IFPRI

MYANMAR

STRATEGY SUPPORT PROGRAM | WORKING PAPER 17

APRIL 2022

Impact of a gender and nutrition behavioral change communication amid the COVID-19 crisis in Myanmar's Central Dry Zone

USAID FROM THE AMERICAN PEOPLE

FEED THE FUTURE The U.S. Government's Global Hunger & Food Security Initiative

LIFT Livelihoods and Food Security Fund

managed by UNOPS

CONTENTS

TABLES

FIGURES

ABSTRACT

Social behavior change communication (SBCC) interventions on gender and nutrition are now commonly implemented, but their impact on diet quality and empowerment is rarely assessed rigorously. We estimate the impact of a nutrition and gender SBCC intervention on women's dietary diversity and empowerment in Myanmar during an especially challenging period—the first year of the COVID-19 pandemic. The intervention was implemented as a cluster-randomized controlled trial in 30 villages in Myanmar's Central Dry Zone. Our analysis employs data from the baseline survey implemented in February 2020 and a phone survey implemented in February–March 2021 and focuses on women's dietary diversity and sub-indicators of the project-level women's empowerment in agriculture index (pro-WEAI). Two indicators of women's empowerment—inputs to productive decisions and access to and decisions over credit—improved, indicating that SBCC interventions can contribute to changing gendered perceptions and behaviors; however, most of the empowerment indicators did not change, indicating that much of gendered norms and beliefs take time to change. Women's dietary diversity scores were higher by half a food group out of 10 in treatment villages. More women in treatment villages consumed nuts, milk, meat or fish, and Vitamin A–rich foods daily than in control villages. We show that even in the setting of a pandemic, a SBCC intervention can be delivered through a range of tools, including household visits, phone-based coaching, and voice-based training, that are responsive to local and individual resource limitations. Gender messaging can change some gendered perceptions; but it may take more time to change deeply ingrained gender norms. Nutrition messaging can help counter the declines in dietary quality that would be expected from negative shocks to supply chains and incomes.

1. INTRODUCTION

Gender and nutrition SBCC interventions aim to increase women's empowerment and improve nutrition outcomes. The contexts, content, and application modalities in which SBCC interventions are applied vary widely, as does the range of outcome measures on which SBCC interventions are assessed. Gender and nutrition SBCC interventions are often implemented and evaluated in combination with—or as an add-on to—other project activities, such as nutrition-sensitive agricultural projects (see Ruel et al. 2018) or cash transfer projects (Little et al. 2021). Many nutrition SBCC interventions target expecting mothers and mothers of young children, intending to increase their uptake of improved maternal nutrition, improved health-seeking and hygiene related behaviors, and infant and young child feeding practices. Evidence of such interventions often shows positive outcomes (e.g., in Bangladesh, Ethiopia, and Vietnam as described by Menon et al. 2020, in Myanmar by Maffioli and Field 2021, and in the meta-analysis by Margolies et al. 2022), though a meta-review of interventions combining cash with and without nutrition SBCCs found no conclusive positive impact of the SBCC component on nutrition outcomes (Little et al. 2021).

While the focus is largely on young children and expecting mothers, there is less evidence from interventions in which nutrition SBCC is for other women and men especially in areas where nutrition indicators are poor and there is lack of awareness and knowledge of nutrition- and health-related practices. Moreover, few studies evaluate SBCC in the absence of an additional major intervention (such as agricultural trainings or cash supplements) (Quisumbing et al. 2021a; Ruel et al. 2018). An intervention focusing on increasing agricultural diversity, which included a gender sensitization and nutrition SBCC, increased women's empowerment in Zambia (Kumar et al. 2018) but did not affect women's dietary diversity scores (Rosenberg et al. 2018). In the context of nutrition-sensitive agriculture programs, Quisumbing et al. (2021a) find positive impacts of a nutrition-sensitive agricultural project in Bangladesh on women's empowerment. Yet treatment impacts are not significantly different among interventions that did and did not include nutrition SBCC and gender sensitization, casting doubt on the SBCC impact. The authors do not describe the nutrition impacts of the project. In contrast, a study of an economic graduation program in Burkina Faso finds significantly better empowerment outcomes when "family coaching" was offered (Karimli et al. 2021). Despite well-articulated theories, little evidence exists to support an association between women's empowerment and nutrition. When such evidence does exist, it comes with trade-offs between different dimensions of women's empowerment (Quisumbing et al. 2021b).

There are major concerns regarding potential negative impacts related to the COVID-19 pandemic on nutrition and women's empowerment, among others. The pandemic may have affected diets through different pathways: lower household incomes may necessitate lowering food expenditures (Gupta et al. 2021; Kansiime et al. 2021); mobility restrictions may reduce food access (Kansiime et al. 2021); residents may face lower food availability or increased food prices (Akter 2020; Narayanan and Saha 2021; Ruan, Cai, and Jin 2021); and the pandemic may also affect behaviors and attitudes toward diets (Nakamura, Shirai, and Sakuma 2021; Niles et al. 2021). Reduced incomes and social distancing measures may also negatively affect mental health, increase stress and anxiety, and lead to changing or even worsening intrahousehold relations (Aguero 2021; Rahman, Hasnain, and Islam 2021). It is critical to understand what might help mitigate such negative impacts, and whether SBCC may be such a mitigation option.

This study was initially designed as a randomized controlled trial to assess the causal impact of a nutrition and gender SBCC on enhancing crop diversification, dietary diversity, and gender equality for future integration and scaling up in agricultural and irrigation projects in villages in Myanmar's Central Dry Zone. Baseline data were collected before the onset of the pandemic. The COVID-19 crisis delayed implementation of the gender and nutrition SBCC; once community and household

engagements were allowed and safe, the implementation was flexibly adapted to the circumstances. The implementation modalities were adjusted to suit local restrictions and to abide by social distancing and other necessary precautions. Group-based trainings were mainly replaced with a combination of household visits in June and July, followed by a series of phone-based coaching in September and October, and finally group- and voice-based training with a maximum of 30 participants at a time by December 2020 and January 2021.

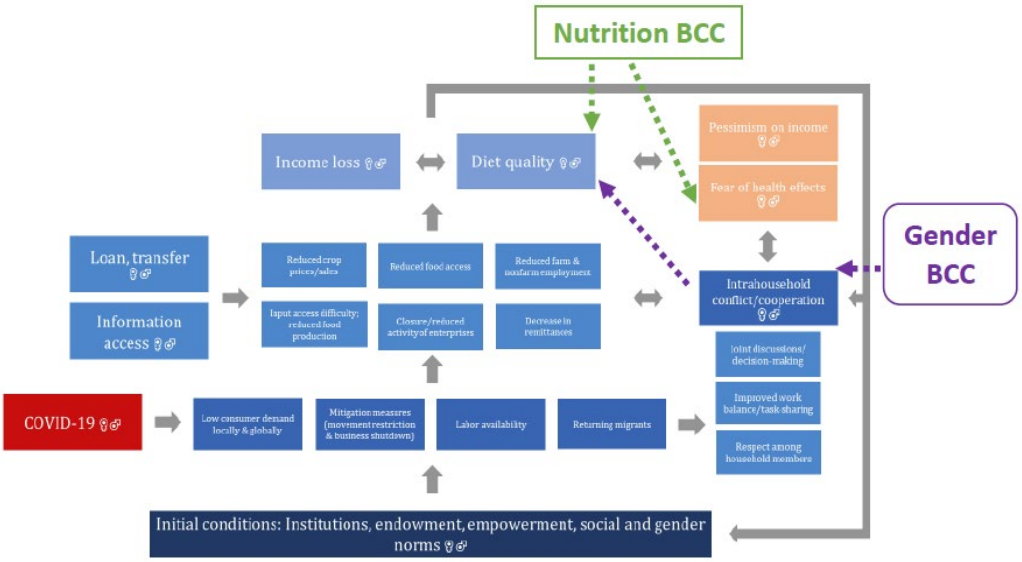
The COVID-19 crisis allows the study to provide insights on the effectiveness of this SBCC intervention as a mitigation strategy to maintain or improve dietary quality and women's empowerment in rural areas in the face of crisis. Our work contributes to the literature in four major ways. First, we offer a rigorous assessment of the impact of a gender and nutrition SBCC intervention only—that is, not in combination with other project activities and interventions. Second, we assess an intervention aimed to improve dietary quality and gender outcomes among all ages—as opposed to interventions focusing particularly on maternal nutrition and infant and young child feeding practices. Third, this paper is among the first to evaluate such an intervention taking place during the first year of the COVID-19 pandemic. Using midline data based on two rounds of phone survey data, Ragasa et al. (2021b) show that midway through the intervention the nutrition-focused SBCC already had a significant positive impact on women's diet diversity. We improve and add to this evidence of the SBCC effectiveness by evaluating the endline impact of the full intervention on dietary quality, and we also assess its impact on women's empowerment. By employing baseline data and new phone survey data from both male and female decision-makers exactly one year after the baseline study and after completion of the full intervention, this study complements the earlier work and avoids concerns regarding seasonality in food consumption patterns. Fourth, we also provide empirical evidence on the association of women's empowerment and dietary diversity.

The paper is organized as follows. Section 2 shows the potential impact pathways of the COVID-19 pandemic and the mitigation potential of a nutrition and gender SBCC in this setting. Section 3 explains the study background, followed by a description of the methodology in section 4. We then provide the results and a concluding discussion.

2. IMPACT FRAMEWORK OF GENDER AND NUTRITION SBCC DURING COVID-19

A major shock such as COVID-19 affects a multitude of factors that potentially lead to changes in women's diet quality and empowerment. The diagrammatic framework in Ragasa et al. (2021a) shows possible impact pathways of COVID-19 on rural livelihoods, particularly income loss, negative expectations regarding income and health impacts, and challenges to intrahousehold cooperation. In figure 1, we explore what one might expect from a nutrition and gender SBCC intervention in this context.

Figure 1. Mitigation pathways of nutrition and gender SBCC interventions on rural women's diet quality and empowerment during COVID-19



Source: Authors' adaptation of Ragasa et al. (2021a)

The gender and nutrition SBCC interventions are not expected to affect incomes and livelihoods directly, but they should affect participants' awareness and knowledge on good health and nutrition practices, and on improving intra-household and gender relations, thus potentially affecting attitudes and choices (figure 1). Nutrition messages encourage maintaining or increasing dietary diversity. They may also help disprove misinformation and myths regarding nutrition and COVID-19's impact such as the concerns over the safety of meat and fish consumption during the pandemic (Ragasa et al. 2021). The gender SBCC should then improve mutual respect, encourage joint decision-making, and contribute to positive intrahousehold relations.

In addition to these more straightforward and anticipated impacts, additional pathways to improved nutrition and empowerment may appear. Most notable is the complementary gender component of the intervention as a potential pathway for improving dietary quality. Theory predicts that women's empowerment and gender equality are linked to positive household welfare outcomes including better nutrition (World Bank 2012). Shifting aspects of intrahousehold dynamics between women and men—including division of work and decision-making, particularly food decisions related to purchases and preparation—could result in positive nutrition and well-being impacts for both women and other household members (Ahmed et al. 2018; Farnworth et al. 2015).

Evidence on whether increased women's empowerment and gender equality effectively improve maternal and child nutrition outcomes is inconclusive (Santoso et al. 2019). They argue however that the lack of significant associations is likely related to limitations in study design and encourage further research on this topic. Recent empirical evidence in six countries in Africa and Asia shows only a few significant associations between aggregate empowerment scores and nutritional outcomes (Quisumbing et al. 2021b). Indicators of greater direct involvement in agricultural production (a greater number of agricultural decisions, greater autonomy in production, a greater number of agricultural assets owned) are associated with lower women's dietary diversity scores, whereas greater confidence in speaking in public is associated with higher scores.

Impacts on empowerment may also originate from the organization of trainings as such and not necessarily from a gender-focused SBCC. In Bangladesh, a nutrition training added to food or cash transfers not only improved nutrition outcomes and knowledge (Ahmed, Hoddinott, and Roy 2019; Hoddinott et al. 2018) but also resulted in sustained improvements in women's empowerment (Roy

et al. 2019). In another study in Bangladesh, Quisumbing et al. (2021a) find positive empowerment impacts of an agricultural training but no significant difference in impact for those to with access to additional gender and nutrition SBCC. The authors offer several potential explanations. Participants may experience improvements in social capital due to either interactions with other training participants or increased respect within the community because of their improved knowledge. Participants may also feel a greater sense of agency due to the trainings. Also, inviting men and women jointly to trainings likely increases joint decision-making around topics covered in the training.

3. STUDY BACKGROUND

3.1 COVID-19 in Myanmar

The direct health impacts of COVID-19 in Myanmar were relatively low during the first year of the pandemic. By January 31, 2021, a total of 3,131 persons were confirmed to have died from COVID-19 (World Health Organization, 2021). Nevertheless, the country's public and economic life was strongly affected by nationwide and locally implemented mitigation measures, including stay-at-home orders, travel restrictions, and closures of schools and nonessential businesses. Moreover, measures implemented by neighboring and other countries also strongly affected Myanmar's economy through border closures, a dwindling supply of raw materials for certain industries, and importantly a reduction of remittances from international migration (Diao and Mahrt 2020; Boughton et al. 2021).

Both urban and rural households in Myanmar were affected by the pandemic. By October 2020, more than four-fifths of households in Myanmar reported a drop in income since the beginning of the year (CSO, MoPFI, and UNDP 2020). Between 2019 and 2020, this drop amounted to an average decline of 46.5 percent in household income. Income reductions were found to be larger for urban (49 percent) than for rural households (41 percent) (ibid.). Similarly, Headey et al. (2022) show large reductions in incomes among their sample of young households in urban Yangon and in the rural Dry Zone in 2020.

In our case study area in the Central Dry Zone, more than half of all households experienced income loss between February and June 2020 (Ragasa et al. 2021a), whereas 57 percent noted decreased income in June–July 2020 and 72 percent in August–September 2020 (during the second wave of COVID-19) (Lambrecht et al. 2020a). Transfers and loans could not substantially ease the income effect of the pandemic, and more than a third of households reported reducing their meat and fish consumption in response to income loss (Lambrecht et al. 2020a).

At the national level, food availability was not seriously hampered during the first year of the pandemic (Oo et al. 2020). Food prices, including rice—the main staple—were mostly stable (Goeb et al. 2021; Goeb et al. 2022); however, Goeb et al. (2021) document significant disruptions to the agri-food sector such as transportation restrictions, reduced operations, and employee layoffs. The livestock sector, including egg and chicken production, was strongly affected by lockdowns, with ensuing strong consumer price fluctuations. For example, eggs—a critical component of healthy diets in Myanmar—were reported to be up to 10 percent more expensive than usual.

3.2 Gender and nutrition in Myanmar

Several factors contribute to the impression of Myanmar society as one with high gender equality (Akter et al. 2017; Lambrecht and Mahrt 2019; Winterberger 2017). Myanmar women are active in the public domain (Winterberger 2017), and three-quarters of married women in Myanmar are employed (MoHS/Myanmar and ICF 2017). Girls and boys attend schools at roughly similar rates, and the gender gap in literacy rates is small among the younger generations (DoP 2017). Women

manage household income and expenditure, and household members' perception is that they "co-own" land and assets and make many decisions jointly (Akter et al. 2017; Lambrecht and Mahrt 2019). Myanmar's Gender Development Index, too, indicates medium to high equality in human development achievements between women and men (UNDP 2019).

Nevertheless, clear gender disparities exist and gender norms around women's roles in domestic care and men's roles in farming and entrepreneurship limit women's contributions to decision-making in farming (Carnegie et al. 2020; GEN 2015; Lambrecht and Mahrt 2019). Women contribute substantially to agricultural work at home and as wage workers (Akter et al. 2017; Lambrecht, Mahrt, and Cho 2021), yet women's names rarely appear on land documents and women are rarely part of agricultural groups (Carnegie et al. 2020; Lambrecht, Mahrt, and Cho 2021). Women also seldomly hold community-, regional-, or national-level leadership positions (GEN 2015). Moreover, acceptance rates of intimate partner violence are high—nearly half of all men and women believe that a husband is justified in beating his wife (MoHS/Myanmar and ICF 2017).

Regarding nutrition, the Myanmar population experiences a triple burden of underweight, micronutrient deficiency, and overweight or obesity. Using data from 2015–16, Hong et al. (2018) estimates that 14.1 percent of adult women in Myanmar are underweight, whereas 28.1 percent are overweight and 13.1 percent obese. Poor dietary practices are driven in part by the high price of nutrient-dense foods relative to the price of rice (Mahrt et al. 2019). A majority of households overconsume staples—particularly rice—and under consume micronutrient-dense food groups (ibid).

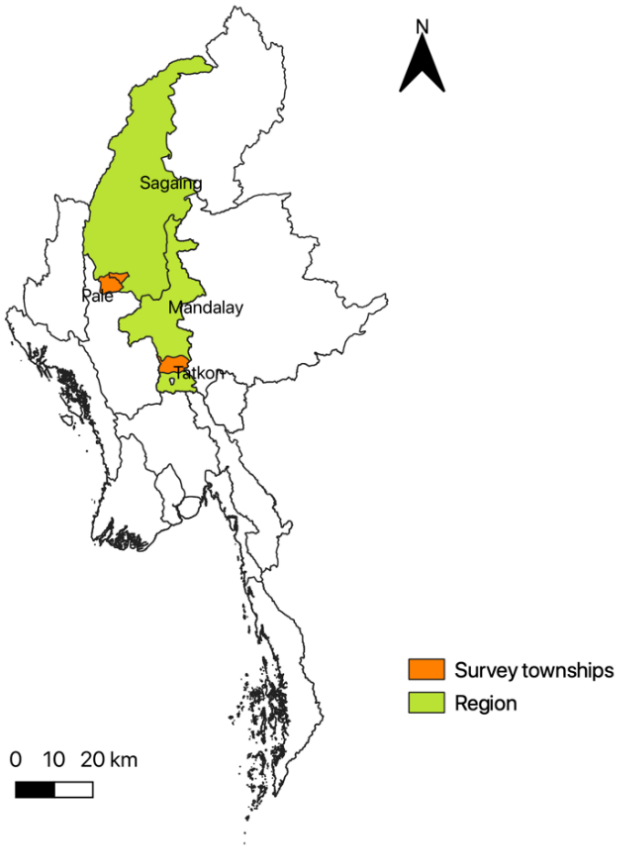
Nationally, 28 percent of children below five years old are stunted and 7 percent suffer from wasting (Blankenship et al. 2020). Field and Maffioli (2021) evaluate the impact of a maternal cash transfer program supplemented with SBCC, which was implemented between 2016 and 2019 in Myanmar's Dry Zone. Cash transfers both with and without SBCC improved the take-up of prenatal care and lead to higher levels of food consumption. However, the transfer significantly reduced child stunting, an indicator of chronic malnutrition, only if combined with SBCC. The intervention successfully improved maternal health behaviors, increased children's total calories and protein consumption, and improved child dietary diversity.

4. METHODOLOGY

4.1 Study site and intervention

This study focuses on 30 rural communities in the Central Dry Zone. The communities are located in the catchment areas of two irrigation sites: (1) Sinthe in Tatkone township in the Nay Pyi Taw region and (2) North Yamar in Pale and Yinmabin townships in the Sagaing region (figure 2). Rice is primarily grown in the irrigation sites, and other crops such as legumes and oilseeds are grown in nonirrigation (upland) areas. Compared to average households in the Central Dry Zone, the households in these communities likely have greater economic opportunities coming from irrigation water access, relatively good infrastructure, and better access to markets (Ragasa et al. 2020).

Figure 2. Location of the study sites



Source: Ragasa et al. 2020

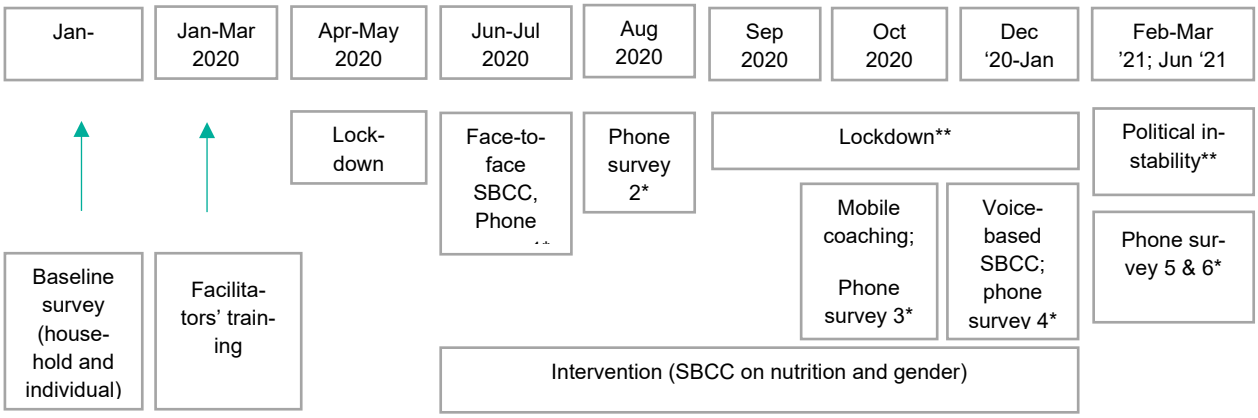
A SBCC intervention on gender and nutrition was implemented in June, July, October, and December 2020 (figure 3), as a cluster-randomized controlled trial. The villages are relatively homogeneous, and it was expected that there might be strong information spillover within each village but limited spillover across villages, thus justifying clustering and randomization at the village level. Villages were randomly assigned to the treatment group (15 villages receiving the SBCC) and the control group (15 villages not receiving the SBCC). In each village, 29–32 households were randomly selected for the baseline survey, for totals of 453 treatment households (those intended to receive SBCC) and 465 control households (those not intended to receive SBCC).

The Myanmar Institute of Gender Studies (MIGS) managed and implemented the SBCC. The nutrition information component drew on training materials developed by Leveraging Essential Nutrition Actions to Reduce Malnutrition (LEARN).[1] LEARN's modules have been frequently used and are fully adapted to the Myanmar context. The modules cover nutrition basics, family nutrition, access to nutritious foods, food preparation, and diet-related taboos (LEARN 2015). Save the Children and its partners who developed LEARN trained the MIGS nutrition facilitators to implement the nutrition component of our SBCC. The gender messaging addresses gender and nutrition, as well as gender equality and equity, gender socialization, gender stereotyping, intra-household decision-making, gender-based violence, sex and gender, power, and patriarchy. Materials for the gender information component were based on MIGS training materials. Both the nutrition and gender

[1] LEARN was funded by Livelihoods and Food Security Trust Fund (LIFT) and implemented by Save the Children, Action Contre la Faim, and Helen Keller International in support of LIFT's nutrition programming in Myanmar.

training curriculum were informed by and adjusted to the local context based on gaps and constraints identified through community interviews, scoping field work and in the baseline survey.

Figure 3. Time frame of the study



Source: Authors' illustration.
Note: *Phone survey 1 implemented in June 2020 asks respondents' experiences from February to May 2020 (onset of the pandemic), Phone survey 2 implemented in August 2020 asks about experiences in June–July 2020, Phone survey 3 implemented in October 2020 asks about experiences in August–September 2020, Phone survey 4 implemented in December 2020 asks about experiences in October–November, Phone survey 5 implemented in February–March 2021 asks about experiences in December 2020–January 2021, and Phone survey 6 implemented in June 2021 asks about experiences in March–May 2021. The food group recall for measurement of dietary diversity pertains to the day before the interview. **COVID-related lockdown and mobility restrictions and political instability are ongoing as of the writing of this paper.

Nutrition and gender training was planned to consist of monthly engagements with households from the treatment communities, alternating group-level meetings with household- and individual-level coaching. However, the intervention was ultimately modified to adhere to COVID-19-related measures and restrictions (figure 3). After an initial lockdown period in April and May, COVID-19 restrictions became less stringent, though social gatherings and group trainings were still prohibited. A one-on-one household visit, including distribution of materials and coaching took place in June 2020. This was followed by an additional household visit for a coaching session in July 2020. All of these were implemented while following careful preventive COVID-19 measures. To enable comparison between women and men on agency, decision-making, and nutrition-related knowledge and practices, one female adult and, when possible, one male adult was selected in each household to participate in the trainings. Selections were based on decision-making in terms of livelihoods and food purchases and preparation.[2] Households without female adults were not selected, and 12 percent of trained households have only female adults.

As cases began to rise in August, renewed restrictions prevented in-person engagements, and training converted to monthly phone-based monitoring and coaching in September and October 2020.Phone numbers to reach men and women separately had been collected during the household visits and facilitators were thus able to contact both the male and female training participants for phone-based activities. For cases in which both adults use the same cell phone number, the phone was passed to each participant so that each participant could join these activities.

In December 2020 and January 2021, one group-based training was organized in each target community. The voice-based training was a group-based training implemented in December 2020

[2] This is consistent with the selection of two respondents (of opposite sex) as in the Women's Empowerment in Agriculture Index (WEAI) methodology (Malapit et al. 2019).

and January 2021; trainings were recorded in advance and played by the community facilitators.[3] To adhere to local COVID-19-related restrictions, the maximum number of participants allowed was 30 people. Because of these restrictions, participants of the group-based training were limited to one participant per household. The gender makeup of these trainings was roughly equally distributed between men and women.

4.2 Survey sample and data collection

This assessment is based on data collected exactly one year after the baseline survey (February–March 2021) in a fifth phone survey round (see figure 3 and table A1). This survey asked about respondents' experiences, activities, and livelihoods in the preceding months. It also asked the respondent to recall the food groups consumed the day before (24-hour food recall) and the frequency in eating meat, fish, and vegetables in the week before the phone interview, as well as how these indicators changed compared to the year before the COVID-19 crisis (2019). Although all survey rounds asked about food consumption, we use only round 5 in this paper for two reasons: (1) round 5 has the same survey months as the baseline, which eliminates seasonality biases; and (2) round 5 was conducted after the complete series of SBCC interventions (ending in December 2020). Moreover, the main indicators of women's empowerment based on pro-WEAI (project-level women's empowerment in agriculture index) were tracked only in round 5 and not in the other survey rounds.

The sample at baseline was 918 households, while the phone survey round 5 included 382 households. Household attrition from baseline to the first round of the phone survey was 39 percent and was primarily driven by phone-related issues. At baseline, 7 percent of households did not have a mobile phone, and an additional 7 percent did not provide their telephone numbers during the baseline survey. Furthermore, 25 percent of telephone numbers were not working during the first round.[4] Additional attrition from the first to the fifth round occurred because of out-of-service telephone numbers, unanswered calls, and interview refusals. In total, household attrition was 62 percent from the baseline to the fifth round of the survey.

To address this high attrition related to the phone survey, we performed an attrition probit analysis by looking at variables that explain attrition or successful re-interviews (see annex table A1 for the attrition probit regression results). We then applied inverse probability weighting to attenuate attrition bias (i.e., we computed the inverse of the probability of the attrition probit (*1/pr*) and used it as attrition weight). This procedure gives more weight to households that have similar initial characteristics as households that subsequently dropped out than to households with characteristics that made them more likely to remain in the panel.

4.3 Outcome indicators

Women's empowerment

We used the pro-WEAI, a widely used measure of women's empowerment (see Malapit et al. 2019). We collected and report here pro-WEAI indicators for the primary male and female decision-makers within the household. At baseline, we collected all pro-WEAI indicators, with some modifications based on findings from pretesting and cognitive interviewing (see Lambrecht et al. 2020b). Table 1

[3] Community volunteers were recruited to mobilize the participants and lead the trainings using voice-recorded presentations and instructions (provided on memory sticks). Community volunteers were identified with the help of the village leaders and trained via phone by project facilitators. The materials sent to the community volunteers were manual books, pre-test and post-test evaluation forms, flip charts, and voice-recording files (memory stick)—all sent to the Express Car Gate in the village and collected by the volunteer before the training days. The training sessions were conducted according to the guidelines of the Ministry of Health and Sports (e.g., social distancing, providing masks and hand sanitizer, and regular hand washing). The audio files were opened with Bluetooth sound box that could be heard by more than 30 people. The volunteers sent the all the filled forms and flip chart to us after training.

[4] The government of Myanmar implemented a mandatory registration of SIM cards by June 30, 2020. This order likely led to a large share of phone numbers being blocked and users changing phone numbers (https://www.irrawaddy.com/news/burma/myanmar-mobile-users-told-re-register-sim-cards-june-30.html).

summarizes the pro-WEAI indicators, and annex table A2 briefly describes the measurements. In the follow-up phone survey in round 5, we did not collect data needed to construct all pro-WEAI indicators for three reasons. First, the phone-based nature of the survey limited our ability to effectively ask some types of questions. Second, we had to be selective on the questions that we asked in order to keep the survey to a short and manageable time (20–30 minutes). Third, we prioritized the indicators that could potentially change as a result of the COVID-19 crisis. We excluded questions related to indicators that we thought would not change due to the occurrence of COVID-19 throughout the project implementation period, were already very high at baseline, or were difficult to gather in a phone survey format: group membership, membership in influential groups, ownership of land and other assets, and autonomy in income (table 1).

Table 1. Proportion (%) of survey respondents achieving adequacy in different empowerment domains, by gender, pre- and post-intervention

	Pre-intervention			Post-intervention		
	Women	Men	Gender gap	Women	Men	Gender gap
Intrinsic agency						
Autonomy in income /a	89	91	2			
Self-efficacy	94	96	2*	96	99	3
Attitudes about intimate partner violence against women	8	19	11***	10	30	20***
Respect among household members	74	79	5**	83	82	1
Instrumental agency						
Input in productive decisions	89	98	9***	94	96	2
Ownership of land and other assets /b	99	100	0			
Access to and decisions on financial services	66	80	13***	63	75	12***
Control over use of income	84	83	-2	88	90	2
Work balance	72	80	8***	84	84	0
Collective agency						
Group membership /c	32	67	34***			
Membership in influential groups /c	31	64	33***			
N	929	848		382	298	

Source: IFPRI/ MSR household surveys, January-February 2020 and February-March 2021. Statistically different at *** 1%, ** 5%, and * 10% level of significance. The standard errors are clustered at village level; and post-intervention figures are adjusted with attrition weights; /a, /b and /c (those shaded) were included in the baseline but excluded in the follow-up phone survey because (a) they are difficult to implement in a phone survey format, (b) they are already very at baseline, and (c) we think would not change much due to the COVID-19, respectively.

Intrahousehold inequality and intrahousehold dynamics

In addition to comparing empowerment indicators between women and men, we defined indicators measuring intrahousehold inequality. Malapit et al. (2020) and Quisumbing et al. (2021a) measure intrahousehold inequality as the difference between women's and men's empowerment scores (a continuous variable, from −1 to 1). A positive inequality score means that men are more empowered than women in the household, whereas a negative inequality score means that women are more empowered than men in the household. If gender equality is a desired outcome, the interpretation of regression coefficients using a continuous intrahousehold inequality variable would be ambiguous. Malapit et al. and Quisumbing et al. construct a categorical variable defined as (1) whether the man is more empowered than the woman (W<M), (2) whether the woman is more empowered than the man (W>M), or (3) whether the man and woman achieve similar levels of empowerment or have gender parity (W=M). Following that concept, we constructed a similar categorical variable for each pro-WEAI indicator available for each year. The analysis in this paper focuses on minimizing the case in which women are less empowered than men (W<M) in reference or in comparison to that in

which women are at least as empowered as men (W>M or W=M), for each pro-WEAI indicator for each year. Data and analysis are presented in figure 5a and table 4.

We also looked at intrahousehold dynamics or the changes in the intrahousehold relation over time. We constructed another categorical variable that measures this intrahousehold dynamic from the baseline survey (2020) to the endline survey (2021):

- Whether the household experienced improvement in empowerment for either the woman or the man or both, and no decline for either, for each indicator
- Whether the household experienced worsened empowerment for either the woman or the man (even if it gets better for one of them) for each indicator
- Whether the household has the same empowerment for the woman or the man for each indicator

Data and analysis on this are presented in figure 5b and table 4.

Diet quality

The nutrition outcomes are measured by assessing women's dietary diversity. The 24-hour dietary recall questionnaire followed the good practice recommendations on food groupings highlighted in FAO and FHI360 (2016). The Minimum Dietary Diversity for Women (MDD-W) is an internationally validated proxy indicator for the probability of micronutrient adequacy such that a population of women aged 15–49 years is more likely to have achieved micronutrient adequacy if on average women aged 15–49 consumed at least 5 out of 10 healthy food groups in a 24-hour period (FAO and FHI360, 2016; Martin-Prével et al. 2015). We follow the 10 food groups used in MDD-W. There is no validated cutoff for other age groups. This study considers adult women primary decision-makers, including those above 49 years, so we report and analyze the score here. The specific women's dietary diversity outcomes monitored are (1) a dietary diversity score (DDS) measured by the number of healthy food groups consumed (0–10), and (2) consumption of each food group. Data and analysis on this are presented in figure 6 and table 5.

Concerns may be raised over potential systematic bias when comparing data from in-person interviews compared to phone survey interviews. While this cannot be ruled out, a study focusing on women's dietary diversity scores in Kenya found that women's diet diversity scores did not change according to modality of data collection (Lamanna et al. 2019).

4.4 Statistical analysis

Given random assignment to the treatment, intention-to-treat effects are estimated in regression models, where the variable of interest is the indicator variable equal to one if the village was assigned to the treatment group. The outcome can then be written as

$$Y_{1i} = \alpha_0 + \beta_{1,SD}T + \gamma_x X_{0i} + \varepsilon_{1i}$$

$$Y_{1i} = \alpha_0 + \beta_{1,A}T + \beta_y Y_{0i} + \gamma_x X_{0i} + \varepsilon_{1i},$$

where *Y* is the outcome indicator at time 0 (baseline) or time 1 (endline); *i* is the individual or household; *a* is the intercept; β_1 measures the average effects of the treatment *T*; *X* is a vector of control variables; and ε is the error term, which is clustered at the village level. We test the null hypothesis $\beta_1 = 0$. If rejected, we conclude that the treatment or intervention package has a significant effect with a magnitude of β_1.

Using the baseline data already collected, we tested for balance in the baseline characteristics. Annex tables A3 and A4 provide the results of the test for balance. All baseline characteristics are similar between treatment and control households; therefore, we proceed with confidence that a good baseline balance exists between treatment and control.

For the DDS, we performed a Poisson regression commonly used for count data (i.e., number of food groups consumed). As a robustness test, we also performed ordinary least squares mimicking a continuous outcome variable. For the dummy variables measuring likelihood of consumption of each of the 10 food groups, adequacy in empowerment for each indicator, intrahousehold inequality, and changes in intrahousehold relation, we performed probit models. We included various control variables, including demographic characteristics and shocks experienced during the COVID-19 crisis including self-reported household income loss, receipt of cash transfers, and borrowing money (see annex table A5 for a summary of control variables).

5. RESULTS

5.1 Women's empowerment and intrahousehold parity

At baseline, 53 percent of women, compared to 25 percent of men, did not achieve empowerment (Ragasa et al. 2020). Acceptance of intimate partner violence (IPV) against women and lack of participation in groups and in influential groups are the top contributors to disempowerment for women and men (table 1) (Ragasa et al. 2020). Forty-five percent of households did not achieve gender parity (i.e., the woman achieving empowerment or having the same or greater empowerment score than the man in the household) (Ragasa et al. 2020). The largest differences in adequacies between women and men were in indicators of collective agency, particularly group membership, with men more likely to achieve adequacy, and membership in influential groups (table 1, figures 4 and 5). The next-largest differences in adequacies between women and men were in indicators of instrumental agency, in particular, access to and decisions on financial services. The difference between men and women in inputs to productive decisions was also relatively large. Among the intrinsic agency indicators, attitudes about IPV against women show the largest difference in adequacy between women and men. Women were more tolerant and accepting than men of IPV (more details in table 2). Only 8 percent of women and 19 percent of men achieved adequacy in this indicator.

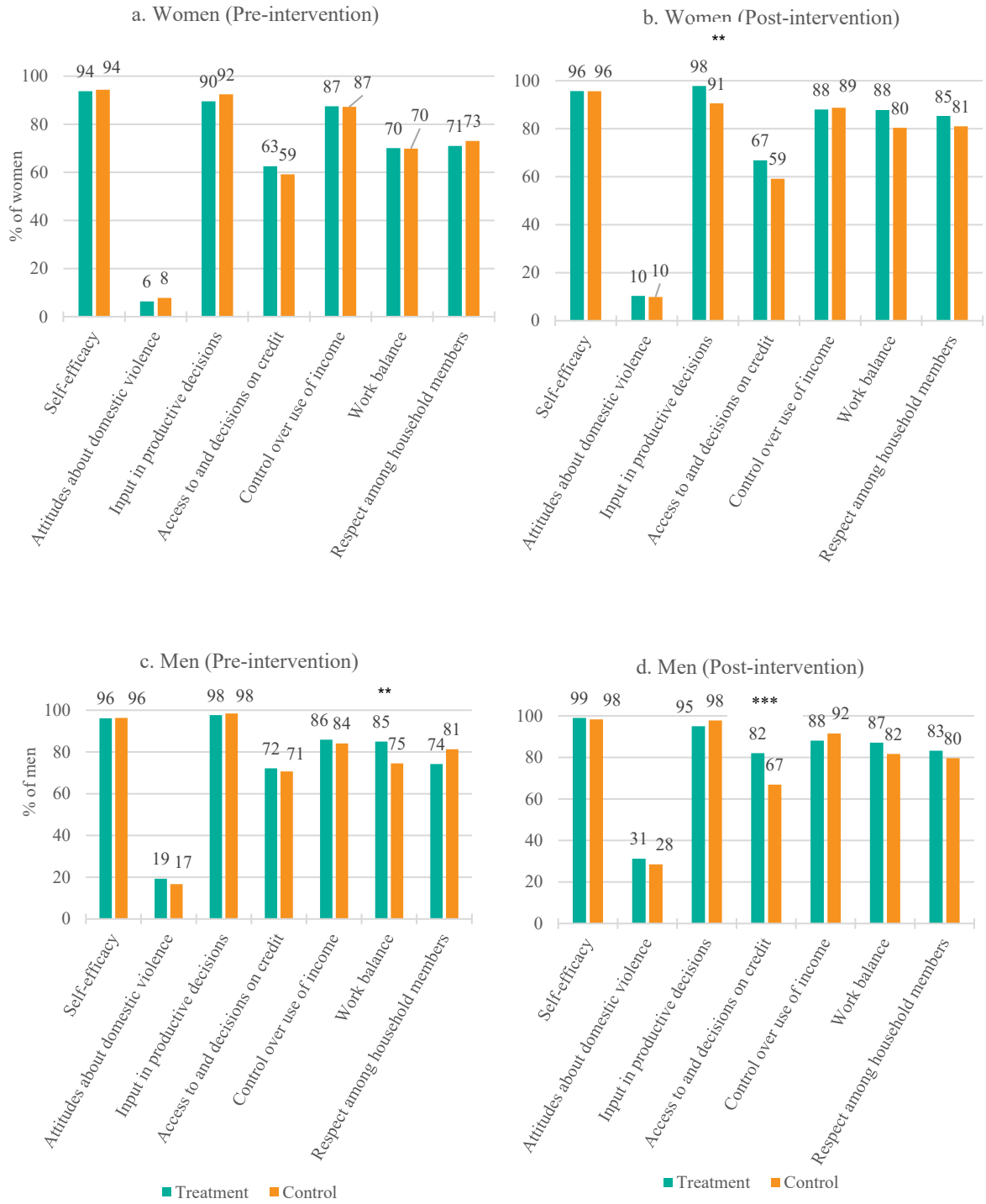
Results of the impact evaluation of the SBCC show improvement in several indicators of women's empowerment and intrahousehold parity tracked in the 2021 phone survey. Simple comparisons of pre- and post-intervention indicators show that significantly more women in treatment villages achieved adequacy in inputs to productive decisions and more men in the treatment villages achieved adequacy in access to and decisions over financial resources (figure 4). Other indicators are higher for women in the treatment villages than in the control villages—access to and decisions over financial resources, work balance, and respect among household members—although the differences were not significant after clustering and attrition weighting.

After controlling for demographics and lagged outcomes, more women in treatment villages achieved adequacy in input in productive decisions and access to and decisions over credit and other financial resources (table 3). More men in treatment villages achieved adequacy in access to and decisions over financial resources and work balance.

Adequacy in attitude toward IPV improved tremendously for women and men in 2021 (table 1). Although the aggregate indicator does not show significant differences between treatment and control villages, disaggregated data suggest substantial improvements in some aspects of this

indicator. Table 2 shows that fewer women and men were tolerant of IPV in 2021 than in 2020 and that fewer women and men in treatment villages than in control villages were tolerant of IPV in 2021.

Figure 4. Percentage of women and men achieving adequacy in the empowerment indicators, by treatment and control groups, and by pre- and post-intervention periods.



Source: IFPRI/MSR face-to-face household survey (Jan-Feb 2020); and IFPRI/MSR phone survey (Feb-Mar 2021).
Note: Statistical significance of the difference between control and treatment households at the 1%, 5%, and 10% levels is indicated with ***, **, and *, respectively, on the relevant empowerment indicator.

Table 2. Percentage of women and men respondents who agree that "A husband is justified in hitting/beating his wife in the following situations."

Situations	Women [/a]			Men [/a]			Women [/b]			Men [/b]	
	2020	2021		2020	2021		Treatment	Control		Treatment	Control
She goes out without telling him	51	45		32	29		42	49		25	34
She neglects the children	63	53	*	49	36	**	48	58		31	42
She burns the food	62	46	**	36	23	**	40	53		17	29
She argues with him	58	42	***	35	26		34	50	*	23	30
She is unfaithful	91	88		79	67	**	88	88		68	66
N	382	382		298	298		212	170		161	137

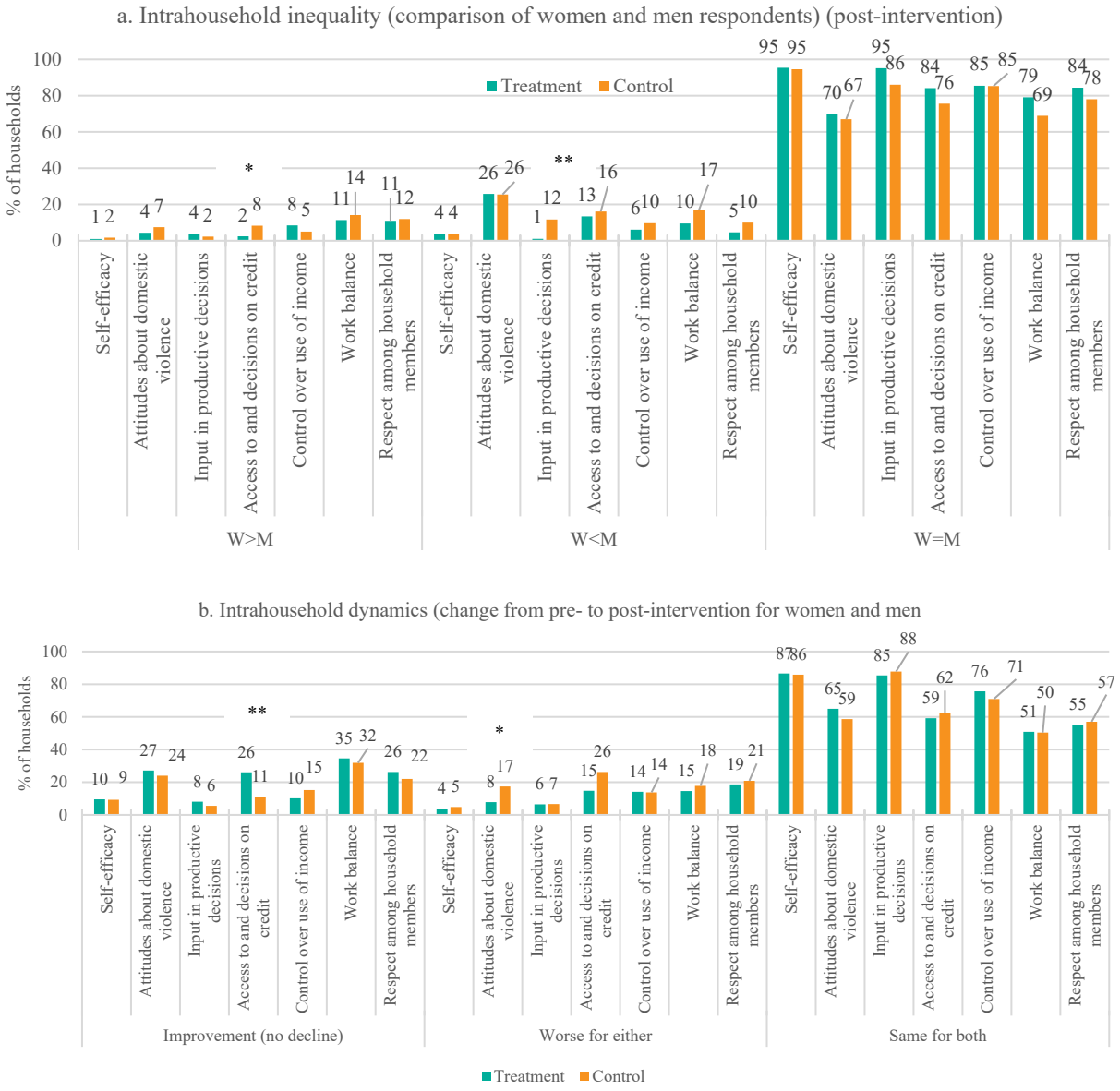
Source: IFPRI/MSR face-to-face household survey (Jan-Feb 2020); and IFPRI/MSR phone survey (Feb-Mar 2021).
Note: Statistical significance of the difference between 2020 and 2021 survey data ([/a]) and between control and treatment households (in 2021 survey, [/ba]) at the 1%, 5%, and 10% levels is indicated with ***, **, and *, respectively.

Figure 5 presents indicators of intrahousehold inequality and changes in intrahousehold relations. Figure 5a shows high intrahousehold parity (i.e., same score or adequacy for the interviewed woman and man within the household) in almost all of the indicators in 2021 (post-intervention), which mirrors similar outcomes in 2020 (pre-intervention). The only exception is in the adequacy in attitude toward IPV, which shows relatively high intrahousehold inequality, with women having lower adequacy than men (W<M). Comparing households in treatment and control villages shows no major difference except in inputs to productive decisions. We see significantly fewer households in treatment villages than in control villages having intrahousehold inequality (W<M) in inputs to productive decisions.

Figure 5b shows that most indicators have stayed the same before and after the intervention, with a few exceptions. Notable differences between treatment and control villages are in improvements in access to and decisions over financial resources and attitudes towards IPV. More households in treatment villages experienced improvements in access to and decisions over financial resources by women or men (no decline in either) than in control villages. We see fewer households in the treatment villages in which women or men achieved worse adequacy in 2021 in attitude toward IPV.

After controlling for demographic indicators, we see lower intrahousehold inequality (W<M) in adequacy in respect among household members and inputs to productive decisions among treatment households than in control households (table 4). In terms of adequacy in access to and decisions over credit in the treatment households, we see more households with improvement achieved by either women or men (and no decline in either) in 2021 than in 2020. We see fewer households among the treatment households in which women or men achieved worse outcomes in 2021 than in 2020 in adequacy in inputs to productive decisions, access to and decisions over credit, and attitude toward IPV.

Figure 5. Percentage of households by (a) intrahousehold inequality (b) and intrahousehold dynamics



Source: IFPRI/MSR face-to-face household survey (Jan-Feb 2020); and IFPRI/MSR phone survey (Feb-Mar 2021). W=woman; M=man within the household. Statistical significance of the difference between control and treatment households at the 1%, 5%, and 10% levels is indicated with ***, **, and *, respectively.

Table 3. Average treatment effect on women's and men's empowerment indicators

Outcome variables	Women				Men			
	Treatment effects (With controls, SD)	Treatment effects (With controls and lagged outcome, ANCOVA)	Control Mean	N	Treatment effects (With controls, SD)	Treatment effects (With controls and lagged outcome, ANCOVA)	Control Mean	N
Respect among household members	0.06	0.06	0.81	356	0.04	0.05	0.80	288
	(0.04)	(0.04)			(0.06)	(0.06)		
Self-efficacy	0.00	0.00	0.96	301	0.02	0.02	0.98	298
	(0.021)	(0.02)			(0.02)	(0.02)		
Attitudes about IPV	0.02	0.02	0.10	382	0.02	0.01	0.28	298
	(0.03)	(0.03)			(0.07)	(0.07)		
Input in productive decisions	0.09***	0.09***	0.91	312	0.06	0.01	0.98	295
	(0.04)	(0.03)			(0.04)	(0.05)		
Access to and decisions on credit	0.13**	0.14**	0.59	382	0.15***	0.15***	0.67	298
	(0.07)	(0.06)			(0.05)	(0.04)		
Control over use of income	0.04	0.05	0.89	346	-0.02	-0.02	0.92	282
	(0.04)	(0.04)			(0.04)	(0.04)		
Work balance	0.04	0.03	0.80	382	0.07*	0.06*	0.82	290
	(0.04)	(0.04)			(0.04)	(0.04)		

Source: IFPRI/MSR phone survey (February-March 2021). ANCOVA=analysis of covariance; SD=single difference.
Note: Statistical significance of coefficient estimates at the 1%, 5%, and 10% levels is indicated with ***, **, and *, respectively. All regressions use survey round fixed effects and clustering at village. Controls include baseline respondent characteristics (age, education level, and occupation, such as agricultural farmer, labor, or other jobs) and baseline household demographic characteristics (type of household, township, household size, dummy indicating household is a water user), and dummies indicating whether the household has income loss due to COVID-19, has accepted transfers from government or nongovernment organizations, and has borrowed money during the COVID-19 crisis.

Table 4. Average treatment effects of SBCC on indicators of intrahousehold inequality and dynamics

Outcome indicator in different models	Treatment effect (with controls, SD)	Treatment effect (with controls and lagged outcome, ANCOVA)	Control Mean	N
Respect among household members				
Household has intrahousehold inequality in this indicator (W<M) (reference point= [W = or > M])	-0.04** (0.02)	-0.04** (0.02)	0.10	294
Intrahousehold dynamics (reference point=W and M in the household have the same adequacy in this indicator)				
W or M in the household experienced improvement (no decline in either W or M) in in this indicator	0.03 (0.07)		0.22	294
W or M in the household experienced worsened adequacy in this indicator	-0.02 (0.05)		0.21	294
Self-efficacy				
Household has intrahousehold inequality in this indicator (W<M) (reference point= [W = or > M])	0.01 (0.02)	0.02 (0.02)	0.04	294
Intrahousehold dynamics (reference point=W and M in the household have the same adequacy in this indicator)				
W or M in the household experienced improvement (no decline in either W or M) in in this indicator	-0.01 (0.05)		0.09	294
W or M in the household experienced worsened adequacy in this indicator	0.00 (0.02)		0.05	294
Attitude towards IPV				
Household has intrahousehold inequality in this indicator (W<M) (reference point= [W = or > M])	-0.01 (0.06)	-0.02 (0.07)	0.26	294
Intrahousehold dynamics (reference point=W and M in the household have the same adequacy in this indicator)				
W or M in the household experienced improvement (no decline in either W or M) in in this indicator	-0.01 (0.07)		0.24	294
W or M in the household experienced worsened adequacy in this indicator	-0.07* (0.04)		0.17	294
Input to productive decisions				
Household has intrahousehold inequality in this indicator (W<M) (reference point= [W = or > M])	-0.15*** (0.052)	-0.13*** (0.040)	0.12	294
Intrahousehold dynamics (reference point=W and M in the household have the same adequacy in this indicator)				
W or M in the household experienced improvement (no decline in either W or M) in in this indicator	0.01 (0.029)		0.06	294
W or M in the household experienced worsened adequacy in this indicator	-0.06** (0.029)		0.07	294
Access to and decisions on financial resources				
Household has intrahousehold inequality in this indicator (W<M) (reference point= [W = or > M])	-0.00 (0.043)	-0.01 (0.041)	0.16	294
Intrahousehold dynamics (reference point=W and M in the household have the same adequacy in this indicator)				
W or M in the household experienced improvement (no decline in either W or M) in in this indicator	0.11*** (0.039)		0.11	294
W or M in the household experienced worsened adequacy in this indicator	-0.12* (0.066)		0.26	294
Control over income				
Household has intrahousehold inequality in this indicator (W<M) (reference point= [W = or > M])	-0.04 (0.039)	-0.05 (0.029)	0.10	294
Intrahousehold dynamics (reference point=W and M in the household have the same adequacy in this indicator)				
W or M in the household experienced improvement (no decline in either W or M) in in this indicator	-0.03 (0.040)		0.15	294
W or M in the household experienced worsened adequacy in this indicator	-0.03 (0.053)		0.14	294
Work balance				
Household has intrahousehold inequality in this indicator (W<M) (reference point= [W = or > M])	-0.02 (0.040)	-0.03 (0.040)	0.17	294
Intrahousehold dynamics (reference point=W and M in the household have the same adequacy in this indicator)				
W or M in the household experienced improvement (no decline in either W or M) in in this indicator	-0.01 (0.054)		0.32	294
W or M in the household experienced worsened adequacy in this indicator	-0.04 (0.048)		0.18	294

Source: IFPRI/MSR phone survey (February-March 2021). W=woman; M=man; ANCOVA=analysis of covariance; SD=single difference.
Note: Statistical significance of coefficient estimates at the 1%, 5%, and 10% levels is indicated with ***, **, and *, respectively. All regressions use survey round fixed effects and clustering at village. Controls include baseline respondent characteristics (age, education level, and occupation, such as agricultural farmer, labor, or other jobs) and baseline household demographic characteristics (type of household, township, household size, dummy indicating household is a water user), and dummies indicating whether the household has income loss due to COVID-19, has accepted transfers from government or nongovernment organizations, and has borrowed money during the COVID-19 crisis.

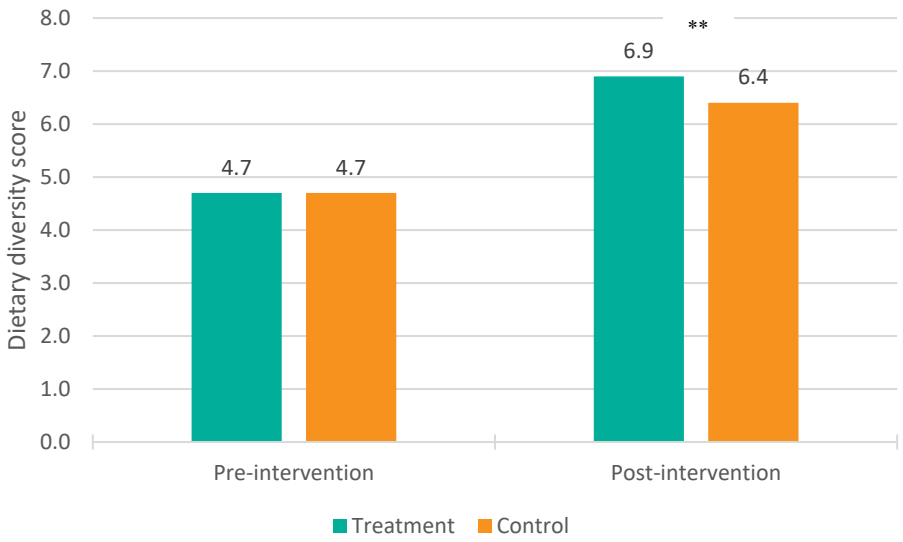
5.2 Dietary diversity

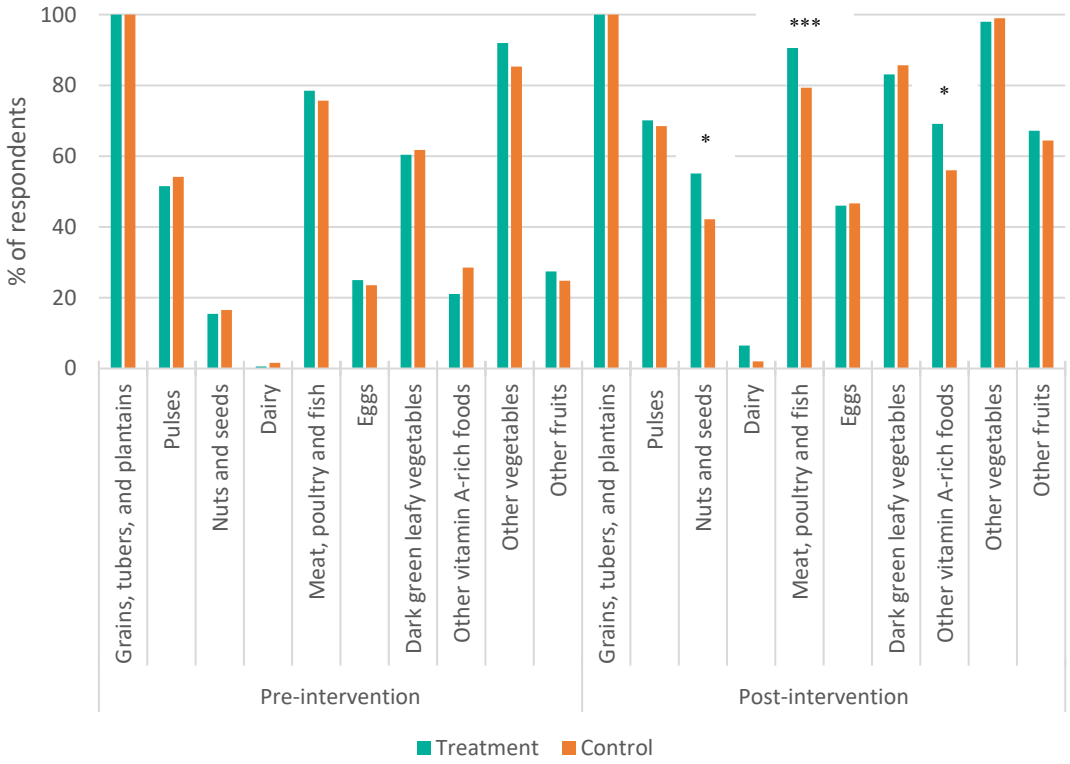
The baseline assessment of respondents' food consumption in the previous 24 hours found both men and women to be lacking the dietary diversity associated with healthy diets. Notably, the vast majority of respondents did not report consuming dairy or vitamin A–rich fruits and vegetables (Ragasa et al. 2020). Even when beans and nuts were seemingly available in the study areas, many households did not consume them on a daily basis. At baseline, 44 percent of women were likely to have consumed inadequately diverse diets (<5 out of 10 food groups) (Ragasa et al. 2020).

In a simple pre- and post-intervention comparison, figure 6a shows that the average women's DDS is higher in treatment villages than in the control villages as a result of the SBCC intervention. Figure 6 shows that more women in treatment villages were consuming nuts and seeds, meat and fish, and vitamin A–rich fruits and vegetables daily than women in control villages. After controlling for demographics and lagged outcome, we continue to see a positive average treatment effect of the SBCC intervention on measures of women's dietary diversity (table 5).

Participation in the intervention improves women decision-makers' DDS by about half a point (0.5 of 10 food groups) compared to women in control villages. This finding is similar to the midline estimate in Ragasa et al. (2021b) and is indicative of sustained positive impacts half a year after the SBCC intervention. More women in treatment villages were consuming nuts and seeds (11 percent more women), dairy (1 percent more women), meat and fish (10 percent more women), and vitamin A–rich fruits and vegetables (17–18 percent more women).

Figure 6. Women's dietary diversity score and consumption per food group, by pre- and post-intervention.





Source: IFPRI/MSR face-to-face household survey (Jan-Feb 2020); and IFPRI/MSR phone survey (Feb-Mar 2021). Statistical significance of the difference between control and treatment households at the 1%, 5%, and 10% levels is indicated with ***, **, and *, respectively.

Table 5. Average treatment effect on dietary outcome indicators

Main Outcomes	Treatment effect (with controls, SD)	Treatment effect (with controls and lagged outcome, ANCOVA)	Control group mean	Total number of observations
	(1)	(2)	(3)	(4)
Panel A: Poisson regression (marginal effect reported)				
Women's dietary diversity score (0 – 10) [/a]	0.54**	0.54**	6.44	382
	(0.23)	(0.23)		
Panel B: Probit regression (marginal effect reported)				
Food group consumption among women (= 1) [/c]				
Pulses	0.03	0.02	0.69	382
	(0.06)	(0.06)		
Nuts and seeds	0.11*	0.11*	0.42	382
	(0.06)	(0.07)		
Dairy	0.01**	0.01**	0.02	382
	(0.01)	(0.01)		
Meat/poultry/fish	0.10***	0.10***	0.79	382
	(0.03)	(0.03)		
Eggs	0.05	0.04	0.47	382
	(0.08)	(0.08)		
Dark green leafy vegs.	-0.02	-0.02	0.86	382
	(0.04)	(0.04)		
Vitamin A–rich fruits vegs.	0.17**	0.18**	0.56	382
	(0.07)	(0.07)		
Other fruits	0.08	0.08	0.64	382
	(0.08)	(0.09)		

Source: IFPRI/MSR phone survey (February-March 2021). Without attrition weights

Note: /a 10 MDD-W food groups; /b 10 MDD-W food groups; score < 5 indicates inadequate dietary diversity. /c We do not report the staple food group results because all respondents report consuming staples. ANCOVA=analysis of covariance; SD=single difference. Statistical significance of coefficient estimates at the 1%, 5%, and 10% levels is indicated with ***, **, and *, respectively. All regressions use survey round fixed effects and clustering at village. Controls include baseline head of household characteristics (age, education level, and occupation, such as agricultural farmer, labor, or other jobs) and baseline household demographic characteristics (type of household, township, household size, dummy indicating household is a water user), and dummies indicating whether the household has income loss due to COVID-19, has accepted transfers from government or nongovernment organizations, and has borrowed money during the COVID-19 crisis.

5.3 Association of women's empowerment and dietary diversity

In looking at the association between empowerment indicators and dietary diversity, we find few significant and consistent associations (table 6). What we find consistent across models is the strongly and consistently negative association between women's group membership and the likelihood of their having inadequate dietary diversity. This indicates that women's group membership is positively associated with their dietary diversity. There are other indicators that are significant but not consistent across models. Women's access to and decision on credit is positively associated with their DDS in some models only; we also find that having inadequate dietary diversity is negatively associated with inputs to productive decisions in some models only. We find a positive association between attitude toward IPV and the likelihood of women's inadequate dietary diversity in some models only. The latter is an unexpected result and may just be due to the small variation in the attitude towards IPV.

Table 6. Results of regression models exploring the association between WEAI components and women's dietary diversity indicators

Explanatory variables	(1) WDDS		(2) WDDS<5	
	No attrition weights	With attrition weights	No attrition weights	With attrition weights
Respect among household members	-0.05	0.04	0.01	0.01
	(0.15)	(0.20)	(0.01)	(0.01)
Attitudes toward IPV	-0.00	-0.36	0.04	0.11**
	(0.26)	(0.35)	(0.03)	(0.05)
Input in productive decisions	0.46	0.29	-0.07*	-0.06
	(0.40)	(0.58)	(0.04)	(0.05)
Access to and decisions on credit	0.27*	0.11	-0.01	-0.02
	(0.15)	(0.22)	(0.01)	(0.013)
Work balance	0.11	0.08	-0.01	-0.01
	(0.18)	(0.21)	(0.02)	(0.02)
Group membership (lagged) /a	-0.05	-0.22	-0.49***	-0.43***
	(0.51)	(0.66)	(0.02)	(0.02)
Membership to influential groups (lagged) /a	-0.12	0.04	0.99	0.98
	(0.56)	(0.69)	(0.00)	(0.00)
N	339	339	321	321
Control Mean	6.78	6.66	0.07	0.09
Pseudo R2			0.25	0.28

Source: IFPRI/MSR phone survey (February-March 2021).
Note: (1) WDDS=women's dietary diversity score based on 10 MDD-W food groups; and estimated using Poisson regression; (2) women's dietary diversity score < 5 indicates inadequate dietary diversity; estimated using probit model; /a Using baseline (2020) survey data. Other pro-WEAI indicators are not included due to lack of variation since vast majority of women already achieved adequacy in these indicators. Statistical significance of coefficient estimates at the 1%, 5%, and 10% levels is indicated with ***, **, and *, respectively. All regressions use analysis of covariance (ANCOVA) and clustering at village level. Controls include baseline head of household characteristics (age, education level, and occupation, such as agricultural farmer, labor, or other jobs) and baseline household demographic characteristics (type of household, township, household size, dummy indicating household is a water user), and dummies indicating whether the household has income loss due to COVID-19, has accepted transfers from government or nongovernment organizations, and has borrowed money during the COVID-19 crisis.

6. DISCUSSION

Knowing what works in mitigating negative impacts of a major shock such as the COVID-19 pandemic is critical for formulating responses to future shocks. We provide unique insights on the effectiveness of a nutrition and gender SBCC intervention in mitigating or improving dietary quality and women's empowerment during the first year of the pandemic. Our work contributes to the literature in four major ways. First, we offer a rigorous assessment of the impact of a gender and nutrition SBCC intervention only—that is, not in combination with other project activities and interventions. Second, we assess an intervention aimed to improve dietary quality and gender outcomes among all ages—as opposed to interventions focusing particularly on infant and young child feeding practices. Third, this paper is among the first to evaluate such an intervention taking place during the first year of the COVID-19 pandemic. Fourth, we evaluate a SBCC on combined gender and nutrition, and provide empirical evidence on the association of women's empowerment and dietary diversity.

The SBCC did have a significant impact on some aspects of women's empowerment and gender parity, though other components did not change. More women in treatment villages achieved adequacy in input in productive decisions and access to and decisions over credit and other financial resources. At the household level, we see significantly greater intrahousehold parity (lower inequality) in adequacy in respect among household members and inputs to productive decisions among treatment households than in control households. We see significantly more treatment households than control households with improvement achieved by either women or men (and no decline in either) in 2021 in adequacy in access to and decisions over credit. We see fewer households in the treatment villages in which women or men achieved worse in 2021 in terms of adequacy in inputs to productive decisions, access to and decisions over credit, and attitude toward IPV.

The effects of the SBCC on decision-making over productive activities and financial resources are perhaps the most straightforward and expected impacts, given that both men and women were also required to each (by telephone) or jointly (during household visits) participate in the training activities. Others unfortunately did not change to a significant extent. Attitudes toward IPV also saw some improvement, which is a laudable achievement—particular during stressful times such as a pandemic. Yet such attitudes still constitute the main sources of disempowerment of men and women—both in treatment and control groups, with 90 percent of women and 70 percent of men not achieving adequacy in this indicator in 2021. This indicator in particular would merit further efforts, preferably at a large scale, to improve attitudes in favor of nonviolence in the home.

Even in the presence of significant pressures to reduce consumption of more costly nutritious foods, women decision-makers in treatment villages had greater DDS and were more likely to consume some nutrient-dense foods (nuts and seeds, dairy, meat and fish, and vitamin A–rich fruits and vegetables) than those who did not receive the nutrition messaging. The treatment effect on the DDS was half a food group. This effect is of similar magnitude as that found by Ragasa et al. (2021b) at midline. Impacts of nutrition SBCC were thus maintained for several months which might indicate the success of the nutrition SBCC component as such or may have also been facilitated by the ensuing participant interactions through the gender SBCC component. The exploration of the link between women's empowerment and nutrition outcomes shows positive associations between the DDS and input into productive decisions and access to and decisions on financial resources, though not in all models. We find a strong association between women's group membership and their likelihood of having inadequate dietary diversity. Women who were member of groups are less likely to have inadequate dietary diversity.

Given the high emphasis during trainings on the importance of diverse diets, joint decision-making, and attitude toward IPV during trainings, it is plausible that the impacts observed consist of a real change in participants' attitudes. Yet a key limitation of this study is that we cannot exclude the possibility that responses are affected by social desirability bias. The findings would then be indicative of coaching messages being understood, though potentially not internalized, by respondents.

Interventions delivered via mobile devices are among the promising approaches recently being used in urban areas and locations with high mobile phone penetration (e.g., Ali et al. 2021 in India). However, in a review of 23 randomized controlled trials on healthy eating interventions delivered via mobile device, McCarroll, Eyles, and Ni Mhurchu (2017) find only small positive effects on healthy eating. In different settings such as in rural Myanmar, smartphones ownership and usage rates are lower, making mobile-based nutrition and gender messaging more challenging and requiring more flexible adaptations to reach all participants as intended—regardless of phone ownership and connectivity or access to social media.

By combining different delivery tools to reach different types of households and individuals, this study also illustrates how a nutrition and gender SBCC intervention can be effective during a crisis. In our study area, relying solely on mobile nutrition and gender messaging was not possible because of the lack of phone ownership or nonfunctional phone numbers for about 39 percent of the baseline survey households. Moreover, the functionality of some phones was insufficient to allow users to access flyers, pictures, videos, and interactive features of mobile messaging campaigns. Adaptations to more conventional SBCC techniques involved distributing materials directly to households and greater use of individual-level coaching, both in person and via phone, and introducing group- and voice-based training. We expect that some adaptations were more effective (e.g. household visits) than others (e.g. group of phone-based interactions), yet we could not test this in the framework of our experiment. Further research related to the effectiveness of different adaptations in this and other contexts is warranted.

To conclude, this study shows that SBCC delivered through a range of tools, including household visits, phone-based coaching, and voice-based training, that are responsive to local and individual resource limitations are plausible in the setting of a pandemic. Positive effects of the SBCC interventions were found on both dietary diversity and some indicators of women's empowerment. Gender messaging can change some gendered perceptions, particularly on more gender-equal decisions on farming, other livelihoods, and financial resources; but it may take some more time to change deeply ingrained gender norms, including around tolerance of IPV. Nutrition messaging can help counter the declines in dietary quality that would be expected from negative shocks to supply chains and incomes.

REFERENCES

Aguero, J.M. (2021). COVID-19 and the rise of intimate partner violence. World Development, 137: 105217.

Ahmed, A. U., J. Hoddinott, P. Menon, A. Quisumbing, S. Roy, and Younus, M. (2018). Agriculture, Nutrition, and Gender Linkages (ANGeL) Evaluation Results. Dhaka: International Food Policy Research Institute (IFPRI).

Ahmed, A., Hoddinott, J., and Roy, S (2019). Food transfers, cash transfers, behavior change communication and child nutrition. Evidence from Bangladesh. IFPRI Discussion Paper 01868. International Food Policy Research Institute, Washington, DC.

Akter, S. (2020). The impact of COVID-10 related 'stay-at-home' restrictions on food prices in Europe: findings from a preliminary analysis. Food Security, 12: 719-725.

Akter, S., Rutsaert, P., Luis, J., Htwe, N.M., San, S.S., Raharjo, B., and Pustika, A. (2017). Women's empowerment and gender equity in agriculture: A different perspective from Southeast Asia. Food Policy, 69: 270-279.

Ali, F., Paswan, S.K., Bennett, G., Pradhan, R., Nadagouda, S.B., and Choudhury, S.R. (2021). Leveraging digital platforms for disseminating health and nutrition information during COVID-19: reflections from Project Samvad in India. *Journal of Global Health Reports*, 5: e2021036. doi:10.29392/001c.22121

Blankenship, J.L., Cashin, J., Nguyen, T.T., and Ip, H. (2020). Childhood stunting and wasting in Myanmar: Key drivers and implications for policies and programmes. Maternal and Child Nutrition, 2020: 16(S2):e12710.

Boughton, D., Goeb, J., Lambrecht, I., Headey, D., Takeshima, H., Mahrt, K., Masias, I., Goudet, S., Ragasa, C., Maredia, M.K., Minten, B., and Diao, X. (2021). Impacts of COVID-19 on agricultural production and food systems in late transforming Southeast Asia: The case of Myanmar. Agricultural Systems 188: 103026.

Carnegie, M., Cornish, P.S., Htwe, K.K., and Htwe, N. N. (2020). Gender, decision-making and farm practice change: An action learning intervention in Myanmar. Journal of Rural Studies, 78: 503-515.

CSO (Central Statistical Organization), MoPFI (Ministry of Planning, Finance and Industry), & UNDP (United Nations Development Programme). (2020). Household Vulnerability Survey (HVS). Key Findings: Rapid assessment of the economic impact of COVID-19 restrictions on vulnerable households. Nay Pyi Taw, Myanmar.

Diao, X. and Mahrt, K. (2020). Assessing the impacts of COVID-19 on household incomes and poverty in Myanmar: A microsimulation approach. Myanmar SSP Working Paper 02. International Food Policy Research Institute, Washington, DC. https://doi.org/10.2499/p15738coll2.133859

DoP (Department of Population, Ministry of Labour, Immigration and Population) (2017). The 2014 Myanmar Population and Housing Census. Thematic Report on Education. Census Report Volume 4-H. Nay Pyi Taw, Myanmar.

FAO (Food and Agriculture Organization of the United Nations) and FHI 360. (2016). Minimum dietary diversity for women: A guide for measurement. FAO, Rome.

Farnworth, C. R., N. Sultana, P. Kantor, and Choudhury, A. (2015). Gender Integration in Aquaculture Research and Technology Adoption Processes: Lessons Learned in Bangladesh. Working Paper 2015–17, WorldFish, Penang.

Field, E., and Maffioli, E. (2021). Are Behavioral Change Interventions Needed to Make Cash Programs Work for Children: Experimental Evidence from Myanmar. NBER 28443.

Gender Equality Network (GEN). (2015). Raising the curtain. Cultural Norms, Social practices and Gender Equality in Myanmar. The Gender Equality Network, Yangon.

Goeb, J., Zone, P.P., Synt, N.L.K., Myint Zu, A., Tang, Y., and Minten, B. (2021). Food prices, processing, and shocks: Evidence from rice and COVID-19. Journal of Agricultural Economics, 00: 1-18.

Goeb, J., Maredia, M., Win, K.Z., Masias, I., Lambrecht, I., Boughton, D., and Minten, B. (2022). Urban food prices under lockdown: Evidence from Myanmar's traditional food retail sector during COVID-19. Applied Economics.

Gupta, A., Zhu, H., Doan, M.K., Michuda, A., and Majumder, B. (2021). Economic Impacts of the COVID-19 Lockdown in a Remittance-Dependent Region. American Journal of Agricultural Economics, 103(2): 466-485.

Headey, D., Goudet, S., Lambrecht, I., Oo, T.Z., Maffioli, M., Russell, T. (2022). Poverty and food insecurity during COVID-19: Panel phone survey evidence from rural and urban Myanmar in 2020. Global Food Security 33: 100626.

Hoddinott, J., Ahmed, A., Karachiwalla, N.I., and Roy, S. (2018). Nutrition behavior change communication causes sustained effects on IYCN knowledge in two cluster-randomised trials in Bangladesh. Maternal & Child Nutrition, 14: e12498.

Hong, S.A., Peltzer, K., Lwin, K.T., and Aung, L.S. (2018). The prevalence of underweight, overweight and obesity and their related socio-demographic and lifestyle factors among adult women in Myanmar, 2015-16. PlosONE. 13(3): e0194454.

Kansiime, M.K., Tambo, J.T., Mugambi, I., Bundi, M., Kara, A., and Owuor, C. (2021). COVID-19 implications on household income and food security in Kenya and Uganda: Findings from a rapid assessment. World Development 137: 105199.

Karimli, L, Lecoutere, E., Wells, C.R., and Ismayilova, L. (2021). More assets, more decisino-making power? Mediation model in a cluster-randomized controlled trial evaluating the effect of the graduation program on women's empowerment in Burkina Faso. World Development 137, 105159.

Kumar, N., Nguyen, P.H., Harris, J., Harvey, D., Rawat, R., and Ruel, M.T. (2018). What it takes: evidence from a nutrition – and gender-sensitive agriculture intervention in rural Zambia. Journal of Development Effectiviness 10(3): 341-372.

Lamanna, C., Hachhethu, K., Chesterman, S., Singhal, G., Mwongela, B., Ng'endo, M. et al. (2019). Strengths and limitations of computer assisted telephone interviews (CATI) for nutrition data collection in rural Kenya. PLoS ONE 14(1): e0210050.

Lambrecht, I., and Mahrt, K. (2019). Gender and assets in rural Myanmar: A cautionary tale for the analyst. IFPRI Discussion Paper 1894. International Food Policy Research Institute.

Lambrecht, I., Mahrt, K., and Cho, A. (2021). Women and youth in Myanmar agriculture. IFPRI Discussion Paper 2071. International Food Policy Research Institute.

Lambrecht, I., Ragasa, C., Mahrt, K., Aung, Z.W., Win, H.E., Zu, A.M. and Wang, M. (2020a). Monitoring the impact of COVID-19 in Myanmar. Agricultural production and rural livelihoods in two irrigation schemes – October 2020 survey round. Myanmar Stratey Support Program Policy Note 36. International Food Policy Research Institute.

Lambrecht, I., Sproule, K., Synt, N.L.K., Win, H.E., and Win, K.Z. (2020b). Project-level Women's Empowerment in Agriculture. Results from Cognitive Testing in Myanmar. IFPRI Discussion Paper 01945. International Food Policy Research Institute.

LEARN (Leveraging Essential Nutrition Actions to Reduce Malnutrition) (2015). *Learning about nutrition: A facilitator's guide for food security & livelihoods field agents.* Yangon, Myanmar. https://myanmar.savethechildren.net/sites/myanmar.savethechildren.net/files/library/LEARN%20Facilitator%27s%20Guide_2015_1.pdf.

Little, M.T., Roelen, K., Lange, B.C.L., Steinert, J.I., Yakubovich, A.R., Cluver, L., and Humphreys, D.K. (2021). Effectiveness of cash-plus programmes on early childhood outcomes compared to cash transfers alone: A systematic review and meta-analysis in low- and middle-income countries. PLOS Medicine 18(9): e1003698.

Mahrt, K., Mather, D., Herforth, A., and Headey, D. (2019). Household dietary patterns and the cost of a nutritious diet in Myanmar. IFPRI Discussion Paper 1854. Washington, DC: International Food Policy Research Institute (IFPRI).

Malapit, H., Quisumbing, A., Meinzen-Dick, R., Seymour, G., Martinez, E., Heckert, J., Rubin, D., Vaz, A., Yount, K., Gender, Agriculture, and Assets Project (GAAP) Phase II. (2019). "Development of the Project-Level Women's Empowerment in Agriculture Index (pro-WEAI)." *World Development* 122: 675–92.

Malapit, H., Ragasa, C., Martinez, E.M., Rubin, D., Seymour, G., and Quisumbing, A. (2020). Empowerment in agricultural value chains: Mixed methods evidence from the Phillippines. Journal of Rural Studies, 76: 240-253.

Margolies, A., Kemp, C.G., Choo, E.M., Levin, C., Olney, D., Kumar, N., Go, A., Alderman, H., and Gelli, A. (2022). Nutrition-sensitive agriculture programs increase dietary diversity in children under 5 years: A review and meta-analysis. Journal of Global Health, 12: 08001.

Martin-Prével, Y., Allemand, P., Wiesmann, D., Arimond, M., Ballard, T., Deitchler, M., Dop, M.C., Kennedy, G., Lee, W.T., and Mousi, M. (2015). Moving forward on choosing a standard operational indicator of women's dietary diversity. Food and Agriculture Organization of the United Nations, Rome.

McCarroll, R., Eyles, H., and Ni Mhurchu, C. (2017). Effectiveness of mobile health (mHealth) interventions for promoting healthy eating in adults: A systematic review. Preventive Medicine, 105, 156–168. https://doi.org/10.1016/j.ypmed.2017.08.022

Menon, P., Ruel, M.T., Nguyen, P.H., Kim, S.S., Lapping, K., Frongillo, E.A., and Alayon, S. (2020). Lessons from using cluster-randomized evaluations to build evidence on large-scale nutrition behavior change interventions. World Development, 127: 104816.

MoHS/Myanmar and ICF (2017). Myanmar Demographic and Health Survey 2015-16. Nay Pyi Taw, Myanmar: MoHS and ICF.

Narayanan, S. and Saha, S. (2021). Urban food markets and the COVID-19 lockdown in India. Global Food Security, 29: 100515.

Nakamura, M., Shirai, Y., and Sakuma, M. (2021). Dietary Changes during the COVID-19 Pandemic: A Longitudinal Study Using Objective Sequential Diet Records from an Electronic Purchase System in A Workplace Cafetaria in Japan. Nutrients, 13(5): 1606.

Niles, M.T., Wirkkala, K.B., Belarmino, E.H., and Bertmann, F. (2021). Home food procurement impacts food security and diet quality during COVID-19. BMC Public Health 21: 945.

Oo, T.Z., Minten, B., Headey, D., Lambrecht, I., and Goudet, S. (2020). Monitoring the impacts of COVID-19 in Myanmar. Food vendors – November 2020 survey round. Myanmar Strategy Support Policy Note 40. https://doi.org/10.2499/p15738coll2.134201

Quisumbing, A., Ahmed, A., Hoddinott, J., Pereira, A., and Roy, S. (2021a). Designing for empowerment impact in agricultural development projects: Experimental evidence from the Agriculture, Nutrition, and Gender Linkages (ANGeL) project in Bangladesh. World Development 146: 105622.

Quisumbing, A., K. Sproule, E. Martinez, and Malapit, H. (2021b). Do tradeoffs among dimensions of women's empowerment and nutrition outcomes exist? Evidence from six countries in Africa and Asia. Food Policy 102001.

Ragasa, C., Mahrt, K., Aung, Z. W., Lambrecht, I., and Scott, J. (2020). Gender, crop diversification, and nutrition in irrigation catchment areas in the central dry zones in Myanmar: Implications for agricultural development support. International Food Policy Research Institute. https://doi.org/10.2499/p15738coll2.133802.

Ragasa, C., Lambrecht, I., Mahrt, K., Aung, Z.W., and Wang, M. (2021a). Immediate impacts of COVID-19 on female and male farmers in central Myanmar: Phone-based household survey evidence. Agricultural Economics, 52(3): 505-23.

Ragasa, C., Lambrecht, I., Mahrt, K., Hongdi, Z., Aung, Z.W., and Scott, J. (2021b). Can nutrition education mitigate the impacts of COVID-19 on dietary quality? Cluster-randomised controlled trial evidence in Myanmar's Central Dry Zone. Maternal & Child nutrition 17(4): e13259.

Rahman, T., Hasnain, M.D.G., and Islam, A. (2021). Food insecurity and mental health of women during COVID-19: Evidence from a developing country. PlosONE 16(7): e0255392. https://doi.org/10.1371/journal.pone.0255392

Rosenberg, A.M., Maluccio, J.A., Harris, J., Mwanamwenge, M., Nguyen, P.H., Tembo, G., and Rawat, R. (2018). Nutrition-sensitive agricultural interventions, agricultural diversity, food access and child dietary diversity: Evidence from rural Zambia, Food Policy, 80: 10-23.

Roy, S., Hidrobo, M., Hoddinott, J., and Ahmed, A. (2019). Transfers, Behavior Change Communication, and Intimate Partner Violence: Postprogram Evidence from Rural Bangladesh. The Review of Economics and Statistics, 101(5): 865-877.

Ruan, J., Cai, Q., and Jin, S. (2021). COVID-19 and Vegetable prices in China. American Journal of Agricultural Economics, 103(5): 1574-1594.

Ruel, M.T., Quisumbing, A.R., and Balagamwala, M. (2018). Nutrition-sensitive agriculture: What have we learned so far? Global Food Security 17: 128-153.

Santoso, M.V., Kerr, R.B., Hoddinott, J., Garigipati, P., Olmost, S., and Young, S.L. (2019). Role of Women's Empowerment in child Nutrition Outcomes: A Systematic Review. Advanced in Nutrition, 10(6): 1138-1151.

UNDP (United Nations Development Programme) (2019). Human Development Report 2019: Beyond income, beyond averages, beyond today – inequalities in human development in the 21st century. New York: United Nations.

Winterberger, G. (2017). The Point of View Makes the Difference. Explaining the Position of Women in Myanmar. Asiatische Studien/Etudes Asiatiques, 71(1): 433-448.

World Bank. (2012). World Development Report 2012: Gender Equality and Development. World Bank; Washington, D.C.

World Health Organization (2021). COVID-19 Dashboard. Accessed online at [https://covid19.who.int/region/searo/country/mm] on March 20, 2022.

ACKNOWLEDGEMENTS

This work was undertaken as part of the Myanmar Agricultural Policy Support Activity (MAPSA) led by the International Food Policy Research Institute (IFPRI) in partnership with Michigan State University (MSU). Funding support for this study was provided by the CGIAR Research Program on Policies, Institutions, and Markets (PIM), the United States Agency of International Development (USAID), and the Livelihoods and Food Security Fund (LIFT). We thank MIGS for the skillful implementation and flexible adaptations of the SBCC interventions under difficult circumstances, and Myanmar Survey Research (MSR) for collecting the survey data. This Policy Note has not gone through IFPRI's standard peer-review procedure. The opinions expressed here belong to the authors, and do not necessarily reflect those of IFPRI, MSU, USAID, LIFT, or CGIAR.

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
1201 Eye St, NW | Washington, DC 20005 USA
T. +1-202-862-5600 | F. +1-202-862-5606
ifpri@cgiar.org
www.ifpri.org | www.ifpri.info

IFPRI-MYANMAR
IFPRI-Myanmar@cgiar.org
www.myanmar.ifpri.info

The Myanmar Strategy Support Program (Myanmar SSP) is led by the International Food Policy Research Institute (IFPRI) in partnership with Michigan State University (MSU). Funding support for Myanmar SSP is provided by the CGIAR Research Program on Policies, Institutions, and Markets; the Livelihoods and Food Security Fund (LIFT); and the United States Agency for International Development (USAID). This publication has been prepared as an output of Myanmar SSP. It has not been independently peer reviewed. Any opinions expressed here belong to the author(s) and do not necessarily reflect those of IFPRI, MSU, LIFT, USAID, or CGIAR.