the respective groups are mutually exclusive and exhaustive of the total sample (Alkire et al. 2015).¹⁷ Disaggregating M_0 , and more generally pro-WEAI, by subgroup requires that the underlying data are statistically representative of the subgroup. The subgroup decomposition is calculated as:

$$M_0 = \sum_{l=1}^m \frac{n^l}{n} M_0^l,$$

where M_0^l denotes the M_0 of group $l \in [1, m]$ and $\frac{n^l}{n}$ denotes the population share of that same group. Thus, the relative contribution to disempowerment of group l is $\frac{\frac{n^l}{n} \times M_0^l}{M_0}$. As before,

whenever the relative contribution to disempowerment of a group greatly exceeds its

¹⁷ Before decomposing by subgroups, it is ideal to test for (and confirm) measurement invariance by subgroups. Confirming measurement invariance allows us to assume that the same trait is being measured in both subgroups. For subgroups in which no population differences are expected, such as a randomly assigned treatment arm, this is not necessary.

population share, this suggests that the group may bear a disproportionate share of disempowerment.

Appendix B.2 Gender Parity Index (GPI)

The GPI focuses on the difference between the inadequacy scores of the eligible woman and her spouse within each household. In contrast to the 3DE, which focuses on women's inadequacy scores and is based on the full sample of women, the GPI involves the calculation of inadequacy scores for men and women and is based on the sample of dual-adult households (i.e., comprised of at least one woman and one man). Although in most cases the two adults compared will be a woman and her spouse, this is not a requirement.

Similar to the 3DE, the GPI is defined in terms of empowerment. Its construction stems from the identification of households that lack gender parity. The steps to construct the GPI are described below.

(i) Censor the inadequacy scores for gender parity. The inadequacy scores of men or women who are empowered, i.e., whose inadequacy scores are less than or equal to the disempowerment cut-off k , are replaced by the value of k (rather than zero as in the computation of the 3DE). The new censored inadequacy score, denoted as $c'_i(k)$ to differentiate it from the 3DE, is defined as follows: $c'_i(k) = c_i$ if $c_i > k$, and $c'_i(k) = k$ if $c_i \leq k$.

(ii) Identify households lacking gender parity. A household lacks gender parity if the woman is disempowered and her new censored inadequacy score is higher than the new censored inadequacy score of her male counterpart. Formally, household j lacks gender parity if

$c'_j(k)^W > k$ and $c'_j(k)^W > c'_j(k)^M$, where $c'_j(k)^W$ and $c'_j(k)^M$ are the censored inadequacy scores of the eligible woman and spouse, respectively. Put differently, a household is identified as achieving gender parity if the woman is empowered or, if she is not empowered, her inadequacy score is equal or lower than that of the man in her household.

(iv) Compute the proportion of households lacking gender parity. The proportion of households where women lack gender parity relative to their male counterparts, (H_{GPI}) is r/m , where r is the number of households classified as lacking gender parity and m is the total number of dual-adult households in the sample.

(v) Compute the average empowerment gap. The empowerment gap captures the extent of the disparity between women's and men's inadequacy scores in households that lack gender parity. It is calculated as the average relative gap in the censored inadequacy scores between women and men living in households that lack gender parity:

$$I_{GPI} = \frac{1}{r} \sum_{j=1}^r \frac{c'_j(k)^W - c'_j(k)^M}{1 - c'_j(k)^M}.$$

(vi) Computing the GPI. The GPI combines the two last figures: the percentage of women who lack gender parity and the average empowerment gap:¹⁸

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

Like the 3DE, the GPI is decomposable by subgroups.

¹⁸ The GPI is equivalent to one minus a "poverty gap" or P_1 measure of the Foster- Greer-Thorbecke (1984) family of poverty measures.

Appendix C: Demographic characteristics of respondents by project

| | ANGeL | | AVC | | SE LEVER | | TRAIN | | WorldVeg | |
|--------------------------------|-------|-------|-------|-------|----------|-------|-------|-------|----------|-------|
| | F | M | F | M | F | M | F | M | F | M |
| N | 3,903 | 3,597 | 491 | 469 | 1,440 | 1,265 | 5,011 | 4,724 | 668 | 634 |
| Age (%) | | | | | | | | | | |
| 16-25 years | 37.61 | 5.53 | 10.39 | 1.92 | 22.01 | 2.77 | 62.34 | 16.08 | 5.05 | 9.68 |
| 26-45 years | 59.83 | 75.23 | 61.91 | 40.51 | 67.99 | 57.31 | 36.67 | 75.49 | 62.3 | 70.94 |
| 46-65 years | 2.41 | 14.85 | 27.7 | 55.65 | 9.31 | 33.52 | 0 | 7.58 | 28.86 | 16.46 |
| >65 years | 0.08 | 4.23 | 0 | 1.92 | 0.35 | 6.32 | 0 | 0.85 | 3.15 | 2.82 |
| Missing | 0.08 | 0.17 | 0 | 0 | 0.35 | 0.08 | 1 | 0 | 0.63 | 0.1 |
| Highest level of education (%) | | | | | | | | | | |
| Never attended school | 10.91 | 26.33 | 41.14 | 42.64 | 82.99 | 67.91 | 7.66 | 26.69 | 80.99 | 67.35 |
| Less than primary | 11.5 | 17.71 | 19.35 | 17.48 | 8.06 | 13.2 | 13.19 | 19.3 | 17.51 | 28.39 |
| Primary | 62.03 | 40.98 | 33.81 | 30.06 | 4.86 | 7.43 | 66.63 | 43.6 | 0 | 0 |
| Secondary | 15.55 | 14.87 | 5.7 | 8.96 | 0 | 0.08 | 12.5 | 10.33 | 1.5 | 3.94 |
| Undergraduate or higher | 0 | 0 | 0 | 0.85 | 0 | 0 | 0 | 0 | 0 | 0 |
| Missing | 0 | 0.11 | 0 | 0 | 4.1 | 11.38 | 0.02 | 0.08 | 0 | 0.32 |

Source: Baseline data from ANGeL (N=7,500), AVC (N=960), SE LEVER (N=2,705), TRAIN (N=9,735), and WorldVeg (N=1,302). F stands for female; M stands for male.

Appendix D: Percent of the pro-WEAI sample dropped from index calculations

| | Total sample size | Sample size used for pro-WEAI calculations | Percent dropped from pro-WEAI calculations |
|----------|-------------------|--|--|
| ANGeL | 7,523 | 7,500 | 0.31% |
| AVC | 1,000 | 960 | 4.00% |
| SE LEVER | 3,342 | 2,705 | 19.06% |
| TRAIN | 9,823 | 9,735 | 0.90% |
| WorldVeg | 1,408 | 1,302 | 7.53% |
| Total | 23,096 | 22,202 | 3.87% |

Source: Baseline data from ANGeL, AVC, SE LEVER, TRAIN, and WorldVeg. **Note:** Respondents who had not answered survey items related to all 12 pro-WEAI indicators were dropped from the index calculations.

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www.ifpri.org

IFPRI HEADQUARTERS

1201 Eye Street, NW
Washington, DC 20005 USA
Tel.: +1-202-862-5600
Fax: +1-202-862-5606
Email: ifpri@cgiar.org