FEED THE FUTURE

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

Feed the Future BANGLADESH 2018/2019

Zone of Influence Survey Endline Assessment

April 2013 – December 2020

USAID

FROM THE AMERICAN PEOPLE

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USAID Bureau for Resilience and Food Security Contact:
rfs.ald@usaid.gov

Photo Caption (Cover Page): A man and woman work in a crop field in Bangladesh. Photo Credit: AWM/Shutterstock.

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LIST OF ABBREVIATIONS

5DE	Five Domains of Empowerment
AEA	Agricultural extension agent
ANGeL	Agriculture, Nutrition, and Gender Linkages
A-WEAI	Abbreviated Women's Empowerment in Agriculture Index
BBS	Bangladesh Bureau of Statistics
BDHS	Bangladesh Demographic and Health Survey
BIHS	Bangladesh Integrated Household Survey
BMI	Body Mass Index
BNPI	Basic Needs Price Index
CI	Confidence interval
CPI	Consumer Price Index
DATA	Data Analysis and Technical Assistance
DEFF	Design effect
FANTA	Food and Nutrition Technical Assistance
GFSS	Global Food Security Strategy
GPI	Gender Parity Index
HIES	Household Income and Expenditure Survey
HYV	High yielding variety
ICC	Intercluster correlation coefficient
IFPRI	International Food Policy Research Institute
LCU	Local currency unit
LSMS	Living Standards Measurement Study
MAD	Minimum Acceptable Diet
MDD	Minimum Dietary Diversity
MT	Metric ton
NGO	Non-governmental organization
PII	Personally identifiable information
PPP	Purchasing power parity
PSU	Primary sampling unit
RFS	Bureau for Resilience and Food Security
SD	Standard deviation
SDI	Simpson Diversity Index

USAID	United States Agency for International Development
WDDS	Women's Dietary Diversity Score
WEAI	Women's Empowerment in Agriculture Index
WHO	World Health Organization
ZOI	Zone of Influence

EXECUTIVE SUMMARY

Background

Feed the Future seeks to sustainably reduce global poverty, hunger, and malnutrition by helping partner countries boost agriculture-led growth, resilience, and nutrition. Program efforts are designed to impact the population in Zones of Influence (ZOI) in Feed the Future target countries. Progress in achieving Feed the Future's objectives is tracked using population-based performance indicators collected at baseline then periodically thereafter.

The International Food Policy Research Institute (IFPRI) produced this report for the United States Agency for International Development (USAID) Bureau for Resilience and Food Security (RFS), USAID/Bangladesh, the Government of Bangladesh, and development partners. The report compares indicator estimates and select demographic and household characteristics from the 2018/2019 ZOI Survey, which serves as the Feed the Future Phase One endline survey, with the baseline assessment conducted in 2011/2012 in Bangladesh.[1] This report only includes the Feed the Future Phase One indicators.[2] Secondary data sources are used when needed or appropriate.

The Feed the Future Phase One ZOI in Bangladesh includes mostly rural areas in 20 districts consisting of 120 upazilas (sub-districts) in three divisions in the south and southwest region of the country.

This assessment provides information about progress on Feed the Future Phase One ZOI indicators. The assessment is designed to show changes in key indicator estimates from the Feed the Future Phase One baseline assessment to the endline assessment. The Feed the Future ZOI Survey endline assessment, however, was not designed to support conclusions of causality or program attribution.

Feed the Future Bangladesh Phase One ZOI Survey endline assessment indicators

The Feed the Future Phase One ZOI indicators included in this assessment are as follows:

1. Daily per capita expenditures (2010 USD)
2. Prevalence of poverty: Percentage of people living on less than $1.25/day 2005 purchasing power parity (PPP)[3]
3. Depth of poverty: Mean percent shortfall, relative to the $1.25/day 2005 PPP poverty line
4. Abbreviated Women's Empowerment in Agriculture Index (A-WEAI)[4]

[1] Baseline data from the secondary data sources—the Household Income and Expenditure Survey (HIES) and the Bangladesh Demographic and Health Survey (BDHS)—were not collected at the same time as the ZOI 2011/2012 baseline survey data. As outlined in Table ES2 and Table 2.1.1, baseline data from HIES were collected from February 2010-January 2011, the BDHS data were collected from July-December 2011, and the ZOI survey data were collected from October 2011-March 2012.

[2] Data for measuring the prevalence of anemia among women of reproductive age and the prevalence of anemia among children 6-59 months of age were not collected as part of the Feed the Future Bangladesh ZOI Survey 2018/2019 and, therefore, are not included in this assessment.

[3] All references to 'dollars' or '$' in this report refer to US dollars.

[4] IFPRI collected the full Women's Empowerment in Agriculture Index (WEAI) at baseline and endline. Per

5. Prevalence of moderate and severe hunger
6. Women's dietary diversity score: Mean number of food groups consumed by women of reproductive age (15-49)
7. Prevalence of exclusive breastfeeding of children under 6 months of age
8. Prevalence of children 6-23 months of age receiving a minimum acceptable diet
9. Prevalence of underweight women of reproductive age (15-49)
10. Prevalence of stunted children under 5 years of age
11. Prevalence of wasted children under 5 years of age
12. Prevalence of underweight children under 5 years of age

These 12 performance indicators at the goal level measure hunger, malnutrition, poverty, and empowerment among the population in the Bangladesh Feed the Future Phase One ZOI. Indicator estimates—in total and by key disaggregates—at Phase One baseline and at endline are presented in **Table ES1.** The unweighted number of observations, the difference between the baseline and endline estimates, the 95 percent confidence interval around the difference, the p-value associated with the difference, and the p-value's level of significance are also presented.

USAID's guidance, IFPRI reported an abbreviated version of the WEAI (A-WEAI) for the baseline and endline in this report to enable the assessment of change over Phase One of Feed the Future, as the A-WEAI had not yet been developed when the ZOI baseline report was produced in April 2013.

Table ES1: Feed the Future Phase One ZOI Indicator Estimates, by Key Disaggregates: Bangladesh

Indicator	Baseline			Endline				p-value[b]	Sig.[c]
	Est.	95% CI	n[a]	Est.	95% CI	n[a]	Diff.		
Mean daily per capita consumption expenditure in constant 2010 USD (2005 PPP)									
All households	1.78	1.72 – 1.84	2,040	2.07	2.01 – 2.14	2,064	0.29	0.000	***
Gendered household type									
Male and female adults	1.76	1.70 – 1.83	1,751	2.04	1.98 – 2.11	1,738	0.28	0.000	***
Female adults only	1.95	1.75 – 2.15	283	2.27	2.11 – 2.43	313	0.32	0.015	*
Male adults only	^	^	6	^	^	12	^	^	^
Children only	^	^	0	^	^	1	^	^	^
Prevalence of poverty: Percentage of people living on less than $1.25/day (2005 PPP)									
All households	40.6	37.1 – 44.0	2,040	25.2	22.3 – 28.1	2,064	-15.4	0.000	***
Gendered household type									
Male and female adults	40.5	36.9 – 44.1	1,751	25.5	22.4 – 28.5	1,738	-15.1	0.000	***
Female adults only	41.2	32.7 – 49.8	283	23.7	19.2 – 28.3	313	-17.5	0.000	***
Male adults only	^	^	6	^	^	12	^	^	^
Children only	^	^	0	^	^	1	^	^	^
Depth of poverty: Mean percent shortfall relative to the $1.25/day poverty line (2005 PPP)									
All households	9.3	8.3 – 10.2	2,040	4.6	3.8 – 5.3	2,064	-4.7	0.000	***
Gendered household type									
Male and female adults	9.2	8.2 – 10.2	1,751	4.6	3.8 – 5.4	1,738	-4.6	0.000	***
Female adults only	10.5	7.7 – 13.2	283	4.6	3.4 – 5.9	313	-5.8	0.000	***
Male adults only	^	^	6	^	^	12	^	^	^
Children only	^	^	0	^	^	1	^	^	^
Abbreviated Women's Empowerment in Agriculture Index[d]									
All women	0.68	0.66 – 0.70	1,850	0.89	0.88 – 0.90	1,831	0.21	0.000	***
Woman's age									
18-29 years	0.62	0.58 – 0.66	508	0.87	0.85 – 0.90	323	0.25	0.000	***
30 years or older	0.70	0.68 – 0.73	1,342	0.90	0.88 – 0.91	1,508	0.19	0.000	***
Prevalence of moderate and severe hunger									
All households	7.9	6.4 – 9.4	2,040	2.5	1.7 – 3.3	2,064	-5.4	0.000	***
Gendered household type									
Male and female adults	7.1	5.7 – 8.6	1,751	2.1	1.3 – 2.8	1,738	-5.0	0.000	***
Female adults only	12.9	8.4 – 17.5	283	4.5	2.3 – 6.7	313	-8.5	0.001	***
Male adults only	^	^	6	^	^	12	^	^	^
Children only	^	^	0	^	^	1	^	^	^
Women's dietary diversity: Mean number of food groups consumed by women of reproductive age[e]									
All women 15-49 years of age	4.4	4.3 – 4.4	2,125	4.9	4.8 – 5.0	2,151	0.6	0.000	***
Prevalence of exclusive breastfeeding among children under 6 months of age[e]									
All children	64.8	56.1 – 73.4	194	52.7	44.9 – 60.5	236	-12.1	0.040	*
Child's sex									

Indicator	Baseline			Endline			Diff.	p-value[b]	Sig.[c]
	Est.	95% CI	n[a]	Est.	95% CI	n[a]			
Male	58.9	46.1 – 71.8	101	50.5	40.7 – 60.2	135	-8.5	0.296	n/s
Female	71.1	61.2 – 81.0	93	55.5	44.6 – 66.5	101	-15.6	0.044	*
Prevalence of children 6-23 months of age receiving a minimum acceptable diet[e]									
All children	25.1	20.9 – 29.3	533	35.2	31.2 – 39.1	537	10	0.001	**
Child's sex									
Male	22.2	16.3 – 28.1	264	33.9	27.9 – 39.9	265	11.7	0.010	*
Female	27.9	21.7 – 34.1	269	36.3	29.4 – 43.2	272	8.5	0.069	n/s
Prevalence of underweight women of reproductive age[e]									
All non-pregnant women 15-49 years of age	22.2	20.3 – 24.1	4,327	11.0	9.6 – 12.3	4,627	-11.3	0.000	***
Prevalence of stunted children under 5 years of age[e]									
All children	38.6	35.8 – 41.5	1,797	27.0	24.1 – 30.0	1,769	-11.6	0.000	***
Child's sex									
Male	37.6	34.0 – 41.2	907	25.6	22.0 – 29.1	913	-12.1	0.000	***
Female	39.7	35.3 – 44.0	890	28.6	24.2 – 33.0	856	-11.1	0.000	***
Prevalence of wasted children under 5 years of age[e]									
All children	14.2	12.1 – 16.2	1,797	7.4	6.0 – 8.8	1,763	-6.8	0.000	***
Child's sex									
Male	14.7	11.5 – 17.9	907	7.8	6.0 – 9.7	908	-6.9	0.000	***
Female	13.7	11.3 – 16.0	890	7.0	4.9 – 9.0	855	-6.7	0.000	***
Prevalence of underweight children under 5 years of age[e]									
All children	32.3	29.4 – 35.2	1,797	17.5	15.2 – 19.7	1,797	-14.8	0.000	***
Child's sex									
Male	30.3	26.8 – 33.9	907	16.0	13.4 – 18.7	930	-14.3	0.000	***
Female	34.3	29.9 – 38.7	890	19.0	15.5 – 22.5	867	-15.3	0.000	***

Est.=estimate; CI=confidence interval; Diff.=difference

^ Results not statistically reliable, n<30

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[d] Originally, the Women's Empowerment in Agriculture Index (WEAI) was calculated at baseline. However, abbreviated WEAI (A-WEAI) was computed from 2011/2012 baseline data and reported so that endline-baseline comparisons could be made.

[e] Estimates are based on de facto household members.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members (i.e., gendered household type, woman's age, and child's sex) are calculated using de jure household members.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019; Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Feed the Future Bangladesh Phase One ZOI Survey endline assessment secondary data sources

Data for the Phase One ZOI indicators presented in this assessment are drawn from two secondary data sources in addition to the Phase One baseline and endline ZOI surveys. **Table ES2** summarizes, by indicator, the secondary data sources used and the dates of data collection for each.

Table ES2: Feed the Future Phase One ZOI Survey Endline Assessment Secondary Data Sources

Indicator	Secondary data source	Dates of data collection*
Baseline		
Prevalence of poverty: Percent of people living below the national extreme threshold of poverty	HIES 2010	Feb 2010-Jan 2011
Depth of poverty: Mean percent shortfall relative to the national extreme threshold of poverty	HIES 2010	Feb 2010-Jan 2011
Average consumption shortfall of the poor: Mean percent shortfall and mean shortfall in USD (2005 PPP) of the poor relative to the national extreme threshold of poverty	HIES 2010	Feb 2010-Jan 2011
Prevalence of poverty: Percent of people living below the national threshold of poverty	HIES 2010	Feb 2010-Jan 2011
Depth of poverty: Mean percent shortfall relative to the national threshold of poverty	HIES 2010	Feb 2010-Jan 2011
Average consumption shortfall of the poor: Mean percent shortfall and mean shortfall in USD (2005 PPP) of the poor relative to the national threshold of poverty	HIES 2010	Feb 2010-Jan 2011
Prevalence of exclusive breastfeeding among children under 6 months of age	BDHS 2011	July-Dec 2011
Prevalence of children 6-23 months receiving a minimum acceptable diet	BDHS 2011	July-Dec 2011
Components of a minimum acceptable diet among children age 6-23 months	BDHS 2011	July-Dec 2011
Prevalence of underweight women of reproductive age	BDHS 2011	July-Dec 2011
Prevalence of stunted children under 5 years of age	BDHS 2011	July-Dec 2011
Prevalence of wasted children under 5 years of age	BDHS 2011	July-Dec 2011
Prevalence of underweight children under 5 years of age	BDHS 2011	July-Dec 2011
Endline		
Prevalence of poverty: Percent of people living below the National Extreme Threshold of Poverty	HIES 2016	April 2016-March 2017
Depth of poverty: Mean percent shortfall relative to the national extreme threshold of poverty	HIES 2016	April 2016-March 2017
Average consumption shortfall of the poor: Mean percent shortfall and mean shortfall in USD (2005 PPP) of the poor relative to the national extreme threshold of poverty	HIES 2016	April 2016-March 2017
Prevalence of poverty: Percent of people living below the national threshold of poverty	HIES 2016	April 2016-March 2017

Indicator Baseline	Secondary data source	Dates of data collection*
Depth of poverty: Mean percent shortfall relative to the national threshold of poverty	HIES 2016	April 2016-March 2017
Average consumption shortfall of the poor: Mean percent shortfall and mean shortfall in USD (2005 PPP) of the poor relative to the national threshold of poverty	HIES 2016	April 2016-March 2017
Prevalence of exclusive breastfeeding among children under 6 months of age	BDHS 2017/2018	Oct 2017-March 2018
Prevalence of children 6-23 months receiving a minimum acceptable diet	BDHS 2017/2018	Oct 2017-March 2018
Components of a minimum acceptable diet among children age 6-23 months	BDHS 2017/2018	Oct 2017-March 2018
Prevalence of underweight women of reproductive age	BDHS 2017/2018	Oct 2017-March 2018
Prevalence of stunted children under 5 years of age	BDHS 2017/2018	Oct 2017-March 2018
Prevalence of wasted children under 5 years of age	BDHS 2017/2018	Oct 2017-March 2018
Prevalence of underweight children under 5 years of age	BDHS 2017/2018	Oct 2017-March 2018

*Survey administration dates for HIES 2010 are not provided in the HIES 2010 official report and, thus, are unavailable.

Summary of key findings

Household economic status

Daily per capita expenditures (2010 USD)

The Bangladesh Feed the Future ZOI endline estimates for mean daily per capita expenditures (as a proxy for income) in U.S. Government-assisted areas show an increase from $1.78 in 2011/2012 to $2.07 in 2018/2019—an increase of 16.3 percent. The difference is statistically significant at the 0.1 percent level.

Daily per capita expenditures among households with male and female adults and adult female only households increased by 15.9 percent and 16.4 percent, respectively. These increases are statistically significant at the 0.1 percent and the 5 percent levels, respectively.

Prevalence of poverty: Percentage of people living on less than $1.25/day (2005 PPP)

Poverty declined in the Feed the Future ZOI by 15.4 percentage points from 40.6 percent to 25.2 percent, or by 37.9 percent between 2011/2012 baseline and 2018/2019 endline. The reduction is statistically significant at the 0.1 percent level. Poverty declined more for adult female only households.

Depth of poverty: Mean percentage shortfall relative to the $1.25/day (2005 PPP) poverty line

The poverty gap or depth of poverty decreased by 4.7 percentage points, or by 50.5 percent. This reduction in the poverty gap is statistically significant at the 0.1 percent level. Similar to headcount poverty measures, adult female only households experienced the largest decrease in the poverty gap.

Women's empowerment in agriculture

A-WEAI

The Abbreviated Women's Empowerment in Agriculture Index (A-WEAI) is calculated using two sub-indices: (1) the five domains of empowerment (5DE), and (2) the gender parity index (GPI). The improvement in women's empowerment in the ZOI has been remarkable—less than one-third (30.5 percent) of women in the Feed the Future ZOI were empowered at the 2011/2012 baseline, which increased to over two-thirds (68.7 percent) at the 2018/2019 endline. Women's 5DE score increased from 0.67 to 0.89, whereas men's 5DE score increased from 0.77 to 0.86. The proportion of women achieving gender parity increased from 49.6 percent to 78.6 percent. Women's A-WEAI score increased by 30.9 percent—from 0.68 to 0.89 between 2011/2012 baseline and 2018/2019 endline. Disempowered women's average adequacy increased from 51.9 percent to 64.3 percent, whereas average adequacy among disempowered men was static (62.4 percent to 63.2 percent).

Household hunger and dietary intake

Prevalence of moderate and severe hunger

Increased incomes and poverty reduction in the Bangladesh Feed the Future ZOI are also reflected in the decrease in the prevalence of households with moderate or severe hunger, indicating an improvement in household-level food security. The prevalence of moderate and severe hunger dropped from 7.9 percent at baseline to 2.5 percent at endline, which is a 68.1 percent reduction. The reduction in hunger between baseline and endline is statistically significant at the 0.1 percent level.

Women's dietary diversity: Mean number of food groups consumed by women of reproductive age

There was a modest increase in women's dietary diversity, from 4.4 to 4.9 food groups–an improvement of 11.4 percent. Women's average consumption rose by 0.6 food groups. This change is statistically significant at the 0.1 percent level.

Prevalence of exclusive breastfeeding of children under 6 months of age

BDHS 2011 and 2017/2018 datasets were used to calculate the prevalence of exclusive breastfeeding of children under 6 months of age. In 2011, 64.8 percent of children under 6 months of age were exclusively breastfed. The prevalence of exclusive breastfeeding reduced to 52.7 percent by 2017/18 endline. The difference is statistically significant at the 5 percent level.

Prevalence of children 6-23 months of age receiving a minimum acceptable diet

BDHS 2011 and 2017/2018 datasets were used to calculate the prevalence of children 6-23 months receiving a minimum acceptable diet. The prevalence of children 6-23 months of age receiving a minimum acceptable diet increased by 40.2 percent—from about one-quarter (25.1 percent) to around one-third (35.2 percent). The difference is statistically significant at the 1 percent level.

Prevalence of underweight women of reproductive age (15-49 years of age)

Analysis of BDHS 2011 and 2017/2018 found that the prevalence of underweight women of reproductive age decreased from 22.2 percent in 2011 to 11.0 percent in 2017/2018. The difference is statistically significant at the 0.1 percent level.

Prevalence of stunted children under 5 years of age

Analysis of BDHS data show that the prevalence of stunted children under 5 years decreased from 38.6 percent in 2011 to 27.0 percent in 2017/2018. This represents a 30.1 percent decline, which is statistically significant at the 0.1 percent level.

Prevalence of wasted children under 5 years of age

BDHS 2011 and 2017/2018 datasets were used for calculating these estimates. The prevalence of wasted children under 5 years of age declined from 14.2 percent in 2011 to 7.4 percent in 2017/18—equivalent to a 47.9 percent decline. This reduction is statistically significant at the 0.1 percent level.

Prevalence of underweight children under 5 years of age

BDHS 2011 and 2017/2018 datasets were used for calculating these estimates. The prevalence of underweight children under 5 years of age decreased from about one-third (32.3 percent) in 2011 to 17.5 percent in 2017/2018. Therefore, between 2011 baseline and 2017/2018 endline, there was a 45.8 percent reduction in the prevalence of underweight children under-five, which is statistically significant at the 0.1 percent level.

1. BACKGROUND

Chapter 1 provides background information on Feed the Future in Bangladesh, including a description of the program and the demography of the Feed the Future Phase One Zone of Influence (ZOI).

1.1 Feed the Future overview

Feed the Future's collective efforts aim to improve the livelihood and nutritional status of households in Bangladesh through:

- Increased on-farm productivity
- Increased investment in market systems and value chains
- Enhanced food security policy and planning capacity
- Enhanced agriculture innovation capacity
- Improved nutritional status of rural poor

Core Investments

The United States is focusing its efforts in targeted regions and value chains to maximize impact. Concentrating resources, fostering political engagement, linking agriculture to nutrition, and supporting gender equality are critical investments to successfully improve food security throughout Bangladesh.

Targeted Investments

Feed the Future will have the highest impact with focused interventions in areas that offer opportunities to reduce poverty and undernutrition. It targets intensification of rice production by promoting higher-yield, saline/drought-resistant, and more nutritious rice by supporting research institutions, government policymakers, non-governmental organizations (NGOs), farmers, and the private sector. The initiative also supports diversification into higher-value, nutritious products, such as fruits, vegetables, fish, and livestock. This effort will increase farmers' incomes while also making more nutritious food available both in markets and at the household-level. Women are specifically targeted through promotion of homestead food production and nutrition education to encourage consumption of the diversified foods they produce.

Private Sector Engagement

Feed the Future supports private sector growth by identifying market constraints and working with the Government of Bangladesh and the private sector to eliminate constraints. It builds the capacity of farmers, small and medium enterprises, and civil society by promoting market linkages and improving access to market information.

Policy Reform

Feed the Future identifies and advocates for policy reforms, stimulates policy dialogue, and strengthens the analytical and monitoring capabilities of national institutions. It generates policy research to fill knowledge gaps in critical areas and communicate research outcomes to relevant stakeholders. It also works to improve the capacity of the government, civil society, farmers, and the private sector to engage in policy dialogue, with an emphasis on supporting and uplifting Bangladesh's most vulnerable populations.

Research and Innovation

Feed the Future strengthens agricultural research capacity with a focus on (1) crops that are resilient to climate change-related challenges, such as salinity, drought, and floods; (2) improved cost-effectiveness; (3) improved farming practices, including fertilizer use and better irrigation; and (4) high-value crops. Socioeconomic research is also prioritized, especially in the promotion of agribusiness marketing, value-added transformation, and analysis of the overall enabling environment. Natural resource management issues, such as soil fertility, erosion, and the impacts of pesticide use, are an important part of building research capacity in Bangladesh. Programs focus on strengthening extension services to farmers through government, NGOs, and the private sector to facilitate the dissemination of research results. In particular, efforts focus on gender roles in farming and household gardening activities and increasing the number and skills of female extension agents.

Nutrition

Through extension activities and community outreach, Feed the Future disseminates information on nutrition and social and behavioral change. In collaboration with the U.S. Government Global Health Initiative, Feed the Future improves nutrition service delivery for pregnant women and young children. Research on innovative nutrition technologies and bio-fortified varieties of rice are targeted toward improving the quality of food and preventing and treating undernutrition.

Climate Change

Crop research and development focus on improving resilience against climate change impacts associated with salinity, drought, and floods. Feed the Future efforts focus on use of energy and fertilizer, as well as on improved irrigation technologies to mitigate greenhouse gas production. Communities are being trained in conservation and sustainable agriculture practices. Feed the Future also promotes improved natural resource management, watershed protection, and sustainable management of water bodies, since Bangladesh is heavily dependent on fishery systems.

Gender Integration

Nutrition education focuses on women and children, though not to the exclusion of men. Extension activities reach out to women and ensure that women are well represented in Bangladeshi agricultural support services. Feed the Future's efforts encourage teaching the "whole family at once" approach to ensure access to women and the next generation of farmers and better information retention.

Women's Empowerment

Feed the Future prioritizes empowering women in the food and agriculture sector as a vehicle to ending hunger. Research in Bangladesh shows that enhancing women's empowerment can increase calorie availability and dietary diversity at the household-level.[5] Research also shows that women's empowerment in agriculture leads to increased crop diversification in the use of farmland in Bangladesh.[6] When women are economically empowered, their success leads to more-inclusive growth, better nutrition and health, and less hunger – all of which build resilience and self-reliance.

USAID collaborated with the International Food Policy Research Institute (IFPRI) and the Oxford Poverty and Human Development Initiative to develop the Women's Empowerment in Agriculture Index (WEAI) to directly capture women's empowerment and inclusion levels in the agricultural sector. Feed the Future utilizes WEAI data at the population- and program-levels to diagnose areas of empowerment and disempowerment, identify strategies to fill empowerment gaps, and assess the effectiveness of these interventions.

Whole-of-Government Approach

Feed the Future elevates coordination across the U.S. Government so that its investments, resources, and programs are harmonized for greater collective impact. This interagency engagement, led by USAID, includes collaboration with the U.S. Department of State, the U.S. Department of Agriculture, the U.S Department of the Treasury, the Millennium Challenge Corporation, the U.S. African Development Foundation, the U.S. Trade Representative, and the Overseas Private Investment Corporation. For example, the State Department will encourage regulatory reform and market liberalization to improve the business climate for farmers and the private sector.

1.2 Feed the Future Phase One ZOI profile

The geographic focus of the Feed the Future Bangladesh Phase One ZOI Survey endline assessment is the Phase One ZOI–the geographic area where the Feed the Future program is expected to have had an impact on hunger, poverty, and nutrition during the first phase of the Initiative.

The Bangladesh ZOI includes mostly rural areas of 20 districts consisting of 120 upazilas (sub-districts) in three divisions in the south and southwest region of the country. The three divisions and their respective districts are listed below:

1. Barishal Division (six districts): Barguna, Barishal, Bhola, Jhalakati, Patuakhali, and Pirojpur;
2. Dhaka Division (five districts): Faridpur, Gopalganj, Madaripur, Rajbari, and Shariatpur; and

[5] Sraboni et al. (2014)

[6] De Pinto, Seymour, and Bryan (2020)

3. Khulna Division (nine districts): Bagerhat, Chuadanga, Jashore, Jhenaidah, Khulna, Magura, Meherpur, Narail, and Satkhira.

Feed the Future targets investments in the ZOI in areas with the greatest growth potential for rice production and diversification, prioritizing high-value agricultural production, and with high levels of poverty and malnutrition. More than 28 million people live in Feed the Future's target regions in Bangladesh, where food security and nutrition face considerable challenges associated with scarce water resources, a rising sea level, vulnerability to extreme shocks, and changing weather patterns.

A map of the Feed the Future Phase One ZOI in Bangladesh is provided in **Figure 1.1**.

Figure 1.1: Map of the Feed the Future Bangladesh Phase One ZOI

1.2.1 Rationale for Phase One ZOI selection

USAID Feed the Future focus countries were selected based on country ownership potential, level of need, and opportunities to achieve success. By equipping people with the tools to feed themselves over the long term, Feed the Future is addressing the root causes of hunger and poverty. This long-term investment builds communities that are more resilient to drought, famine, and other natural disasters, and less dependent on emergency food assistance.

The Feed the Future ZOI in the southwest region of Bangladesh was selected for USAID development assistance based on the unique regional challenges to achieving food security, and its significant potential for improvements in agricultural productivity and market development. The topography of the south—flat, with multiple rivers and tributaries—leads to frequent flooding. With a coastline on the Bay of Bengal, the southern region is also prone to cyclones and saline water surge. Relative to the rest of the country, the physical infrastructure is poorer and markets—while widespread—function less well. Altogether, these regional factors in the ZOI undermine agricultural productivity and contribute to high levels of poverty and food insecurity. Feed the Future's targeted investments in the ZOI aim to mitigate these regional food security risks.

1.2.2 Demography of the ZOI

Table 1.2.1 and **Table 1.2.2** present individual and household population estimates for the Phase One ZOI at baseline in 2011/2012 and at endline in 2018/2019.[7] The tables include estimates of the total population and sub-populations. The sub-population categories correspond to the sub-populations for the Feed the Future indicators and disaggregates.

IFPRI researchers used population and housing data from the Bangladesh Bureau of Statistics' (BBS) Population and Housing Census 2011 for the 20 districts in the Feed the Future ZOI. The total population was 27,996,043 (28.0 million) and the total number of households was 6,810,237 (6.8 million) in the ZOI in 2011. IFPRI also obtained BBS data for the 20 ZOI districts for different age groups, disaggregated by gender. However, BBS did not have population data for the following age groups, disaggregated by gender: children 0-5 months, 6-23 months, and 6-59 months; or for pregnant and non-pregnant women. Therefore, researchers estimated the population of these age groups by using the proportional distribution of the respective groups from the Feed the Future ZOI Survey conducted by IFPRI in 2011/2012. For the 6-59 months group, IFPRI subtracted the population of the 0-5 months age group estimated from the 0-59 months population obtained from BBS to arrive at the 6-59 months population. Similarly, IFPRI estimated the percentage of pregnant and non-pregnant women in the total population of women of reproductive age (15-49 years) from the ZOI stratum of the BIHS 2011/2012. Researchers used the acquired proportions of the population of women of reproductive age from BBS to estimate the total population of pregnant and non-pregnant women in 2011.

BBS did not conduct a Population and Housing Census after 2011. Therefore, IFPRI researchers calculated the population growth rate in two stages. First, intercensal growth rates were used from the

[7] Although the Feed the Future interventions are implemented mostly in rural areas, the 20 districts and 120 sub-districts in the ZOI also include urban areas; therefore, both urban and rural population and households are reported in this section.

past three points of population census data (1981, 2001, and 2011) to predict the national-level population growth rate. Second, since it was observed that the population growth rate is lower in the 20 ZOI districts than the national population growth rate, the growth rates for these 20 districts were adjusted proportionally to obtain a ZOI-specific growth rate of 0.38 percent per year. Finally, IFPRI researchers estimated the total population in 2018/2019 in the ZOI to be 28,722,799 (28.7 million) by compounding the total population in 2011 at a growth rate of 0.38 percent per annum for seven years.

Moreover, since there was no population census in 2018/2019, researchers estimated the population growth rates from the BBS population census reports of 2001 and 2011 for specific age groups, disaggregated by gender, for 0-59 months, youth 15-29 years, and women 15-49 years (women of reproductive age). IFPRI researchers used these growth rates and the respective 2011 populations for each group and projected the 2018/2019 population for these classifications, as denoted by * in **Table 1.2.1**.

However, growth rates pertaining to other groups could not be estimated from the BBS population census since population data according to these classifications for 2001 were not available to estimate group-specific growth rates. As a result, for groups where growth rates were not available (denoted by ** in **Table 1.2.1**), IFPRI researchers used the Feed the Future Bangladesh ZOI Survey 2018/2019 to estimate the distributions for individuals 0-5 months, 6-23 months, 6-59 months, and pregnant and non-pregnant women in 2018/2019.

In addition, the total number of households for 2018/2019 was estimated to be 7,232,501 (7.2 million) by dividing the total ZOI endline population by the average household size obtained from the Feed the Future Phase One ZOI Survey data. Since the total number of households disaggregated by categories were not available, IFPRI researchers used the Feed the Future ZOI 2018/2019 endline and estimated the distribution of households by these categories. These proportions were attributed to the estimated total number of households in 2018/2019 to project the disaggregated number of households by categories.

In sum, between 2011/2012 baseline and 2018/2019 endline, the number of households within the ZOI was estimated to have increased by 6.2 percent (from 6,810,237 to 7,232,501), and the number of individuals was estimated to have increased by 3.0 percent between the survey rounds (from 27,966,043 to 28,722,799).[8] The proportion of key sub-populations living in the Feed the Future ZOI remained relatively constant between 2011/2012 and 2018/2019. Although the composition of individuals in a household disaggregated by age remained relatively constant, the percentage of male youth 15-29 years of age declined slightly, from 45.4 percent to 41.6 percent between 2011/2012 and 2018/2019.

[8] Ahmed et al. (2018)

Table 1.2.1: Population of Individuals in the Phase One ZOI, by Category, Bangladesh, 2011/2012 to 2018/2019

Category of individuals	Baseline (2011/2012)		Endline (2018/2019)		Diff.
	n[a]	Percent	n[a]	Percent	
Total number of individuals*	27,966,043	100.0	28,722,799	100.0	756,756
Total number of individuals, by key sub-population					
Children 0-5 months**	195,762	0.7	287,228	1.0	91,466
Children 0-23 months**	922,880	3.3	1,034,021	3.6	111,141
Children 6-23 months**	727,118	2.6	746,793	2.6	19,675
Children 0-59 months*	2,824,571	10.1	2,240,378	7.8	-584,193
Youth 15-29 years*	7,802,526	27.9	7,554,096	26.3	-248,430
Women of reproductive age (15-49 years)*	7,383,035	26.4	8,358,334	29.1	975,299
Primary adult female decision-makers	6,767,782	24.2	7,496,651	26.1	728,869
Total number of individuals, by residence[b]					
Urban*	3,719,484	13.3	3,733,964	13.0	14,480
Rural*	24,246,559	86.7	24,988,835	87.0	742,276
Total number of individuals, by gendered household type					
Male and female adults**	25,197,405	90.1	25,850,519	90.0	653,114
Female adults only**	2,740,672	9.8	2,757,389	9.6	16,717
Male adults only**	27,966	0.1	114,891	0.4	86,925
Children only	—	—	—	—	—
Children 0-5 months, by sex					
Male**	103,754	53.0	151,656	52.8	47,902
Female**	92,008	47.0	135,572	47.2	43,564
Children 0-23 months, by sex					
Male**	467,313	50.7	565,379	55.3	98,066
Female**	455,567	49.3	468,642	44.7	13,075
Children 6-23 months, by sex					
Male**	363,559	50.0	413,723	55.4	50,164
Female**	363,559	50.0	333,070	44.6	-30,489
Children 0-59 months, by sex					
Male*	1,429,233	50.6	1,115,708	49.8	-313,525
Female*	1,395,338	49.4	1,124, 670	50.2	-270,668
Youth 15-29 years, by sex					
Male*	3,542,347	45.4	3,142,504	41.6	-399,843
Female*	4,260,179	54.6	4,411,592	58.4	151,413
Women of reproductive age, by pregnancy status					
Pregnant**	295,321	4.0	334,333	4.0	39,012
Non-pregnant**	7,087,714	96.0	8,024,001	96.0	936,287
Primary adult female decision-makers, by age					
18-29 years	1,928,818	28.5	1,379,384	18.4	-549,434
30 years or older	4,838,964	71.5	6,117,267	81.6	1,278,303

Diff.=difference
— = Data not available
[a] Number of individuals in the population

[b] The urban/rural disaggregate uses the Bangladesh-specific definition of urban and rural reflected in the sampling frame at the time the sample was drawn.
* Total number of households in 2018/2019 in the Feed the Future ZOI are projected using inter-census growth rates estimated from the Bangladesh Bureau of Statistics 2001 and 2011 population census data for the ZOI.
** Inter-census growth rates of households for these classifications could not be acquired because the needed disaggregated data were not available from the BBS 2001 and 2011 Population and Housing Census. Therefore, IFPRI researchers used Feed the Future ZOI Survey data to estimate the respective distributions of these groups and used these estimates to project disaggregated household numbers for 2018/2019.
Source: Bangladesh Bureau of Statistics (BBS) 2001 and 2011 Population and Housing Census; Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table 1.2.2: Number of Households in the Phase One ZOI, by Category, Bangladesh 2011/2012 to 2018/2019

Category of households	Baseline (2011/2012)		Endline (2018/2019)		Diff.
	n[a]	Percent	n[a]	Percent	
Total number of households	6,810,237	100.0	7,232,501	100.0	422,264
Total number of households, by gendered household type					
Male and female adults**	5,843,183	85.8	6,234,416	86.2	391,233
Female adults only**	946,623	13.9	954,690	13.2	8,067
Male adults only**	20,431	0.3	43,395	0.6	22,964
Children only	—	—	—	—	—
Total number of households, by residence[d]					
Urban*	1,035,156	15.2	1,048,713	14.5	13,557
Rural*	5,775,081	84.8	6,183,788	85.5	408,707

Diff=difference
— = Data not available
[a] Number of households in the population
[b] The urban/rural disaggregate uses the Bangladesh-specific definition of urban and rural reflected in the sampling frame at the time the sample was drawn.
* Total number of households in 2018/2019 in the Feed the Future ZOI is projected using inter-census growth rates estimated from the Bangladesh Bureau of Statistics 2001 and 2011 population census data for the ZOI.
** Inter-census growth rates of households for these classifications could not be acquired because the needed disaggregated data were not available from the BBS 2001 and 2011 Population and Housing Census. Therefore, IFPRI researchers used Feed the Future ZOI survey data to estimate the respective distributions of these groups and used these estimates to project disaggregated household numbers for 2018/2019.
Source: Bangladesh Bureau of Statistics (BBS) 2001 and 2011 Population and Housing Census; Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

1.3 Purpose of this assessment

The purpose of this assessment is to provide the U.S. Government interagency partners, USAID RFS, the USAID Bangladesh Mission, the Government of Bangladesh, and development partners with information to monitor long-term progress of the Feed the Future Phase One ZOI indicators in Bangladesh.

The assessment is designed to measure changes in key indicator estimates between the Feed the Future Phase One Baseline ZOI Survey, which was conducted in 2011/2012, and the Feed the Future Phase One Endline ZOI Survey, which was conducted in 2018/2019. Feed the Future ZOI Survey sample calculations, however, are not designed to support conclusions of causality or program attribution.

2. METHODOLOGIES FOR OBTAINING BASELINE AND ENDLINE VALUES FOR FEED THE FUTURE INDICATORS

Chapter 2 describes the methodology used to obtain the Feed the Future Phase One ZOI indicators at baseline and endline. It provides information on the data sources used in the assessment and describes measures and reporting conventions used throughout the report.

2.1 Data sources

Data for the indicators presented in this assessment are drawn primarily from IFPRI's BIHS conducted in 2011/2012 (baseline) and 2018/2019 (endline). The BIHS sample is statistically representative at the following levels: (1) nationally of rural Bangladesh; (2) of rural areas of each of the seven administrative divisions of the country: Barishal, Chattogram, Dhaka, Khulna, Rajshahi, Rangpur, and Sylhet; and (3) representative of the Feed the Future ZOI in Bangladesh.[9] Data for the ZOI stratum of the BIHS 2011/2012 baseline were collected from October 2011-March 2012, and data from the ZOI stratum of the BIHS were collected from November 2018-February 2019 for the endline.

Secondary data sources used for assessing select nutrition indicators and poverty indicators include the Bangladesh Demographic and Health Surveys (BDHS) 2011 and 2017/2018 and Household Income and Expenditure Surveys (HIES) 2010 and 2016, respectively. **Table 2.1.1** summarizes the data sources and their respective fieldwork dates, by Phase One ZOI indicator, for both baseline and endline. Primary and secondary data sources are described in the following sections.

[9] Bangladesh had seven divisions when the sampling was done for the BIHS 2011/2012 baseline. In September 2015, the Government of Bangladesh announced Mymensingh as a division. Since BIHS is a panel survey, which used the same sample of households in baseline, midline, and endline surveys, statistically representative sampling was not done for Mymensingh division.

Table 2.1.1: Feed the Future Phase One Baseline and Endline ZOI Indicator Data Sources and Dates of Data Collection

Indicator	Baseline		Endline	
	Data source	Date Collected	Data source	Date collected
Daily per capita expenditures (2010 USD)	BIHS ZOI Survey	Oct 28, 2011-March 15, 2012	BIHS ZOI Survey	Nov 11, 2018-Feb 6, 2019
Prevalence of poverty: Percentage of people living on less than $1.25/day (2005 PPP)	BIHS ZOI Survey	Oct 28, 2011-March 15, 2012	BIHS ZOI Survey	Nov 11, 2018-Feb 6, 2019
Depth of poverty: Mean percentage shortfall relative to the $1.25/day (2005 PPP) poverty line	BIHS ZOI Survey	Oct 28, 2011-March 15, 2012	BIHS ZOI Survey	Nov 11, 2018-Feb 6, 2019
Abbreviated Women's Empowerment in Agriculture Index	BIHS ZOI Survey	Oct 28, 2011-March 15, 2012	BIHS ZOI Survey	Nov 11, 2018-Feb 6, 2019
Prevalence of moderate and severe hunger	BIHS ZOI Survey	Oct 28, 2011-March 15, 2012	BIHS ZOI Survey	Nov 11, 2018-Feb 6, 2019
Women's dietary diversity: Mean number of food groups consumed by women of reproductive age	BIHS ZOI Survey	Oct 28, 2011-March 15, 2012	BIHS ZOI Survey	Nov 11, 2018-Feb 6, 2019
Prevalence of exclusive breastfeeding among children under 6 months of age	BDHS	July 8-Dec 27, 2011	BDHS	Oct 24, 2017-March 15, 2018
Percent of children 6-23 months of age receiving a minimum acceptable diet	BDHS	July 8-Dec 27, 2011	BDHS	Oct 24, 2017-March 15, 2018
Prevalence of underweight women of reproductive age	BDHS	July 8-Dec 27, 2011	BDHS	Oct 24, 2017-March 15, 2018
Prevalence of stunted children under 5 years of age	BDHS	July 8-Dec 27, 2011	BDHS	Oct 24, 2017-March 15, 2018
Prevalence of wasted children under 5 years of age	BDHS	July 8-Dec 27, 2011	BDHS	Oct 24, 2017-March 15, 2018
Prevalence of underweight children under 5 years of age	BDHS	July 8-Dec 27, 2011	BDHS	Oct 24, 2017-March 15, 2018

PPP=Purchasing power parity

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019; Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

2.1.1 Baseline

IFPRI conducted the Feed the Future Bangladesh Phase One baseline assessment using primary data from the Feed the Future ZOI stratum of the BIHS 2011/2012 to estimate per capita expenditure, poverty, hunger, and the WEAI.

IFPRI used secondary data from the 2011 BDHS to calculate six nutrition indicators for the ZOI, including (1) prevalence of exclusive breastfeeding among children under 6 months of age, (2) percent of children 6-23 months of age receiving a minimum acceptable diet, (3) prevalence of underweight women of reproductive age, (4) prevalence of stunted children under 5 years of age, (5) prevalence of wasted children under 5 years of age, and (6) prevalence of underweight children under 5 years of age. Additionally, IFPRI used secondary data from the 2010 HIES to estimate poverty in the Feed the Future ZOI based on national poverty lines.

This section proceeds by describing the primary data, followed by the secondary data sources.

Primary data

The Feed the Future Phase One Baseline ZOI Survey was implemented by IFPRI as part of the BIHS 2011/2012. Data collection in the Feed the Future ZOI stratum took place in 20 districts in southern Bangladesh, which is divided between three divisions—that is, Barishal, Khulna, and part of Dhaka Division—from October 28, 2011 to March 15, 2012. IFPRI implemented the Feed the Future Phase One Endline ZOI Survey as part of the BIHS in 2018/2019. The endline survey was administered on the same households as baseline from November 11, 2018 to February 6, 2019, which makes the ZOI 2011/2012 baseline and 2018/2019 endline survey data directly comparable. Therefore, the panel format of the dataset means the economic progress of these households between 2011/2012 and 2018/2019 can be assessed from the ZOI baseline and endline surveys.

Response rates

Table 2.1.2 compares the response rates for the Feed the Future Bangladesh 2011/2012 baseline and 2018/2019 endline surveys. The table presents components and the response rates for sampled households, women of reproductive age (15-49 years), primary adult male and female decision-makers, and children under 2 years and 5 years of age.

Overall, there were 2,040 households that were selected and were interviewed for the Feed the Future Bangladesh ZOI 2011/2012 baseline survey. Between the 2011/2012 baseline and 2018/2019 endline, 162 households split and 138 households attrited (a 6.8 percent attrition rate). The 2018/2019 endline survey selected the 2,040 households that were initially interviewed at baseline plus 162 households for a total of 2,202 households, of which 2,064 households completed the endline survey.

Table 2.1.2: Comparison of Results of Household and Individual Interviews in the Phase One ZOI, in Total and by Residence, Feed the Future Phase One Baseline and Endline ZOI Surveys

Response rate	Baseline (2011/2012)	Endline (2018/2019)
Households		
Number of households selected	2,040	2,202
Number of households occupied	2,040	2,070
Number of households interviewed	2,040	2,064
Household response rate (%)[a]	100.0	99.7
Women of reproductive age (15-49 years)		
Number of eligible women	2,213	2,286
Number of eligible women interviewed	2,125	2,151
Eligible women response rate (%)[b]	96.0	94.1
Primary adult female decision-makers (18+ years)		
Number of eligible women	2,079	2,064
Number of eligible women interviewed	2,078	2,051
Eligible women response rate (%)[b]	99.9	99.4
Primary adult male decision-makers (18+ years)		
Number of eligible men	1,763	1,777
Number of eligible men interviewed	1,762	1,755
Eligible men response rate (%)[b]	99.9	98.8
Children under 5 years of age		
Number of eligible children	1,863	1,723
Number of caregivers of eligible children interviewed	1,734	1,647
Eligible children response rate (%)[b]	93.1	95.6
Children under 2 years of age		
Number of eligible children	542	511
Number of caregivers of eligible children interviewed	522	499
Eligible children response rate (%)[b]	96.3	97.7

[a] Household response rates are calculated based on the result codes of Module 1, the household roster, and are defined as the number of households interviewed divided by the number of households occupied. Households that were found to be vacant, not a dwelling unit, or destroyed were considered unoccupied and thus excluded from the response rates.

[b] Individual response rates are calculated based on the result codes in the relevant individual modules (Modules 4, 5, and 6). These rates are defined as the number of eligible individuals interviewed divided by the number of eligible individuals. Eligibility determination for Modules 4, 5, and 6 is initiated in the household roster and confirmed in the respective module. (Note that for children under 5 years of age [Module 5], the primary caregivers of the children served as the respondents, not the children directly.)

Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018; Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Survey sample design

The Feed the Future ZOI stratum is a part of the BIHS. The BIHS 2011/2012 baseline sample is statistically representative at the following levels: (1) nationally representative of rural Bangladesh; (2) representative of rural areas of each of the seven administrative divisions of the country: Barishal, Chattogram, Dhaka, Khulna, Rajshahi, Rangpur, and Sylhet;[10] and (3) representative of the Feed the Future ZOI. USAID provided the list of ZOI locations (districts and upazilas). In preparation for conducting the 2011/2012 baseline survey, USAID provided IFPRI the list of Feed the Future locations (districts and *upazilas* [i.e., subdistricts]). IFPRI hired a consultant statistician who sampled the ZOI stratum separately for its statistical representativeness.

A sound and appropriate statistical method was used to calculate the total BIHS sample size of 6,500 households in 325 primary sampling units (PSUs [that is, villages]) using the sampling frame developed from the community series of the 2001 population census of Bangladesh. Later, sampling weights were adjusted based on the latest population census of 2011.[11] The domain of the national BIHS was all rural areas of the entire country, and the domain of the Feed the Future ZOI represented 120 upazilas in 20 districts, including urban areas within these upazilas. Urban district headquarters were excluded from the survey sample. The 20 ZOI districts belong to three divisions: (1) Barishal, (2) Dhaka, and (3) Khulna.

For the national-level sampling, all rural areas of the country were stratified into seven strata representing the seven divisions. The ZOI represents a separate stratum, including rural areas of the Feed the Future ZOI. The national survey sample consisted of 5,500 households in 275 PSUs and the Feed the Future ZOI sample included 1,000 households in 50 PSUs. The Neyman allocation method, which takes into account the size of the stratum as well as the variability within the stratum, was used to allocate the 275 sample PSUs among seven strata representing the seven divisions. Since the domain of the Feed the Future ZOI stratum includes upazilas from three divisions, proportional allocation was made to distribute the sample of 50 PSUs to three divisions.

The sample design of the BIHS followed a stratified sampling in two stages for selecting PSUs and then selecting households within each PSU. During the first stage, the number of PSUs (villages) allocated to each stratum were randomly selected with probability proportional to size (size being the number of households in each village) from the list of all villages within the stratum obtained from the 2001 population census data. In the second stage, 20 households were randomly selected from each PSU from the list of all households in the PSU.

Initially, the ZOI stratum had a sample of 1,000 households in 50 PSUs. However, IFPRI researchers recognized that the sample size was inadequate for certain disaggregated analyses of the data from the ZOI sample of 1,000 households, such as by age categories, gendered household type, and some non-rice crops, such as maize. To obtain more robust estimates of disaggregated analysis and after

[10] The administrative structure of Bangladesh consists of divisions, districts, upazilas, and unions, in decreasing order by size. When BIHS sampling was carried out in 2011, there were 7 divisions, 64 districts, 484 upazilas, and 4,498 unions (all rural). However, a division called Mymensingh was created in 2015 from districts previously comprising the northern part of Dhaka Division.

[11] The BIHS sampling was done by a consultant statistician, former Chief Statistician at the Bangladesh Bureau of Statistics, Ministry of Planning.

consultation with USAID, IFPRI researchers expanded the ZOI sample using the following approach: The BIHS national sampling frame consists of 135 PSUs in Barishal, Dhaka, and Khulna divisions (strata), of which 52 PSUs (with 1,040 sample households) belong to ZOI survey upazilas (sub-districts). These 52 PSUs—which are common in both national and ZOI domains—were added to the original ZOI sample of 50 PSUs, giving the total sample of 2,040 households in 102 PSUs for the 2011/2012 ZOI baseline. This process did not entail any additional sample draws.

Since the sampling frame of the BIHS has the ZOI stratum and the seven strata representing the seven divisions, the analysis of data from the expanded sample from the three divisional strata required estimation of appropriate sampling weights to obtain results that are statistically representative of the ZOI. The consultant statistician calculated the sampling weights and trained IFPRI research analysts on the use of the weights in analyzing the expanded sample of the ZOI dataset.

The Phase One ZOI endline assessment in 2018/2019 surveyed the same households from the Phase One baseline survey conducted in 2011/2012, making BIHS a panel dataset. Due to attrition, household merges, and household splits, the total number of Feed the Future ZOI households under the 2018/2019 endline survey was 2,064.

Households surveyed at 2011/2012 baseline were tracked for the 2018/2019 endline survey using information, such as address, GPS coordinates and description of surrounding areas that were collected during the 2011/2012 baseline and updated during the 2015 midline survey, if relevant. BIHS uses a multi-respondent-based questionnaire. This means that all members of the household are tracked for a survey interview. During the 2018/2019 endline survey, the enumerators were equipped with household roster information that was collected during the 2011/2012 baseline and later updated during the 2015 midline survey. The enumerators updated information about previous household members and added any new household members in the roster. The member status of household members who were present during the previous survey rounds but were absent at the 2018/2019 endline were updated during the survey.

If a household was found to have relocated within the same sub-district (upazila) during one of the subsequent survey rounds, then the household was tracked and interviewed. If the household relocated *outside* the upazila, it was not followed and interviewed. Similarly, split households, formed by multiple members of the original household, that were within the same upazila of the original household were tracked and interviewed for the survey.

At baseline, 2,040 households were selected and surveyed for the Feed the Future Phase One ZOI stratum of the BIHS 2011/2012. Between baseline and endline survey rounds, 162 split households were formed from the original 2,040 households. Therefore, a total of 2,202 households were considered for the survey at the endline. However, of the 2,040 original households, 1,908 households were surveyed while 132 households attrited. From the 162 split households, 156 split households were surveyed while 6 split households attrited. This means a total of 1,908 + 156 = 2,064 households were surveyed at the endline. All households interviewed for the Feed the Future stratum of BIHS were within the ZOI.

More details on sample sizes and response rates are presented in **Table 2.1.2**. Appendix 2.1 provides additional details on the sampling and weighting methodology.

Questionnaire design

IFPRI has extensive experience in the design and implementation of similar surveys in Bangladesh and other countries. IFPRI researchers also consulted the 2010 HIES questionnaires to collect data on a comparable set of variables.

The BIHS questionnaires include modules that provide an integrated data platform to answer a variety of research questions and to track progress of the Feed the Future population-level indicators. USAID gave IFPRI a list of indicators and IFPRI researchers designed the BIHS questionnaire to ensure that the BIHS collected the necessary data to measure them.

IFPRI drafted the first version of the survey questionnaire for the Feed the Future ZOI survey, which was produced in consultation with USAID. Revisions of the questionnaires took place during the following periods: (1) upon receipt of the questionnaires for initial translation and adaptation of the questionnaires to the local context before the survey enumerator training; and (2) following the survey enumerator training and practice session/pretest (testing stage), during which feedback was incorporated.

After the first draft questionnaire was received from IFPRI, Data Analysis and Technical Assistance (DATA)—a local survey firm subcontracted by IFPRI for survey preparation and field-level data collection—translated the questionnaire into Bangla, during which IFPRI and DATA worked closely to ensure appropriateness and clarity in the local context. For example, during the translation phase, some questions were rephrased, modified to provide examples where necessary, and the survey questionnaire was reformatted to make it easier for the survey enumerators to deliver the questions.

Timing of the survey

The Feed the Future ZOI 2011/2012 baseline survey took place from October 28, 2011 to March 15, 2012. The Feed the Future ZOI 2018/2019 endline survey was conducted from November 11, 2018 to February 6, 2019. The endline survey was disrupted for approximately one week due to national elections in December 2018. The BIHS ZOI surveys were designed and administered to mitigate seasonal bias in the data (**Table 2.1.5**).

Listing

The household listing process for the ZOI 2011/2012 baseline survey followed several steps. First, after selecting the 102 villages (PSUs) in the first stage of sampling, a complete census was conducted in each of the selected villages where the number of households residing in the village was less than or equal to 300. If the number of households in the village was greater than 300, the village was hypothetically segmented and clusters of around 300 households were formed. One cluster was then randomly selected, and a complete census was conducted in the selected cluster. Then, 20 households were randomly selected from each village/cluster from the census list of households. Interviews were conducted, where male enumerators interviewed the male respondents and female enumerators interviewed the female respondents of each selected household.

Training for main fieldwork

Survey training for the ZOI baseline and ZOI endline surveys followed a similar format. Prior to fieldwork, under IFPRI's guidance and supervision, DATA trained all field staff on survey procedures,

including preparing for fieldwork, questionnaire content, human subjects protection, fieldwork procedures, data management, reporting, and communications. Training included hands-on, practical sessions that covered the use of all technical equipment that were used during the survey, as well as pretest and a survey pilot test. The survey training for the main endline survey fieldwork took place over nine weeks, from September 5 to November 11, 2018.

The questionnaire was pre-tested in the field to ensure that the survey questionnaire was error-free and to serve as an end-to-end rehearsal of all content and survey procedures.

Fieldwork

DATA provided 23 seven-member field teams composed of a field supervisor and three male and three female interviewers who collected the ZOI endline data over 12 weeks—that is, from November 11, 2018 to February 6, 2019.

Because of the gender-sensitive nature of some aspects of the social survey questionnaire, female interviewers interviewed female respondents and male interviewers interviewed male respondents. Each field team travelled together in a vehicle.

Each field team was visited regularly by a team from Dhaka, including DATA and IFPRI staff, to ensure that field teams had the supplies needed and that any problems that required central administration support received prompt attention. The visiting teams also provided the interviewer teams with moral support and an additional layer of field supervision and quality assurance.

Data management and analysis

For the Feed the Future ZOI Survey data analysis, IFPRI calculated indicators using Feed the Future standard guidance in the *Feed the Future Indicator Handbook* and population-based survey guidance.

IFPRI and DATA took extensive care to ensure the quality of the household survey data. In the field, survey supervisors routinely oversaw interviews conducted by enumerators and verified that enumerators completed all questionnaires daily. If the supervisors detected inconsistencies in responses in completed questionnaires, they visited the related respondents to determine the reasons and correct the responses as needed. In addition, DATA's supervisors made random checks of about 10 percent of the completed questionnaires by revisiting the sample households. IFPRI researchers made frequent field visits to supervise the fieldwork.

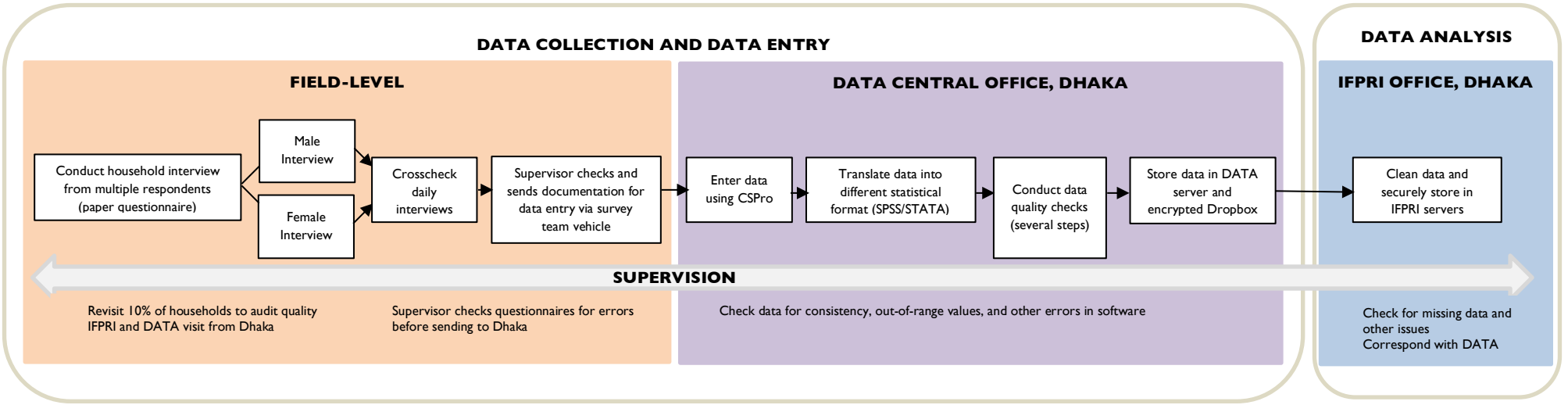
The DATA office in Dhaka carried out the data entry simultaneously during data collection, with about a week's time lag. Efforts were made to enter the data as soon as possible after data collection in case there were errors that could only be addressed by returning to the village where the errors occurred.

DATA completed data entry by using a customized data input software developed by DATA using CSPro that was programmed to identify values that were out of range or inconsistent with other responses in the questionnaire.

For both the Feed the Future 2011/2012 baseline and 2018/2019 endline datasets, DATA carried out a double entry method of data input, where the same data were entered by two individuals to minimize

data entry errors in the final dataset. **Figure 2.1** summarizes DATA and IFPRI's primary data processing steps under the Feed the Future endline survey.

Figure 2.1: Data processing steps under the Feed the Future 2018/2019 endline survey



Source: Constructed by authors.

Respect for the confidentiality of respondent information was maintained throughout the survey process. Interviewers were not allowed to interview anyone they know or to discuss any identifiable respondent's information with anyone other than the field team member or field supervisor. All data transmitted to the IFPRI servers were encrypted. Datasets for internal USAID use will retain only personally identifiable information (PII) that are essential to analysis (household GPS coordinates); these data will not be shared publicly. All PII and other information that would allow deduction of respondent identities will be stripped from the 2018/2019 endline dataset before it is made public, as was done for the 2011/2012 first round dataset, which is openly available online.[12] All research staff working with survey data, both in the country and at IFPRI offices, completed the Collaborative Institutional Training Initiative training before working on the survey.

Indicator analysis was completed using Stata statistical analysis software version 15.0.

Secondary data

The secondary data sources used to calculate Feed the Future Phase One ZOI indicators at baseline include HIES 2010 and BDHS 2011. **Table 2.1.3** presents the sample sizes for secondary data sources used at baseline by data source and ZOI indicator.

Table 2.1.3: Sample Sizes and Response Rates for Secondary Data Sources Used at Baseline

Data source	Indicator	Population sampled	Sample size in the Phase One ZOI	Response rate
HIES 2010	Prevalence of poverty at national extreme threshold of poverty	1,780	1,780	100.0
HIES 2010	Depth of poverty at national extreme threshold of poverty	1,780	1,780	100.0
HIES 2010	Average consumption shortfall of the poor relative to the national extreme threshold of poverty	317	317	100.0
HIES 2010	Prevalence of poverty at national threshold of poverty	1,780	1,780	100.0
HIES 2010	Depth of poverty at national threshold of poverty	1,780	1,780	100.0
HIES 2010	Average consumption shortfall of the poor relative to the national threshold of poverty	549	549	100.0
BDHS 2011	Prevalence of exclusive breastfeeding among children under 6 months of age	194	194	100.0
BDHS 2011	Prevalence of children 6-23 months receiving a minimum acceptable diet	534	533	99.8
BDHS 2011	Components of a minimum acceptable diet among children age 6-23 months	534	533	99.8
BDHS 2011	Prevalence of underweight women of reproductive age	4,469	4,327	96.8
BDHS 2011	Prevalence of stunted children under 5 years of age	2,037	1,797	88.2
BDHS 2011	Prevalence of wasted children under 5 years of age	2,037	1,797	88.2
BDHS 2011	Prevalence of underweight children under 5 years of age	2,037	1,797	88.2

Source: Bangladesh Demographic and Health Survey (BDHS), 2011; Household Income and Expenditure Survey (HIES), 2010.

[12] The BIHS 2011/2012 dataset is openly available online at the following link: https://dataverse.harvard.edu/dataset.xhtml?persistentId=hdl:1902.1/21266

Note: The 'Population sampled' column contains the number sampled (i.e., household/individual) in the sample ZOI areas. This will include non-response/flagged households or individuals. The 'Sample size in the phase one ZOI' column contains the number of samples that actually have the indicator information. This number is after removing the missing values.

Bangladesh Demographic and Health Survey 2011

BDHS 2011 data were used to calculate estimates for select nutrition indicators (see **Table 2.1.3**).

USAID/Bangladesh advised IFPRI to use BDHS 2011 data to analyze select nutrition indicators for the Feed the Future ZOI baseline. The BDHS 2011 report provides national-level estimates, as well as estimates disaggregated by each of the seven divisions of Bangladesh. The BDHS 2011 was designed to be statistically representative of national rural and urban, and divisions of Bangladesh, but it did not include a statistically representative stratum for the Feed the Future ZOI.

In consultation with USAID, IFPRI used district-level data from the 20 ZOI districts to estimate the baseline nutritional status of male and female children and adults.

Household Income and Expenditure Survey (HIES) 2010

Poverty estimates (prevalence of poverty, depth of poverty, and shortfall of the poor) at the national extreme poverty threshold (lower poverty line) and national poverty threshold (upper poverty line) were calculated from the HIES, published by the BBS, which is the Government of Bangladesh's central agency for collecting the national demographic and economic statistics. For the purpose of the analysis presented in this report, HIES 2010 was regarded as the baseline. HIES 2010 survey was representative at the national- and division-level, but not representative of the Feed the Future ZOI. Since only a small part of Dhaka division belongs to the ZOI, IFPRI used the average estimates of poverty from the combined sample of rural Barishal and rural Khulna divisions from the HIES data to measure poverty indicators at the national extreme poverty threshold and national poverty threshold to represent the entire Feed the Future ZO because only a small part of Dhaka division belongs to the ZOI.

2.1.2 Endline

IFPRI conducted the Feed the Future Bangladesh Phase One 2018/2019 endline assessment. IFPRI used primary data from the Feed the Future ZOI stratum of BIHS 2018/2019 and secondary data from HIES 2016 and BDHS 2017/2018 to calculate the ZOI endline indicators. BDHS 2017/2018 data were used to analyze select nutrition indicators. IFPRI's methodology for analyzing the secondary data sources are the same as what is described in Section 2.1.1 Baseline.

Secondary data

This section discusses the use of secondary data sources for the calculation of Feed the Future Phase One ZOI indicators at endline. **Table 2.1.4** presents the sample sizes for secondary data sources used at the endline by data source and ZOI indicator.

Table 2.1.4: Sample Sizes and Response Rates for Secondary Data Sources Used at Endline

Data source	Indicator	Population sampled	Sample size in the Phase One ZOI	Response rate
HIES 2016	Prevalence of poverty at national extreme threshold of poverty	7,903	7,903	100.0
HIES 2016	Depth of poverty at national extreme threshold of poverty	7,903	7,903	100.0
HIES 2016	Average consumption shortfall of the poor relative to the national extreme threshold of poverty	980	980	100.0
HIES 2016	Prevalence of poverty at national threshold of poverty	7,903	7,903	100.0
HIES 2016	Depth of poverty at national threshold of poverty	7,903	7,903	100.0
HIES 2016	Average consumption shortfall of the poor relative to the national threshold of poverty	1,912	1,912	100.0
BDHS 2017/2018	Prevalence of exclusive breastfeeding among children under 6 months of age	236	236	100.0
BDHS 2017/2018	Prevalence of children 6-23 months receiving a minimum acceptable diet	537	537	100.0
BDHS 2017/2018	Components of a minimum acceptable diet among children age 6-23 months	537	537	100.0
BDHS 2017/2018	Prevalence of underweight women of reproductive age	4,681	4,627	98.8
BDHS 2017/2018	Prevalence of stunted children under 5 years of age	1,922	1,769	92.0
BDHS 2017/2018	Prevalence of wasted children under 5 years of age	1,922	1,763	91.7
BDHS 2017/2018	Prevalence of underweight children under 5 years of age	1,922	1,797	93.5

Source: Bangladesh Demographic and Health Survey (BDHS), 2017/2018.

Bangladesh Demographic and Health Survey 2017/2018

The nutrition indicators that were calculated for the baseline assessment using BDHS 2011 data were also calculated for the endline assessment using BDHS 2017/2018 data. For IFPRI's analysis, BDHS 2017/2018 was regarded as the endline for select nutrition indicators. BDHS surveys are representative at the national-level, but were not designed to be statistically representative of the Feed the Future ZOI. IFPRI used district-level data from the 20 ZOI districts to estimate the endline nutritional status of male and female children and adults, which were then compared with the district-level data analyzed from the BDHS 2011 dataset (baseline).

Household Income and Expenditure Survey 2016

Poverty estimates (prevalence of poverty, depth of poverty, and shortfall of the poor) at the national extreme poverty threshold (lower poverty line) and national poverty threshold (upper poverty line) were calculated from the HIES, published by BBS, which is the Government of Bangladesh's central office

for collecting demographic and economic statistics of the country. For our analysis, HIES 2016 was regarded as the endline. HIES surveys are representative at the national-level, as well as the division-level. However, HIES did not include a statistically representative stratum for the Feed the Future ZOI. Since only a small part of Dhaka division belongs to the ZOI, IFPRI decided to use the average estimates of poverty from the combined sample of rural Barishal and rural Khulna divisions from the HIES data to measure poverty indicators at the national extreme poverty threshold and national poverty threshold to represent the entire Feed the Future ZOI.

Poverty estimates at the national extreme poverty threshold and national poverty threshold for the Feed the Future ZOI baseline assessment were also generated from BBS's HIES data. HIES 2010 is considered the baseline since that survey year is the closest available national survey to the BIHS 2011/2012. Similarly, HIES 2016 is the closest available national survey to BIHS 2018/2019. Consumption expenditure was calculated using the same methodology for both HIES 2010 and 2016. Furthermore, the national extreme poverty line and national poverty line thresholds, published in the HIES 2010 and 2016 reports by BBS, share the same base year (2005). More details can be found in Chapter 4 of this report.

2.1.3 Comparability of data sources

This section discusses the comparability of data sources used to calculate Feed the Future Phase One ZOI indicators with respect to seasonality.

Seasonality

Table 2.1.5 presents the season in which data collection took place for each indicator at baseline and endline. The BIHS ZOI baseline survey took place from October 28, 2011 to March 15, 2012, which can be considered the non-lean season mostly. The BIHS ZOI endline survey took place from November 11, 2018 to February 6, 2019, which is the non-lean season.

It is essential to have an historical context of seasonality dynamics and how these dynamics have evolved in Bangladesh to demonstrate how seasonal issues between the BIHS 2011/12 baseline and 2018/19 endline were minimized. Historically, September to October has been the worst season in terms of food insecurity, caused by high rice prices and a lack of employment opportunities before the aman rice harvest in early November, which exacerbate this lean season's severity. In contrast, mid-November to February represents the peak season when rice price falls, and employment opportunities increase due to *aman* rice harvest and boro rice, wheat, and other winter season crop plantations. The second and relatively less severe lean season occurs from March to April, before boro rice harvest, when rice price tends to be high.

However, the severity of the two lean seasons has reduced remarkably in recent years. Monthly rice prices displayed a greater degree of stability over the last two decades compared with the 1980s and 1990s, which significantly lessened the severity of both lean seasons. Two major factors likely account for the increased price stability. First, the phenomenal growth of irrigated boro rice in the dry season (which increased the share of boro rice in total production from about 20 percent in the early 1980s to about 55 percent in the mid-2010s) increased the stability of production and resulted in a more even distribution of market arrivals of rice. The increase in the share of boro in total rice production has eliminated the steep seasonal rise in prices. Second, improved infrastructure and enhanced capacity of

the government and farmers to undertake effective resilience measures may have reduced the magnitude of rice production shortfalls caused by floods and other natural disasters, thus contributing to improved supply stability.

Moreover, rapid growth in micro, small and medium enterprises has been generating year-round employment and income in both urban and rural areas, and thus, contributing to consumption-smoothing. The share of agriculture in Bangladesh's gross domestic product declined from 30.5 percent in 1990 to 12.7 percent in 2019, and the share of non-farm employment has now surpassed that of farm employment. Rural real wages have risen significantly since the early 2000s as more workers have shifted to the formal sector and other non-farm jobs. Labor in rural areas has become scarcer, bidding up real wages, and thereby enhancing total labor earnings and food security.[13]

Seasonality has both spatial and temporal aspects. Spatial variations in seasonality among regions within a country may be a source of biased estimates. For example, the September to October lean season is most relevant for the northwestern region of Bangladesh where the poverty rate is the highest. In contrast, the months of September and October are generally not considered as the lean season in the southern part of the ZOI, where aquaculture generates higher incomes than rice cultivation.

Setting longer recall periods in survey instruments can ameliorate the impact of seasonality. In the BIHS baseline and endline surveys, agricultural production data collection used a fixed recall period of 12 months—between December 1 and November 30—for both baseline and endline surveys, which eliminated seasonal bias in the data. Moreover, the non-food expenditure module used recall periods ranging from one to 12 months, reducing seasonal bias in consumption expenditures used as a proxy for income.

Considering the timing of the ZOI baseline and endline surveys, significantly lessened severity of the traditional lean seasons, consumption-smoothing effects of rural non-farm employment generation, spatial variations in seasonality, and the length of recall periods in survey instruments, IFPRI researchers conclude that seasonality does not bias the comparison of BIHS ZOI baseline and endline survey estimates of indicators in this report.

However, the timing of the BDHS baseline and endline surveys raises potential seasonality issues. The BDHS 2011 (baseline) was administered between July and December 2011 and the BDHS 2017/2018 (endline) was conducted from October 2017 to March 2018. In Bangladesh, June-September is the monsoon or rainy season, and October-March is the dry season. Studies in Bangladesh show that the prevalence of wasting (low weight-for-height) in children were significantly higher during the monsoon season compared with the dry season.[14] Lost employment due to weather, reduced food supplies, diseases such as diarrhea, etc. have been identified as pathways through which seasonality affect the health and economic status of individuals and households.[15] Since the BDHS 2011 baseline overlapped with the rainy season, whereas the BDHS 2017/2018 endline was during the dry season, this may have increased the baseline prevalence of wasting, hence overestimating the change in wasting from baseline to endline.

[13] Zhang et al. (2014)
[14] Brown et al. (1982); Hillbruner and Egan (2008)
[15] Devereux et al. (2012); Hillbruner and Egan (2008)

Table 2.1.5: Season in which Data Collection Took Place for Feed the Future Phase One Baseline and Endline and Secondary Data Sources, by Indicator

Indicator	Season of data collection	
	Baseline	Endline
Daily per capita expenditures (2010 USD)	Mostly non-lean season. BIHS ZOI Survey, Oct 28-Nov 30, 2011	Non-lean season. BIHS ZOI Survey, Nov 11, 2018-Feb 6, 2019
Prevalence of poverty: Percent of people living on less than $1.25/day (2005 PPP)	Mostly non-lean season. BIHS ZOI Survey, Oct 28-Nov 30, 2011	Non-lean season. BIHS ZOI Survey, Nov 11, 2018-Feb 6, 2019
Depth of poverty: Mean percentage shortfall of the poor relative to the $1.25/day (2005 PPP) poverty line	Mostly non-lean season. BIHS ZOI Survey, Oct 28-Nov 30, 2011	Non-lean season. BIHS ZOI Survey, Nov 11, 2018-Feb 6, 2019
Abbreviated Women's Empowerment in Agriculture Index	Mostly non-lean season. BIHS ZOI Survey, Oct 28-Nov 30, 2011	Non-lean season. BIHS ZOI Survey, Nov 11, 2018-Feb 6, 2019
Prevalence of moderate and severe hunger	Mostly non-lean season. BIHS ZOI Survey, Oct 28-Nov 30, 2011	Non-lean season. BIHS ZOI Survey, Nov 11, 2018-Feb 6, 2019
Prevalence of exclusive breastfeeding of children under 6 months of age	Mostly non-lean season. BDHS Survey, July-Dec 2011	Mostly non-lean season. BDHS Survey, Oct 2017-March 2018
Percent of children 6-23 months of age receiving a minimum acceptable diet	Mostly non-lean season. BDHS Survey, July-Dec 2011	Mostly non-lean season. BDHS Survey, Oct 2017-March, 2018
Prevalence of women of reproductive age consuming a diet of minimum diversity	Mostly non-lean season. BIHS ZOI Survey, Oct 28, 2011-March 15, 2012	Non-lean season. BIHS ZOI Survey, Nov 11, 2018-Feb 6, 2019
Prevalence of stunted children under 5 years of age	Mostly non-lean season. BDHS Survey, July-Dec 2011	Mostly non-lean season. BDHS Survey, Oct 2017-March 2018
Prevalence of wasted children under 5 years of age	Mostly non-lean season. BDHS Survey, July-Dec 2011	Mostly non-lean season. BDHS Survey, Oct 2017-March 2018
Prevalence of underweight children under 5 years of age	Mostly non-lean season. BDHS Survey, July-Dec 2011	Mostly non-lean season. BDHS Survey, Oct 2017-March 2018
Prevalence of underweight women of reproductive age	Mostly non-lean season. BDHS Survey, July-Dec 2011	Mostly non-lean season. BDHS Survey, Oct 2017-March 2018

PPP=purchasing power parity

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019; Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

2.2 Measures and reporting conventions used throughout this report

2.2.1 Standard disaggregates

A standard set of disaggregate variables is used in tables throughout this report. This section lists each of the standard disaggregate variables and defines how each variable is calculated.

These variables are coded consistently; however, because data have been drawn from the Feed the Future Phase One 2011/2012 baseline and 2018/2019 endline ZOI Surveys, BDHS 2011 and 2017/2018, and HIES 2010 and 2016, there are minor cross-source variations in the data used to derive the standard disaggregates. These are noted in the variable descriptions below. The data source used for each Feed the Future indicator is also the data source used to produce the disaggregate variables presented in the associated descriptive tables.

Age in years

Data on respondents' age in years are collected in the household roster. For women 15-49 years of age and children under 5 years of age, more detailed age data are collected in subsequent questionnaire modules to confirm eligibility to respond to the module questions; these more detailed age data are used when available. Age is generally presented in the tables in 5-year age groups.

Age in months

The age of children in months is collected in the child nutrition survey module rather than in the household roster so that the children's parent or primary caregiver can be prompted to provide the most accurate age possible. Children's age in months is presented by age categories for the children's dietary intake and anthropometry tables. For example, the minimum acceptable diet (MAD) tables (**Tables 6.3.2** and **6.3.3**) present children's age disaggregated in 6-month age groups as follows: 6-11 months, 12-17 months, and 18-23 months. For the children's anthropometry tables (**Tables 7.2.1**, **7.2.2**, **7.2.3,** and **7.2.4**), which present the prevalence of stunting, wasting, and underweight for all children under 5 years of age, children's age is disaggregated into 12-month age groups as follows: 0-11 months, 12-23 months, 24-35 months, 36-47 months, and 48-59 months.

Sex

Sex—either male or female—is a standard disaggregate for the tables presenting children's indicators, (for example, children's dietary intake [**Tables 6.3.1** and **6.3.2]** and children's anthropometry [**Tables 7.2.1, 7.2.2, 7.2.3,** and **7.2.4**]). The sex of household members is collected in the household roster.

Educational attainment (household)

Household educational attainment reflects the highest level of education attained by any member of the household, as reported in the household roster. This variable is used in tables that present household-level data and comprises five categories: no education (households with no member who has received formal education); less than primary (households with at least one member who has received formal schooling, but with no member who has completed primary); completed primary (households with at least one member who has completed primary, but with no member who has completed secondary); completed secondary (households with at least one member who has completed secondary, but with no member who has completed any higher formal education); and higher (households with at least one member who has completed formal education higher than secondary—even if only one year). Households are categorized in only one of the five categories. This variable is calculated using data on the education of household members, which are collected in the household roster.

Educational attainment (individual)

Educational attainment at the individual level reflects the highest level of education attained by individual household members, as reported in the household roster. This variable comprises five categories: no education (those who have not received any formal education); less than primary (those who have received formal education but who have not completed primary); completed primary (those who have completed primary but who have not completed secondary); completed secondary (those who have completed secondary but who have not completed any higher formal education); and higher (those who have completed formal education higher than secondary—even if only for one year). This variable is

calculated using data on the education of household members, which are collected in the household roster.

Gendered household type

Feed the Future disaggregates household-level indicators by gendered household type—that is: (1) households that include both male and female adults, 18 years of age or older; (2) households that include female adults, but no male adults; (3) households that include male adults, but no female adults; and (4) households with only members under 18 years of age (households with children only and no adult members). This approach to conceptualizing household type is distinct from the standard "head of household" approach, which is embedded with presumptions about household gender dynamics and may perpetuate existing social inequalities and prioritization of household responsibilities that may be detrimental to women. This variable is calculated using data on the age and sex of household members, which are collected in the household roster.

Household hunger

The household hunger disaggregate uses the categories created for the Household Hunger Scale indicator, which characterizes households according to three categories of hunger severity: little to no household hunger, moderate household hunger, and severe household hunger. The indicator is described in greater detail in Section 6.1 of this report. Household hunger is used as a disaggregate for several household-level indicators, as well as some individual-level nutrition indicators. This variable is calculated using data collected in Module 3, *Food security and resilience*.

Poverty status

As described in greater detail in Chapter 4 of this report, poverty status characterizes households as poor if household members live below the poverty threshold—that is, on less than $1.25 per person per day at 2005 PPP, or as non-poor if household members live at or above the poverty threshold—that is, on $1.25 or more per person per day (2005 PPP). Poverty status is calculated using data collected in Module 8, *Household consumption expenditure*. Poverty status is used as a disaggregate for many household-level indicators, as well as some individual-level nutrition indicators.

2.2.2 Reporting conventions

The Feed the Future Bangladesh Phase One ZOI Survey endline assessment is primarily comparative in nature. This section provides an overview of the conventions used to report these results:

- In the tables throughout this report, weighted point estimates and unweighted sample sizes are presented.
- Most estimates are shown to one decimal place except for (1) per capita expenditures, where consumption shortfall is expressed in USD using two decimal places; and (2) estimates of Abbreviated Women's Empowerment in Agriculture Index (A-WEAI), five domains of empowerment (5DE), and Gender Parity Index (GPI) indicators, which are also shown to two decimal places. Unweighted sample sizes in all tables and the population estimates in **Table 1.2.1** and **Table 1.2.2** are shown as whole numbers.

- The absolute and percentage changes presented are based on unrounded estimates. This is because rounded figures may over- or under-report changes.
- Values in the tables are suppressed when the unweighted sample size is insufficient to calculate a reliable point estimate (n<30); this is denoted using the symbol "^" in the designated row and an explanatory footnote.
- Tests of difference are performed to determine whether there is a difference between the baseline and endline estimates. The 95 percent confidence intervals (CIs) for the baseline and endline estimates, the difference between endline and baseline estimates, and the associated p-value are reported in indicator tables throughout the report except for the average consumption shortfall, A-WEAI time allocation, HHS, and nutritional status indicator tables. Due to the amount of information in these tables, only the estimates and sample sizes are presented, with asterisks to the right of the endline estimate to designate statistically significant differences (* indicates a p<0.05, ** indicates a p<0.01, and *** indicates a p<0.001) and n/s for statistically insignificant. The full endline-baseline difference results are presented in appendix tables.
- Individual-level indicators and disaggregates generated using individual-level data (for example, household educational attainment and gendered household type) are calculated for de jure household members. All tables include a footnote or table note that indicates which subset of household members was used. If a table contains individual-level indicators, the disaggregates used reflect the same subset of household members used to calculate the indicator. For example, the women's underweight indicator is calculated for de jure women of reproductive age, so the gendered household type disaggregate in the table is also calculated for de jure household members.
- For indicators that cannot be a negative number (for example, proportions), any lower value of a 95% confidence interval that were negative values were replaced by zero.

Analyses are performed in Stata 15 using '*svy*' commands to handle features of data collected by complex survey designs, including sampling weights, cluster sampling, and stratification.

3. POPULATION IN THE ZONE OF INFLUENCE

Chapter 3 describes the background characteristics of the Phase One ZOI population using data from the Feed the Future Bangladesh Phase One baseline and endline ZOI Surveys, and documents changes in demographic and household characteristics that occurred between the two surveys. Because changes in these characteristics may influence changes in the Feed the Future Phase One ZOI indicators, results of tests of statistical difference between baseline and endline are provided. Section 3.1 presents demographic results; Section 3.2 presents education results; Section 3.3 presents dwelling characteristic and living condition results; and Section 3.4 presents water, sanitation, and hygiene results.

3.1 Demographics

Table 3.1.1 presents demographic characteristics of households in the Phase One ZOI, comparing estimates at 2011/2012 baseline and 2018/2019 endline.[16] Estimates include the average household size—based on de jure household members, as well as the average numbers of de jure female adults, male adults, youth, women of reproductive age (15-49 years), and children in the household. Household education, defined as the highest level of education attained of any de jure member of the household, is also presented in this table, as is the percentage of de jure adults by sex.

From 2011/2012 baseline to 2018/2019 endline, there was a drop in the mean number of children ages 5 to 17 in ZOI households, and a rise in the mean number of adult female household members—both statistically significant at the 1 percent level. While there were some changes in ZOI household characteristics from 2011/2012 baseline to 2018/2019 endline, most changes in household characteristics were found to be statistically insignificant, such as the gendered composition of ZOI households. The results show that the mean household size decreased negligibly from 4.1 to 4.0 household members (significant at the 5 percent level), and the mean number of children under 2 years of age and under 5 years of age declined slightly (both significant at the 1 percent level).

There is an encouraging trend in household educational attainment in the Bangladesh ZOI. From 2011/2012 baseline to 2018/2019 endline, the percentage of de jure household members in ZOI households attaining secondary-level education or higher increased by 39.8 percent—from 11.3 percent in 2011/2012 to 15.8 percent in 2018/2019. There was an even steeper rise (54.1 percent) in achievement higher than secondary education—from 10.4 percent to 16.1 percent.

[16] Table A1.3.1 in Appendix 1 presents household demographic characteristics—the same as presented in Table 3.1.1—by gendered household type at endline.

Table 3.1.1: Comparison of Household Demographic Characteristics in the Phase One ZOI, Feed the Future Phase One Baseline and Endline ZOI Surveys

	Baseline (2011/2012)			Endline (2018/2019)				p-value	
Characteristic	Est.	95% CI	n[a]	Est.	95% CI	n[a]	Diff.	[b]	Sig.[c]
Mean household size[d]	4.1	4.0 – 4.2	2,040	4.0	3.9 – 4.1	2,064	-0.1	0.032	*
Mean number of children under 2 years of age[d]	0.2	0.1 – 0.2	2,040	0.1	0.1 – 0.1	2,064	0.0	0.005	**
Mean number of children under 5 years of age[d]	0.4	0.4 – 0.4	2,040	0.3	0.3 – 0.4	2,064	-0.1	0.005	**
Mean number of children 5 years of age or older (5-17 years)[d]	1.2	1.1 – 1.3	2,040	1.1	1.1 – 1.2	2,064	-0.1	0.169	n/s
Mean number of youth (15-29 years)[d]	1.0	0.9 – 1.0	2,040	0.9	0.8 – 0.9	2,064	-0.1	0.001	**
Mean number of women of reproductive age (15-49 years)[d]	1.1	1.1 – 1.1	2,040	1.1	1.1 – 1.1	2,064	0.0	0.828	n/s
Mean number of adult male household members[d,e]	1.2	1.1 – 1.2	2,040	1.1	1.1 – 1.2	2,064	0.0	0.27	n/s
Mean number of adult female household members[d,e]	1.4	1.3 – 1.4	2,040	1.4	1.3 – 1.4	2,064	0.0	0.228	n/s
Percent of adults who are male (%)[d,e]	43.0	41.8 – 44.2	2,040	41.5	40.1 – 42.9	2,064	-1.5	0.125	n/s
Percent of adults who are female (%)[d,e]	57.0	55.8 – 58.2	2,040	58.5	57.1 – 59.9	2,064	1.5	0.138	n/s
Highest household educational attainment (%)[f]									
No education	6.7	5.4 – 8.1	2,040	5.9	4.7 – 7.1	2,064	-0.8	0.374	n/s
Less than primary	18.4	16.2 – 20.6	2,040	10.0	8.0 – 12.0	2,064	-8.4	0.000	***
Completed primary	53.2	50.9 – 55.5	2,040	52.2	49.7 – 54.7	2,064	-1.0	0.564	n/s
Completed secondary	11.3	9.8 – 12.8	2,040	15.8	14.0 – 17.6	2,064	4.5	0.000	***
Higher	10.4	8.4 – 12.5	2,040	16.1	13.9 – 18.2	2,064	5.7	0.000	***

CI=confidence interval; Est.=estimate

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, the sum of disaggregate sample sizes may not equal the overall sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[d] Disaggregates based on individual household members are calculated using de jure household members.

[e] Feed the Future defines an adult as an individual 18 years of age or older. Females and males 15-17 years of age are of reproductive age but are not considered adults by this definition.

Note: Estimates are sample-weighted; numbers of observations are unweighted.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table 3.1.2 and **Table 3.1.3** present characteristics of primary adult female and male decision-makers in the Phase One ZOI, comparing estimates at baseline and at endline.[17] Primary adult decision-makers are household members who are 18 years or older and who self-identify as the primary adult male or primary adult female responsible for both social and economic decision-making in the household. When both exist in a single household, primary adult female and male decision-makers are typically, but not necessarily, husband and wife. **Table 3.1.2** presents characteristics of primary adult female decision-makers, and **Table 3.1.3** presents the same for primary adult male decision-makers. The characteristics include age group, marital status, educational attainment, and participation in economic activities.

Since the 2011/2012 baseline and 2018/2019 endline are panel surveys, which collect data on the same households over time, the data reflect the expected trend of primary adult female decision-makers growing older between baseline and endline.

There were slight improvements in educational attainment among primary adult female decision-makers: the percentage with no education decreased from 39.5 percent to 33.8 percent, whereas the proportions of those who completed primary, secondary, and higher all increased.

There were substantial changes in women's economic engagement. The percentage of primary adult female decision-makers who participated in some form of economic activity increased from 75.5 percent to 93.8 percent. Interestingly, this increased participation is exclusively focused on farm-related activities (67.6 percent to 91.4 percent); conversely, participation in non-farm and wage/salaried work, both of which typically require women to work away from their homes, decreased significantly during the same timeframe (by 30 percent and 50 percent, respectively).

Overall, these results suggest that women are becoming more educated and continuing to emerge as robust actors in Bangladesh's economy, albeit mostly on the production node of the food value chain.

[17] Table A1.3.2 in Appendix 1 presents a comparison of primary adult female decision-makers and primary adult male decision-makers at endline.

Table 3.1.2: Comparison of Characteristics of Primary Adult Female Decision-makers in the Phase One ZOI, Feed the Future Phase One Baseline and Endline ZOI Surveys

Characteristic	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[b]	Sig.[c]
	%	95% CI	n[a]	%	95% CI	n[a]			
Age									
18-24	12.4	10.6 – 14.2	2,031	4.4	3.5 – 5.3	2,047	-8.0	0.000	***
25-29	16.1	14.6 – 17.6	2,031	12.6	10.8 – 14.5	2,047	-3.5	0.005	**
30-39	28.6	26.4 – 30.8	2,031	30.6	28.4 – 32.7	2,047	1.9	0.213	n/s
40-49	23.4	21.5 – 25.3	2,031	27.3	25.5 – 29.2	2,047	3.9	0.004	**
50-59	12.2	10.7 – 13.6	2,031	15.6	14.0 – 17.2	2,047	3.4	0.003	**
60+	7.3	6.1 – 8.6	2,031	9.5	8.0 – 10.9	2,047	2.1	0.031	*
Marital status									
Married	92.4	91.0 – 93.7	2,031	89.5	87.9 – 91.0	2,047	-2.9	0.006	**
Living in a consensual union[†]	0.0	n/a	2,031	0.0	n/a	2,047	0.0	n/a	n/a
Widowed	6.4	5.2 – 7.5	2,031	9.4	7.9 – 10.8	2,047	3.0	0.002	**
Divorced or separated	1.0	0.5 – 1.6	2,031	1.1	0.6 – 1.6	2,047	0.1	0.829	n/s
Never married or in a union	0.3	0.0 – 0.5	2,031	0.1	0.0 – 0.2	2,047	-0.2	0.134	n/s
Education									
No education	39.5	36.2 – 42.8	2,031	33.8	30.7 – 37.0	2,047	-5.6	0.017	n/s
Less than primary	17.2	15.3 – 19.2	2,031	15.5	13.8 – 17.3	2,047	-1.7	0.209	n/s
Completed primary	37.5	34.7 – 40.4	2,031	43.5	40.6 – 46.4	2,047	5.9	0.005	**
Completed secondary	3.9	2.9 – 4.9	2,031	4.3	3.2 – 5.5	2,047	0.4	0.564	n/s
Higher	1.9	1.2 – 2.6	2,031	2.8	2.0 – 3.6	2,047	0.9	0.089	n/s
Economic activity[d]									
Participates in some form of economic activity	75.5	71.9 – 79.0	2,031	93.8	92.2 – 95.4	2,040	18.3	0.000	***
Participation in economic activity by type[e,f]									
Farm	67.6	64.0 – 71.3	2,031	91.4	89.5 – 93.4	2,040	23.8	0.000	***
Non-farm	19.2	16.0 – 22.3	2,031	13.6	11.5 – 15.8	2,040	-5.5	0.005	**
Wage/salaried	23.7	19.8 – 27.6	2,031	11.8	9.7 – 14.0	2,040	-11.8	0.000	***

CI=confidence interval; Diff.=difference; n/a= not applicable; n/s=not significant

^ Results not statistically reliable, n<30

[†] Select 95% CIs have been reported as 'n/a' when estimates are 0.0; therefore, a 95% CI, nor a p-value or significance test can be generated.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, the sum of disaggregate sample sizes may not equal the overall sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.
[d] Both paid and unpaid types of economic activity are included. Domestic work, such as caring for children and the elderly or cooking and cleaning, is not included.
[e] Farm work includes food crop farming, cash crop farming, livestock raising, or fishing/fishpond culture; non-farm work includes running small businesses or self-employment; and wage/salaried employment includes both agriculture and non-agriculture-based work that is salaried. Percentages do not add up to 100 percent because individuals can engage in more than one type of economic activity.
[f] Participation in economic activity of primary adult female decision-makers at endline was available for 2,040 women out of 2,047 women.
Notes:
Estimates are based on primary adult female decision-makers who are de jure household members.
Estimates are sample-weighted; numbers of observations are unweighted.
Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Since the BIHS is a panel survey that tracks the same households over time, primary adult male decision-makers grew older between the two survey rounds, as expected. 92.4 percent of primary female decision-makers were married at 2011/2012 baseline compared with 89.5 percent at 2018/2019 endline—a difference that is statistically significant at the 1 percent level. The proportion of primary female decision-makers who are widowed increased by 3 percentage points (47 percent) between 2011/2012 baseline and 2018/2019 endline, and this difference is statistically significant at the 1 percent level. These changes likely reflect the aging of the household members between the two panel rounds.

Educational attainment of primary adult male decision-makers has improved marginally between 2011/2012 baseline and 2018/2019 endline; however, the percentage of primary adult male decision-makers who have no education remains relatively high at 37.8 percent. Although women have higher primary education attainment rates across both survey rounds, a gender disparity in secondary education attainment and higher remains, with men outpacing women across the two survey rounds.

Men's participation in some form of economic activity increased from 94.6 percent at 2011/2012 baseline to 97.4 percent at 2018/2019 endline—an increase statistically significant at the 1 percent level. Participation in farm activities grew among primary adult female and male decision-makers, which were statistically significant at the 0.1 percent and 1 percent levels, respectively. While there were statistically significant reductions in women's participation in non-farm and wage/salaried work between 2011/2012 baseline and 2018/2019 endline, men's participation in these areas remained unchanged.

Table 3.1.3: Comparison of Characteristics of Primary Adult Male Decision-makers in the Phase One ZOI, Feed the Future Phase One Baseline and Endline ZOI Surveys

Characteristic	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[b]	Sig.[c]
	%	95% CI	n[a]	%	95% CI	n[a]			
Age									
18-24	4.9	3.7 – 6.0	1,719	3.3	2.4 – 4.2	1,749	-1.5	0.038	*
25-29	8.4	6.9 – 9.8	1,719	5.2	4.1 – 6.3	1,749	-3.2	0.001	**
30-39	23.4	21.5 – 25.3	1,719	20.2	18.0 – 22.4	1,749	-3.2	0.030	*
40-49	25.7	23.5 – 27.9	1,719	27.9	25.7 – 30.0	1,749	2.2	0.159	n/s
50-59	17.0	15.3 – 18.8	1,719	21.8	19.8 – 23.8	1,749	4.7	0.001	**
60+	20.7	18.3 – 23.1	1,719	21.6	19.6 – 23.7	1,749	1.0	0.558	n/s
Marital status									
Married	94.9	93.8 – 96.0	1,719	93.8	92.6 – 95.0	1,749	-1.1	0.209	n/s
Living in a consensual union[†]	0.0	n/a	1,719	0.0	n/a	1,749	0.0	n/a	n/a
Widowed	1.0	0.5 – 1.5	1,719	1.9	1.2 – 2.5	1,749	0.9	0.041	*
Divorced or separated	0.1	0.0 – 0.2	1,719	0.2	0.0 – 0.4	1,749	0.1	0.406	n/s
Never married or in a union	4.0	3.0 – 5.1	1,719	4.1	3.1 – 5.1	1,749	0.1	0.904	n/s
Education									
No education	41.0	37.4 – 44.7	1,719	37.8	34.3 – 41.3	1,749	-3.2	0.212	n/s
Less than primary	15.5	13.5 – 17.4	1,719	14.5	12.7 – 16.3	1,749	-1.0	0.471	n/s
Completed primary	33.0	30.3 – 35.7	1,719	34.4	31.6 – 37.3	1,749	1.4	0.473	n/s
Completed secondary	5.5	4.5 – 6.6	1,719	6.1	4.8 – 7.3	1,749	0.5	0.515	n/s
Higher	5.0	3.6 – 6.4	1,719	7.2	5.6 – 8.8	1,749	2.2	0.038	*
Economic activity[d]									
Participates in some form of economic activity	94.6	93.0 – 96.2	1,719	97.4	96.5 – 98.2	1,740	2.8	0.003	**
Participation in economic activity by type[e]									
Farm	81.7	78.8 – 84.7	1,719	88.4	85.8 – 90.9	1,740	6.6	0.001	**
Non-farm	44.7	41.2 – 48.2	1,719	44.7	41.0 – 48.4	1,740	0.0	0.997	n/s
Wage/salaried	47.4	43.7 – 51.2	1,719	45.8	42.5 – 49.2	1,740	-1.6	0.539	n/s

CI=confidence interval; Diff.=difference; n/a=not applicable; n/s=not significant

^ Results not statistically reliable, n<30

[†] Select 95% CIs have been reported as 'n/a' when estimates are 0.0; therefore, a 95% CI, nor a p-value or significance test can be generated.

^ Results not statistically reliable, n<30

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, the sum of disaggregate sample sizes may not equal the overall sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[d] Both paid and unpaid types of economic activity are included. Domestic work, such as caring for children and the elderly or cooking and cleaning, is not included.

[e] Farm work includes food crop farming, cash crop farming, livestock raising, or fishing/fishpond culture; non-farm work includes running small businesses or self-employment; and wage/salaried employment includes both agriculture and non-agriculture-based work that is salaried. Percentages do not add up to 100 percent because individuals can engage in more than one type of economic activity.
[f] Data on participation in economic activity of primary adult male decision-makers at endline were available for 1,740 men out of 1,749 men.
Notes:
Estimates are based on primary adult male decision-makers who are de jure household members.
Estimates are sample-weighted; numbers of observations are unweighted.
Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

3.2 Education

The tables in Section 3.2 present school attendance and educational attainment in the Phase One ZOI, comparing estimates at baseline and at endline. **Table 3.2.1** presents the percentage of all de jure household members between 5 and 24 years of age who were attending school by age category at the time of the baseline and endline ZOI Surveys. **Table 3.2.2** presents the percentage of all de jure household members 10 years of age or older who completed primary education by age category. **Table 3.2.3** presents the percent distribution of all de jure household members 10 years of age or older by highest educational attainment. All results are presented in total and by sex. **Table 3.2.1** and **Table 3.2.2** also include female-to-male ratios.

Bangladesh's school year takes place from January to December for primary and secondary education. As the ZOI endline survey was conducted from November to February, this means that the ZOI data collection overlapped with the school year.

Table 3.2.1 shows the percentage of household members attending school at 2011/2012 baseline and 2018/2019 endline, disaggregated by age and sex. There are more school-going household members at the endline compared with baseline across all age groups and gender. School attendance among household members ages 5-9 increased by more than 10 percentage points between the two survey rounds. When school attendance is disaggregated by gender, girls ages 5-9 in primary education and ages 10-14 in secondary education outperformed boys at baseline and endline. For ages 10-14, the rate of increase in school attendance was higher for girls than boys (3.3 percentage points versus 2.4 percentage points), although this difference is not statistically significant.

Table 3.2.1: Comparison of School Attendance at Time of Survey among Children and Youth 5-24 Years of Age in the Phase One ZOI, in Total and by Age and Sex, Feed the Future Phase One Baseline and Endline ZOI Surveys

Sex and age (years)	Baseline (2011/2012)			Endline (2018/2019)					
	%	95% CI	n	%	95% CI	n	Diff.	p-value[a]	Sig.[b]
Total									
5-9	73.0	69.2 – 76.9	1,002	83.2	80.3 – 86.2	847	10.2	0.000	***
10-14	91.0	88.9 – 93.1	1,063	93.9	92.3 – 95.5	911	2.9	0.030	*
15-19	54.2	49.6 – 58.8	663	67.8	63.4 – 72.1	775	13.6	0.000	***
20-24	13.7	10.0 – 17.3	622	28.9	24.9 – 32.8	551	15.2	0.000	***
Female									
5-9	74.7	70.4 – 78.9	502	85.2	81.4 – 89.1	431	10.6	0.000	***
10-14	94.0	91.5 – 96.5	509	97.3	95.8 – 98.8	448	3.3	0.029	*
15-19	48.2	42.1 – 54.2	321	66.7	60.8 – 72.5	390	18.5	0.000	***
20-24	11.5	7.2 – 15.8	374	20.7	15.3 – 26.2	306	9.2	0.010	*
Male									
5-9	71.4	65.9 – 76.9	500	81.2	76.8 – 85.5	416	9.8	0.007	**
10-14	88.1	84.5 – 91.7	554	90.5	87.5 – 93.5	463	2.4	0.312	n/s
15-19	59.9	53.5 – 66.2	342	68.8	62.9 – 74.6	385	8.9	0.046	*
20-24	16.7	10.9 – 22.4	248	37.5	31.1 – 43.8	245	20.8	0.000	***
Female- Male ratio									
5-9	1.1	n/a	n/a	1.0	n/a	n/a	-0.1	n/a	n/a
10-14	1.1	n/a	n/a	1.1	n/a	n/a	0.0	n/a	n/a
15-19	0.1	n/a	n/a	0.9	n/a	n/a	0.1	n/a	n/a
20-24	0.7	n/a	n/a	0.5	n/a	n/a	-0.2	n/a	n/a

CI=confidence interval; Diff.=difference; n/a= not applicable; n/s=not significant

[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

In Bangladesh, primary education is defined as five years of schooling (grades 1-5) beginning at age six. A student needs to pass the first national exam and receive a Primary Education Certificate to have completed primary education.

Table 3.2.2 presents statistics on the percentage of individuals, 10 years of age or older, who completed primary education at baseline and endline. Bangladesh's changes in primary educational attainment by successive age groups points to the country's long-term trend in educational achievement. The results demonstrate improved primary educational attainment across gender and age groups. Primary educational attainment among individuals ages 10-14 increased from 36.5 percent to 57.6 percent, with higher attainment among females than males at the 2018/2019 endline (60.9 percent versus 54.2 percent). However, it is important to note that due to these being panel surveys, an increase in primary education attainment in subsequent age groups (especially in the higher age groups) is partly attributable to the cohort aging through the sample between 2011/2012 baseline and 2018/2019 endline.

Table 3.2.2: Comparison of Completion of Primary Education among Individuals 10 Years of Age or Older in the Phase One ZOI, in Total and by Age and Sex, Feed the Future Phase One Baseline and Endline ZOI Surveys

Sex and age (years)	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[a]	Sig.[b]
	%	95% CI	n	%	95% CI	n			
Total									
10-14	36.5	33.4 – 39.5	1,063	57.6	53.6 – 61.6	911	21.1	0.000	***
15-19	82.5	78.9 – 86.1	663	90.9	88.6 – 93.2	775	8.4	0.000	***
20-24	79.6	75.8 – 83.5	622	87.3	83.5 – 91.1	551	7.7	0.006	**
25-29	66.3	61.6 – 71.0	670	77.4	72.9 – 81.9	590	11.1	0.001	**
30-34	55.3	49.6 – 61.0	518	70.9	66.1 – 75.7	631	15.6	0.000	***
35-39	45.4	40.2 – 50.5	584	58.5	52.5 – 64.5	490	13.1	0.001	**
40-44	35.9	31.4 – 40.4	504	48.1	43.1 – 53.2	564	12.2	0.000	***
45-49	30.5	25.7 – 35.4	479	41.2	36.3 – 46.0	483	10.6	0.003	**
50-54	28.5	23.5 – 33.5	360	34.0	28.5 – 39.5	453	5.5	0.153	n/s
55-59	31.8	26.1 – 37.6	281	31.8	26.3 – 37.4	355	0.0	0.995	n/s
60+	21.9	18.3 – 25.6	822	25.5	21.6 – 29.5	901	3.6	0.195	n/s
Female									
10-14	40.4	36.1 – 44.7	509	60.9	55.2 – 66.6	448	20.5	0.000	***
15-19	88.3	84.1 – 92.5	321	94.9	92.6 – 97.2	390	6.6	0.008	**
20-24	82.6	77.9 – 87.2	374	92.8	89.4 – 96.2	306	10.2	0.001	**
25-29	66.8	61.1 – 72.5	392	78.7	73.2 – 84.2	365	11.9	0.003	**
30-34	56.7	50.2 – 63.2	299	74.0	68.5 – 79.4	367	17.2	0.000	***
35-39	39.9	33.7 – 46.0	310	59.6	52.6 – 66.6	290	19.7	0.000	***
40-44	29.1	23.3 – 34.9	274	44.8	38.4 – 51.2	307	15.7	0.000	***
45-49	24.1	18.2 – 30.0	243	31.5	25.3 – 37.7	261	7.4	0. 096	n/s
50-54	18.6	13.1 – 24.2	191	27.7	20.8 – 34.5	232	9.0	0.051	n/s
55-59	13.6	8.0 – 19.1	135	23.5	16.1 – 30.9	184	9.9	0.038	*
60+	10.1	6.5 – 13.8	378	12.6	8.9 –16.3	433	2.4	0.358	n/s
Male									
10-14	32.7	28.5 – 37.0	554	54.2	48.7 – 59.6	463	21.4	0.000	***
15-19	77.1	71.7 – 82.4	342	87.2	83.2 – 91.1	385	10.1	0.004	*
20-24	75.5	69.7 – 81.2	248	81.5	75.6 – 87.4	245	6.0	0.153	n/s
25-29	65.5	59.1 – 72.0	278	74.8	68.4 – 81.2	225	9.3	0.004	*
30-34	53.4	45.1 – 61.8	219	66.6	59.6 – 73.5	264	13.1	0.017	**
35-39	51.3	44.6 – 58.1	274	56.9	48.2 – 65.6	200	5.6	0.320	n/s
40-44	43.0	36.2 – 49.8	230	51.4	44.8 – 58.0	257	8.4	0.083	n/s
45-49	36.6	29.4 – 43.7	236	50.6	44.1 – 57.1	222	14.0	0.005	*
50-54	39.9	31.4 – 48.3	169	40.2	32.4 – 48.0	221	0.3	0.954	n/s
55-59	47.1	38.7 – 55.5	146	41.3	33.3 – 49.3	171	-5.8	0.327	n/s
60+	31.8	26.6 – 37.1	444	37.9	32.1 – 43.7	468	6.1	0.127	n/s
Female-male ratio									
10-14	1.2	n/a	n/a	1.2	n/a	n/a	0.0	n/a	n/a
15-19	1.1	n/a	n/a	1.1	n/a	n/a	0.0	n/a	n/a
20-24	1.1	n/a	n/a	1.2	n/a	n/a	0.1	n/a	n/a

Sex and age (years)	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[a]	Sig.[b]
	%	95% CI	n	%	95% CI	n			
25-29	1.0	n/a	n/a	1.1	n/a	n/a	0.1	n/a	n/a
30-34	1.1	n/a	n/a	1.1	n/a	n/a	0.0	n/a	n/a
35-39	0.8	n/a	n/a	1.0	n/a	n/a	0.2	n/a	n/a
40-44	0.7	n/a	n/a	0.9	n/a	n/a	0.2	n/a	n/a
45-49	0.7	n/a	n/a	0.6	n/a	n/a	-0.1	n/a	n/a
50-54	0.5	n/a	n/a	0.7	n/a	n/a	0.2	n/a	n/a
55-59	0.3	n/a	n/a	0.5	n/a	n/a	0.2	n/a	n/a
60+	0.3	n/a	n/a	0.3	n/a	n/a	0.1	n/a	n/a

CI=confidence interval; Diff.=difference; n/a=not applicable; n/s=not significant
[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.
Notes:
Estimates are sample-weighted; numbers of observations are unweighted.
Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019

Table 3.2.3 presents data on household members' highest educational attainment at the baseline and endline. Household member educational attainment improved in the Bangladesh ZOI for males and females. At the 2011/2012 baseline, 29.3 percent of the Feed the Future population had no education. In 2018/2019, this dropped to 24.7 percent. The percentage of household members that had completed primary education increased from 38.5 percent to 43.9 percent. Secondary and higher educational attainment also increased between the two survey rounds.

When disaggregated by gender, female household members have slightly higher educational attainment than males up to primary school. After primary school, the pattern reverses. While females lag behind males on higher educational attainment at 2011/2012 baseline and 2018/2019 endline, the proportion of girls who completed secondary education and higher levels improved from baseline to endline (4.3 percent to 7.4 percent, and 3.2 percent to 5.2 percent, respectively). This has improved gender parity in higher educational attainment.

Table 3.2.3: Comparison of Household Member Educational Attainment in the Phase One ZOI, in Total and by Sex, Feed the Future Phase One Baseline and Endline ZOI Surveys

Sex and highest educational attainment[a]	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value [b]	Sig. [c]
	%	95% CI	n	%	95% CI	n			
Total									
No education	29.3	27.1 – 31.50	6,566	24.7	22.8 – 26.6	6,704	-4.6	0.002	**
Less than primary	22.7	21.2 – 24.2	6,566	17.2	15.8 – 18.5	6,704	-5.5	0.000	***
Completed primary	38.5	36.6 – 40.4	6,566	43.9	42.0 – 45.7	6,704	5.4	0.000	***
Completed secondary	5.4	4.6 – 6.1	6,566	7.6	6.7 – 8.5	6,704	2.2	0.000	***
Higher	4.2	3.3 – 5.1	6,566	6.7	5.7 – 7.7	6,704	2.5	0.000	***
Female									
No education	31.5	29.1 – 33.9	3,426	26.2	24.1 – 28.3	3,583	-5.3	0.001	**
Less than primary	21.5	19.8 – 23.3	3,426	16.2	14.6 – 17.8	3,583	-5.3	0.000	***
Completed primary	39.6	37.3 – 41.8	3,426	44.9	42.9 – 47.0	3,583	5.4	0.001	**
Completed secondary	4.3	3.3 – 5.2	3,426	7.4	6.2 – 8.7	3,583	3.2	0.000	***
Higher	3.2	2.3 – 4.0	3,426	5.2	4.2 – 6.2	3,583	2.0	0.003	**
Male									
No education	27.0	24.5 – 29.4	3,140	23.0	20.7 – 25.3	3,121	-4.0	0.021	*
Less than primary	23.9	22.0 – 25.8	3,140	18.2	16.5 – 20.0	3,121	-5.7	0.000	***
Completed primary	37.4	35.0 – 39.83	3,140	42.7	40.1 – 45.2	3,121	5.3	0.003	**
Completed secondary	6.5	5.6 – 7.4	3,140	7.7	6.6 – 8.9	3,121	1.2	0.104	n/s
Higher	5.2	4.1 – 6.4	3,140	8.4	7.0 – 9.7	3,121	3.1	0.001	**

CI=confidence interval; Diff.=difference

[a] Estimates include only de jure household members who are 10 years of age or older.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

Note: Estimates are sample-weighted; numbers of observations are unweighted.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

3.3 Dwelling characteristics and living conditions

Table 3.3.1 and **Table 3.3.2** present dwelling characteristics and living conditions of households in the Phase One ZOI, comparing estimates at baseline and at endline. **Table 3.3.1** presents the percentages of all households that use solid cooking fuel and that have access to electricity, the average number of de jure household members per sleeping room, and the main roof, exterior wall, and floor dwelling materials. **Table 3.3.2** presents the percentages of households that use solid cooking fuel and that have access to electricity by gendered household type and residence.

Broadly, the changes in household dwelling characteristics from 2011/2012 baseline to 2018/2019 endline suggest improved living standards and conditions in the Bangladesh ZOI. Most notably, access to electricity among ZOI households nearly doubled, from 45.3 percent to 85.1 percent (**Table 3.3.1**). These gains were observed across adult female only households (39.1 percent to 78.4 percent) and dual adult households (46.3 percent to 86.5 percent) (**Table 3.3.2**). Similarly, the mean number of people sleeping per room dipped (2.4 to 2.1), which signifies a decrease in household crowding (**Table 3.3.1**).

ZOI households increasingly opted to use more sturdy materials to build their homes at the 2018/2019 endline. The percentage of ZOI households using natural materials for different parts of their home declined, including roofs (2.7 percent to 0.8 percent), exterior wall materials (30.2 percent to 11.9 percent), and floors (88.9 percent to 76.3 percent), in favor of finished, presumably longer-lasting materials (**Table 3.3.1**).

Households with only adult males or only children are very rare in the Bangladesh context. As such, the number of male only households and children only households in the sample is too small to show valid estimates (**Table 3.3.2**).

Table 3.3.1: Comparison of Household Dwelling Characteristics in the Phase One ZOI, Feed the Future Phase One Baseline and Endline ZOI Surveys

Characteristic	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[a]	Sig.[b]
	Est.	95% CI	n	Est.	95% CI	n			
Use solid fuel for cooking (%)[c]	94.7	92.8 – 96.5	2,040	92.6	90.7 – 94.5	2,064	-2.0	0.145	n/s
Have access to electricity (%)	45.3	39.8 – 50.7	2,040	85.1	79.9 – 90.2	2,064	39.8	0.000	***
Mean number of persons per sleeping room[d,e]	2.4	2.3 – 2.5	2,040	2.1	2.1 – 2.2	2,064	-0.3	0.000	***
Household roof materials (%)[f]									
Natural	2.7	1.3 – 4.1	2,040	0.8	0.2 – 1.4	2,064	-1.9	0.019	*
Rudimentary	0.1	0.0 – 0.2	2,040	0.1	0.0 – 0.2	2,064	0.0	0.557	n/s
Finished	90.7	86.7 – 94.8	2,040	95.7	93.1 – 98.3	2,064	4.9	0.050	n/s
Other	6.5	2.8 – 10.1	2,040	3.5	1.0 – 5.9	2,064	-2.9	0.189	n/s
Household exterior wall materials (%)[g]									
Natural	30.2	26.0 – 34.3	2,040	11.9	8.8 – 15.1	2,064	-18.2	0.000	***
Rudimentary[†]	0.0	n/a	2,040	0.1	0.0 – 0.2	2,064	0.1	0.320	n/s
Finished	69.0	64.9 – 73.2	2,040	87.9	84.8 – 91.1	2,064	18.9	0.000	***
Other	0.8	0.4 – 1.3	2,040	0.1	0.0 – 0.2	2,064	-0.7	0.001	**
Household floor materials (%)[h]									
Natural	88.9	86.8 – 91.1	2,040	76.3	73.2 – 79.4	2,064	-12.6	0.000	***
Rudimentary[†,*]	0.0	n/a	2,040	0.0	n/a	2,064	0.0	n/a	n/a
Finished	11.1	8.9 – 13.2	2,040	23.7	20.6 – 26.8	2,064	12.6	0.000	***
Other[†]	0.0	n/a	2,040	0.0	n/a	2,064	0.0	n/a	n/a

CI=confidence interval; Diff.=difference; Est.=estimate; n/s=not significant
^ Results not statistically reliable, n<30
† Select 95% CIs have been reported as 'n/a' when estimates are 0.0; therefore, a 95% CI cannot be generated.
* As select estimates are not presented because the results are not statistically reliable, the difference, p-value, and significance could not be calculated; thus, these data are not applicable.
^ Results not statistically reliable, n<30
[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.
[c] Solid fuel is defined as *charcoal*, *wood*, *animal dung*, *straw/shrubs/grass*, and *agriculture crop residue*. The *no food cooked in household* category is removed from percentages.
[d] The average number of persons per sleeping room is a common indicator of crowding (United Nations Development Group 2003).
[e] Disaggregates based on individual household members are calculated using de jure household members.
[f] Natural roofs include thatch (palm leaf, straw, reed), sod or bamboo, and mud. Rudimentary roofs include plastic/polythene and cardboard. Finished roofs include metal (tin or corrugated iron sheet), wood, and cement/concrete.
[g] Natural walls includes mud, bamboo, stone, and straw. Rudimentary walls include cardboard, and plastic/polythene. Finished walls include cement/concrete, bricks, and wood planks/shingles.
[h] Natural floors include earth/sand, dung, and palm leaves. Rudimentary floors include cardboard and plastic. Finished floors include concrete/cement/brick and wood.
Note: Estimates are sample-weighted; numbers of observations are unweighted.
Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table 3.3.2: Comparison of Household Dwelling Characteristics in the Phase One ZOI, by Gendered Household Type and Residence, Feed the Future Phase One Baseline and Endline ZOI Surveys

Characteristic	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[a]	Sig.[b]
	%	95% CI	n	%	95% CI	n			
Percent using solid fuel for cooking (%)[c]									
Gendered household type									
Male and female adults	94.7	92.8 – 96.6	1,751	93.1	91.2 – 95.0	1,738	-1.6	0.271	n/s
Female adults only	94.5	91.1 – 97.9	283	91.1	87.2 – 95.0	313	-3.4	0.209	n/s
Male adults only	^	^	6	^	^	12	^	^	^
Children only	^	^	0	^	^	1	^	^	^
Percent with access to electricity (%)									
Gendered household type									
Male and female adults	46.3	40.7 – 51.9	1,751	86.5	81.8 – 91.2	1,738	40.2	0.000	***
Female adults only	39.1	29.9 – 48.2	283	78.4	68.8 – 88.0	313	39.3	0.000	***
Male adults only	^	^	6	^	^	12	^	^	^
Children only	^	^	0	^	^	1	^	^	^
Number of households			2,040			2,064			

CI=confidence interval; Diff.=difference; n/s=not significant
^ Results not statistically reliable, n<30
[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.
[c] Solid fuel is defined as *charcoal*, *wood*, *animal dung*, *straw/shrubs/grass*, and *agriculture crop residue*. The *no food cooked in household* category is removed from percentages.
Note: Estimates are sample-weighted; numbers of observations are unweighted.
Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

3.4 Water, sanitation, and hygiene

This section presents water, sanitation, and hygiene indicators that align with the Sustainable Development Goals.[18] **Table 3.4.1** presents the percentages of households in the Phase One ZOI that use an improved water source and an improved sanitation facility. The table also presents statistics on the main drinking water source and sanitation facility, comparing estimates at 2011/2012 baseline and 2018/2019 endline.

Drinking water may be contaminated with human or animal feces containing pathogens, or with chemical and physical contaminants with harmful effects on health; therefore, obtaining drinking water from an improved source is critical to prevent transmission of diarrhea and other diseases. It is also important to improve accessibility and availability of drinking water, especially for women and girls, who often bear

[18] UNSTATS (n.d.)

the primary responsibility for collecting water from distant sources.[19] Therefore, the availability and accessibility of households' main drinking water sources are important pieces of information.

Inadequate sanitation and lack of sanitation are closely associated with diarrheal diseases, which, in turn, can contribute to or exacerbate malnutrition. Open defecation is when people use fields, forests, open bodies of water, or other open spaces rather than toilets. Open defecation and inadequate sanitation are dangerous because contact with human waste can cause the vicious and self-reinforcing cycle of undernutrition and infectious diseases, such as cholera, typhoid, hepatitis, diarrhea, and worm infestation. Although access to a hygienic toilet facility is critical to reduce the transmission of pathogens, sharing of sanitation facilities is also an important consideration, given the negative impacts on dignity, privacy, and personal safety, especially for women and girls.[20] According to the World Health Organization (WHO)/UNICEF Joint Monitoring Programme for Water Supply, Sanitation, and Hygiene, a basic sanitation service consists of a sanitation facility that hygienically separates human excreta from human contact (that is, an improved sanitation facility) that is not shared with other households.[21] However, because information to determine whether sanitation facilities meet basic sanitation service criteria was not collected at baseline, this section presents information that was collected at both baseline and endline.

From 2011/2012 baseline to 2018/2019 endline, there were encouraging improvements in water, sanitation, and hygiene characteristics in the Feed the Future Phase One ZOI. Virtually all (97.3 percent) ZOI households use an improved water drinking source at the 2018/2019 endline, up from 85.3 percent. This result is statistically significant at the 0.1 percent level. At the 2018/2019 endline, the vast majority (95.4 percent) of ZOI households use tubewells or boreholes as their primary water source, which increased from 82.4 percent at 2011/2012 baseline. In comparison, the use of other water sources and water piped into the yard or plot declined—both reductions are statistically significant at the 0.1 percent level.

In addition, there were positive changes in sanitation facilities used in the Bangladesh ZOI. The use of private flush toilets among ZOI households is 1.5-times higher at 2018/2019 endline compared with 2011/2012 baseline, increasing from 29.1 percent to 48.8 percent of ZOI households. Also, by endline, fewer ZOI households used unhygienic sanitary methods, such as a bucket or pan (16.5 percent to 2.0 percent). Furthermore, open defecation became practically nonexistent, dropping to 0.1 percent. Both improvements were statistically significant at the 0.1 percent level.

[19] UNICEF and WHO (2018)
[20] UNICEF and WHO (2018)
[21] WHO and UNICEF (2018)

Table 3.4.1: Comparison of Household Water, Sanitation, and Hygiene Characteristics in the Phase One ZOI, Feed the Future Phase One Baseline and Endline ZOI Surveys

Source or facility	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value [a]	Sig. [b]
	%	95% CI	n	%	95% CI	n			
Use improved drinking water source [c]	85.3	80.9 – 89.7	2,040	97.3	94.9 – 99.6	2,064	12.0	0.000	***
Drinking water source									
Piped into dwelling	0.5	0.0 – 1.0	2,040	0.5	0.2 – 0.8	2,064	0.0	0.970	n/s
Piped into yard or plot	2.3	1.4 – 3.2	2,040	0.6	0.3 – 1.0	2,064	-1.7	0.001	**
Tubewell or borehole	82.4	78.1 – 86.8	2,040	95.4	92.7 – 98.2	2,064	13.0	0.000	***
Rainwater collection	0.0	0.0 – 0.1	2,040	0.7	0.0 – 1.8	2,064	-0.7	0.232	n/s
Surface water	4.0	1.0 – 7.0	2,040	2.3	0.1 – 4.5	2,064	-1.7	0.188	n/s
Other	10.7	7.4 – 14.1	2,040	0.5	0.0 – 0.9	2,064	10.3	0.000	***
Use improved sanitation facility [d, *]	—	—	—	35.7	30.9 – 40.5	2,064	n/a	n/a	n/a
Main sanitation facility									
Flush, shared	0.5	0.1 – 0.8	2,040	0.1	0.0 – 0.2	2,064	0.4	0.040	*
Flush, private	29.1	25.6 – 32.6	2,040	48.8	44.5 – 53.2	2,064	19.8	0.000	***
Pit latrine	52.7	48.1 – 57.3	2,040	49.0	44.8 – 53.2	2,064	-3.7	0.231	n/s
Bucket or pan	16.5	13.0 – 20.0	2,040	2.0	1.0 – 3.0	2,064	-14.5	0.000	***
No toilet	1.3	0.7 – 1.8	2,040	0.1	0.0 – 0.2	2,064	1.2	0.000	***
Other [e,†]	0.0	n/a	2,040	0.1	0.0 – 0.2	2,064	-0.1	0.320	n/s
Number of households			2,040			2,064			

CI=confidence interval; Diff.=difference; n/a=not applicable; n/s=not significant

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

*As select estimates are not presented because the data were not collected, the difference, p-value, and significance could not be calculated; thus, these data are not applicable.

† The 95% CI is reported as 'n/a' because the baseline estimates are 0.0; therefore, a 95% CI cannot be generated.

[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[c] Improved water sources include piped water into the dwelling, piped water into the yard, public tap/standpipe, tube well/borehole, protected dug well, protected spring, and rainwater (UNICEF and WHO 2012).

[d] Improved sanitation facilities are those that separate human excreta from human contact; they include the categories *flush to piped sewer system, flush to septic tank, flush/pour flush to pit latrine, composting toilet, ventilated improved pit latrine (only if there is also a slab),* and *pit latrine with a slab* (UNICEF and WHO 2018). Due to unavailability of detailed disaggregated information at baseline necessary to identify improved sanitation facilities, baseline estimates could not be provided.

Note: Estimates are sample-weighted; numbers of observations are unweighted.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

4. HOUSEHOLD ECONOMIC STATUS

This chapter includes a background discussion of monetary poverty in Bangladesh, including the logic of the Living Standards Measurement Study (LSMS)[22] and consumption expenditures methodology. The methodology used to calculate the Feed the Future Phase One ZOI poverty indicators is provided in the Guide to Feed the Future Statistics.[23]

The Feed the Future Phase One ZOI poverty indicators presented in this chapter include daily per capita expenditures in 2010 USD, and prevalence of poverty and depth of poverty at the $1.25 (2005 PPP) poverty line. These indicators are presented in Sections 4.1 and 4.2. The results were generated using household data from the Feed the Future ZOI stratum of the BIHS 2011/2012 and 2018/2019.

In addition, the prevalence of poverty and depth of poverty are presented for Bangladesh's national extreme poverty threshold (lower poverty line) in Section 4.3, and for Bangladesh's national poverty threshold (upper poverty line) in Section 4.4. These results were generated using the HIES 2010 and 2016 data, published by the BBS.

Bangladesh has seen a rapid decline in poverty since the 1990s. Using the national upper poverty line, which incorporates food and non-food poverty lines generated using the cost of basic needs method by BBS from HIES, the incidence of national poverty declined from 56.7 percent to 48.9 percent between 1991/1992 and 2000–a reduction rate of 1.0 percentage point per year. The rate of decline in poverty was faster during the 2000s, with a reduction rate of 1.7 percentage points per year, from 48.9 percent in 2000 to 31.5 percent in 2010. However, the rate of decline in poverty fell to 1.2 percentage points per year between 2010 and 2016, as the rate of poverty decreased from 31.5 percent in 2010 to 24.3 percent in 2016.

Although the poverty rates in rural Bangladesh historically have been higher than urban areas, rural poverty rates have declined faster in the past decade than urban poverty rates. From 2000 to 2010, the rate of decline in poverty in rural areas was 1.7 percentage points per year (52.3 percent to 35.2 percent) compared with 1.4 percentage points per year in urban areas (35.2 percent to 21.3 percent). Nevertheless, the rate of decline in poverty reduced in both rural and urban areas between 2010 and 2016. The rural poverty rate decreased to 26.4 percent in 2016, and the rate of poverty decline decreased to 1.5 percentage points per year between 2010 and 2016. On the other hand, the urban poverty rate decreased to 18.9 percent in 2016, and the rate of poverty decline fell to 0.4 percentage points per year between 2010 and 2016.

The Household Roster and Household Consumption Expenditure modules of the Feed the Future ZOI stratum of BIHS are used to calculate the per capita expenditures and poverty indicators for the $1.25 poverty line at 2005 PPP. The household consumption expenditure module is like the LSMS, where a household's consumption of various food and non-food items is measured to infer household income and well-being. Food and non-food consumption are covered in separate modules in the questionnaire. The consumption expenditure variable is constructed in the following manner. For each food item,

[22] Grosh and Glewwe (1995)

[23] Zalisk, Dupuis, Gauthier, Kaur, Khan, Swindale, and Johnson (2019)

households are asked about household consumption from purchases, production, and other sources (for example, wages, gifts, government programs) in the last week. In general, these consumption levels are valued using prices obtained from households in the BIHS itself. Non-food items include consumables (for example, matches, batteries, soap, kerosene), and clothing, education, and transport. Local property taxes are also included since public goods provision is often linked to local taxes,[24] and zakat,[25] which is linked to wealth. Following current best practice in computing consumption expenditures from household surveys,[26] BIHS expenditure aggregate excludes the following costs because these tend to be lump sum, infrequent expenditures: (1) dowry, wedding, *Hajj* (pilgrimage), and funeral costs, which tend to be financed out of savings (or asset disposal); (2) durable goods (for example, personal computers, electric appliances); and (3) insurance.

Individuals' per capita expenditures are then derived by dividing total household expenditures by the number of household members. From these data, household expenditure totals are calculated and used as a proxy for household income, based on the assumption that a household's consumption is closely related to its income. In this approach, every household member is assumed to have an equal share of the total consumption, regardless of age and other household member characteristics.[27] Household consumption and expenditures are often preferred to income when measuring poverty due to the difficulty in accurately measuring income. According to Deaton, expenditure data are less prone to error, easier to recall, and more stable over time than income data.[28]

Poverty estimates using the national extreme poverty threshold and the national poverty threshold were calculated using HIES 2010 and 2016 datasets.[29] In HIES, household expenditure includes household consumption and other spending by the household. Consumption expenditure of the household is the total value of goods and services explicitly consumed by the household during the reference period. Non-consumption expenditure items include income tax and other taxes, pension, social security contributions, related insurance premium, gifts, and other transfers. Other items included in expenditure are additions to savings and investments.[30]

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[24] Deaton and Zaidi (2002)

[25] A term used in Islamic finance to refer to the obligation that an individual must donate a certain proportion of wealth each year to charitable causes. *Zakat* is a mandatory process for Muslims to physically and spiritually purify their yearly earnings that are over and above what is required to provide the essential needs of a person or family.

[26] Deaton and Zaidi (2002)

[27] Guidelines on constructing the consumption aggregate can be found in Deaton and Zaidi (2002).

[28] Deaton (2008)

[29] HIES 2010 and 2016 have been used to generate poverty indicators at national thresholds instead of BIHS because national poverty lines are derived from HIES. BIHS is not an appropriate dataset for calculating poverty indicators based on national thresholds because (i) per capita consumption expenditure calculation using Feed the Future stratum of BIHS is more comprehensive than HIES; in particular, HIES has collected data on significantly fewer items in their survey. (ii) HIES collected data year-round, whereas Feed the Future ZOI surveys collected data from October 2011 to March 2012 for baseline and November 2018 to February 2019 for endline; therefore, seasonality differences between HIES and BIHS may be an issue and affect comparability of per capita consumption expenditures. (iii) HIES updates their poverty lines each round using price indices (constructed from Törnqvist food price index and non-food CPI). Therefore, using published deflator values, such as General CPI, to adjust the poverty line to real prices in Feed the Future survey years may not be an appropriate approach.

[30] BBS (2016)

4.1 Daily per capita consumption expenditures

Table 4.1.1 and **Table 4.1.2** present the daily per capita consumption expenditure estimates in the Phase One ZOI in constant 2010 USD using the 2005 PPP rate, comparing estimates at 2011/2012 baseline and 2018/2019 endline. **Table 4.1.1** presents means in total and by gendered household type, household educational attainment, and household hunger, and **Table 4.1.2** presents medians in total and by the same selected household characteristics. The tables also include p-values from tests of differences in mean and median per capita expenditures between baseline and endline for all households, as well as for disaggregated categories. Tests for differences in median daily per capita consumption expenditures were conducted using quantile regression.[31]

Daily per capita consumption expenditures serve as a proxy for income. Examining the mean and median together provides information on the distribution of consumption expenditures. As is typical of consumption expenditure and income data, these estimates are positively skewed,[32] with most of the population consuming or spending very little and a small portion of the population consuming much more. Therefore, the mean is a volatile summary statistic because it is affected by these outliers that consume much more. A more robust summary statistic is the median.

Table 4.1.1 shows that the mean daily per capita consumption expenditure in constant 2010 USD using the 2005 PPP rate was $1.78 at 2011/2012 baseline and rose by $0.29 to $2.07 at 2018/2019 endline. The difference is statistically significant at the 0.1 percent level. **Table 4.1.2** shows that the median per capita expenditure was $1.53 at baseline, which rose by $0.29 to $1.82 at endline. This difference is statistically significant at the 0.1 percent level. Since median values are lower than mean values, the expenditure data are positively skewed for both rounds.

Overall, per capita expenditure increased among households with elevating levels of education. However, increases in per capita expenditure between 2011/2012 baseline and 2018/2019 endline are only statistically significant for households with lower educational attainment.

Mean and median per capita expenditures are lower for households that suffer from moderate hunger compared with households with little or no hunger. The average and median per capita expenditure rose by $0.18 and $0.11, respectively, between 2011/2012 baseline and 2018/2019 endline for households suffering from moderate hunger, but the differences are not statistically significant.

[31] Conroy (2012)

[32] Positively skewed (or right-skewed) distribution is a type of distribution where the mean, median, and mode of the distribution are positive rather than negative or zero. In other words, data distribution occurs more on the one side of the scale with a long tail on the right side.

Table 4.1.1: Comparison of Mean Daily Per Capita Consumption Expenditures in Constant 2010 USD at 2005 PPP in the Phase One ZOI, in Total and by Selected Household Characteristics, Feed the Future Phase One Baseline and Endline ZOI Surveys

Characteristic	Baseline (2011/2012)			Endline (2018/2019)					
	Mean	95% CI	n	Mean	95% CI	n	Diff.	p-value[a]	Sig.[b]
All households	1.78	1.72 – 1.84	2,040	2.07	2.01 – 2.14	2,064	0.29	0.000	***
Gendered household type									
Male and female adults	1.76	1.70 – 1.83	1,751	2.04	1.98 – 2.11	1,738	0.28	0.000	***
Female adults only	1.95	1.75 – 2.15	283	2.27	2.11 – 2.43	313	0.32	0.015	*
Male adults only	^	^	6	^	^	12	^	^	^
Children only	^	^	0	^	^	1	^	^	^
Household education									
No education	1.53	1.41 – 1.65	137	2.28	2.05 – 2.52	121	0.75	0.000	***
Less than primary	1.36	1.30 – 1.43	376	1.66	1.57 – 1.75	204	0.29	0.000	***
Completed primary	1.71	1.66 – 1.76	1,084	1.92	1.85 – 1.99	1,088	0.21	0.000	***
Completed secondary	2.18	1.99 – 2.38	231	2.17	2.05 – 2.29	321	-0.02	0.890	n/s
Higher	2.43	2.24 – 2.62	212	2.60	2.48 – 2.73	330	0.17	0.144	n/s
Household hunger									
Little to no hunger	1.83	1.76 – 1.90	1,875	2.09	2.02 – 2.15	2,012	0.26	0.000	***
Moderate hunger	1.20	1.11 – 1.29	145	1.38	1.22 – 1.54	46	0.18	0.056	n/s
Severe hunger	^	^	20	^	^	6	^	^	^

CI=confidence interval; Diff.=difference; n/s=not significant

^ Results not statistically reliable, n<30

[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members. Daily per capita consumption expenditures measured in Bangladeshi Taka local currency units (LCU) were converted to constant 2010 USD using the Basic Needs Price Index (BNPI) and the 2005 Purchasing Power Parity (PPP) Index estimated by the World Bank. The following formula was used: [(2005 BNPI in local currency units [LCU]/survey month and year BNPI LCU)*1/(2005 PPP LCU)]/[(2005 CPI USD/2010 CPI USD)] where 2005 PPP LCU= 25.49389, 2011-12 BNPI LCU= 202.96, 2018-19 BNPI LCU = 289.04, 2005 BNPI LCU=100, 2010 CPI USD=218.06, and 2005 CPI USD=195.30. The conversion factor was 0.021579 for baseline and 0.015152 for endline.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table 4.1.2: Comparison of Median Daily Per Capita Consumption Expenditures in Constant 2010 USD at 2005 PPP in the Phase One ZOI, in Total and by Selected Household Characteristics, Feed the Future Phase One Baseline and Endline ZOI Surveys

Characteristic	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[a]	Sig.[b]
	Median	95% CI	n	Median	95% CI	n			
All households	1.53	1.49 – 1.58	2,040	1.82	1.76 – 1.89	2,064	0.29	0.000	***
Gendered household type									
Male and female adults	1.53	1.49 – 1.58	1,751	1.81	1.75 – 1.87	1,738	0.28	0.000	***
Female adults only	1.63	1.42 – 1.83	283	1.91	1.71 – 2.11	313	0.28	0.013	*
Male adults only	^	^	6	^	^	12	^	^	^
Children only	^	^	0	^	^	1	^	^	^
Household education									
No education	1.35	1.21 – 1.49	137	1.93	1.66 – 2.19	121	0.57	0.000	***
Less than primary	1.22	1.15 – 1.29	376	1.51	1.46 – 1.57	204	0.30	0.000	***
Completed primary	1.51	1.46 – 1.57	1,084	1.71	1.64 – 1.78	1,088	0.19	0.000	***
Completed secondary	1.81	1.60 – 2.01	231	1.93	1.82 – 2.04	321	0.12	0.231	n/s
Higher	2.11	1.91 – 2.30	212	2.33	2.19 – 2.47	330	0.23	0.080	n/s
Household hunger									
Little to no hunger	1.58	1.52 – 1.64	1,875	1.84	1.78 – 1.90	2,012	0.26	0.000	***
Moderate hunger	1.10	1.00 – 1.19	145	1.22	0.96 – 1.48	46	0.11	0.367	n/s
Severe hunger	^	^	20	^	^	6	^	^	^

CI=confidence interval; Diff.=difference; n/s=not significant

^ Results not statistically reliable, n<30

[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates. Quantile regression was used to test for the equality of medians (Conroy 2012).

[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members. Daily per capita consumption expenditures measured in Bangladeshi Taka local currency units (LCU) were converted to constant 2010 USD using the Basic Needs Price Index (BNPI) and the 2005 Purchasing Power Parity (PPP) Index estimated by the World Bank. The following formula was used: [(2005 BNPI in LCU/survey month and year BNPI LCU)*1/(2005 PPP LCU)]/[(2005 CPI USD/2010 CPI USD)] where 2005 PPP LCU= 25.49389, 2011-12 BNPI LCU= 202.96, 2018-19 BNPI LCU = 289.04, 2005 BNPI LCU=100, 2010 CPI USD=218.06, and 2005 CPI USD=195.30. The conversion factor was 0.021579 for baseline and 0.015152 for endline.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

4.2 Prevalence and depth of poverty in the ZOI

The prevalence of poverty, sometimes called the poverty headcount ratio, is measured by determining the percentage of individuals living below a poverty threshold.[33] Estimates of poverty prevalence are sensitive to the poverty thresholds used to identify the poor. A standardized poverty threshold of $1.25 per person per day in 2005 PPP was used to track global changes in poverty across countries. The $1.25 threshold was in effect the extreme poverty threshold and represents the poverty line typical of the

[33] Consumption expenditure data are collected at the household-level. Then, individuals' daily per capita consumption expenditures are derived by dividing total household expenditures by the number of household members.

world's poorest countries.[34] Poverty estimates using the $1.25 poverty line were calculated from the BIHS for the Feed the Future ZOI stratum at 2011/2012 baseline and 2018/2019 endline. Poverty estimates using Bangladesh's poverty and extreme poverty thresholds were also made using data from the HIES for rural Barishal and Khulna divisions, where HIES 2010 was regarded as baseline and HIES 2016 was regarded as endline.

While the prevalence of poverty shows the percentage of the population that are poor, this measure cannot capture any changes in income among the poor. For example, if the extreme poor becomes less poor because of a successful intervention generating incomes for the extreme poor, the depth of poverty would decrease but the prevalence of poverty would remain the same despite this improvement. The depth of poverty, often called the poverty gap, is a useful poverty estimate that helps assess such changes among the poor, capturing the severity or intensity of poverty. This measure indicates the average gap between consumption expenditure levels and the poverty line and is expressed as a proportion of the poverty line. The depth of poverty calculated using the $1.25 poverty line represents the entire Phase One ZOI population, with the non-poor counted as having a gap of zero. The depth of poverty calculated using the national poverty line and the national extreme poverty line represents the population in rural Barishal and Khulna divisions. The average consumption expenditure shortfall of the poor, in contrast, is estimated for only those individuals living below the poverty line. These three indicators—prevalence of poverty, depth of poverty, and the average consumption shortfall—complement each other to present a more complete picture of the poverty situation in the Phase One ZOI.

4.2.1 The $1.25 poverty threshold

The tables in this section present poverty estimates in the Phase One ZOI at the $1.25 per person per day (2005 PPP) threshold, comparing estimates at 2011/2012 baseline and 2018/2019 endline. **Table 4.2.1** presents the prevalence of poverty, **Table 4.2.2** presents the depth of poverty, and **Table 4.2.3** presents the average consumption shortfall of the poor.[35] These indicators were generated for households in the Feed the Future ZOI stratum in BIHS 2011/2012 and 2018/2019. Similar to the daily per capita consumption expenditures table, these tables present poverty estimates for all households in the Phase One ZOI, as well as disaggregated by gendered household type, household educational attainment, and household hunger.

Prevalence of poverty

At the 2011/2012 baseline, 40.7 percent of the ZOI population lived below the $1.25 per day poverty threshold. Poverty headcount reduced to 25.2 percent at 2018/2019 endline. This means that the prevalence of poverty reduced by 37.9 percent between baseline and endline, and the reduction is statistically significant at the 0.1 percent level.

Decreases in the prevalence of poverty at $1.25 (2005 PPP) are also statistically significant at the 0.1 percent level when disaggregated by gendered household types. At the endline, the prevalence of

[34] World Bank (2015)

[35] Confidence intervals for baseline and endline estimates, differences between baseline and endline estimates, and p-values for the differences are tabulated in Appendix 1, Table A1.4.1.1 and Table A1.4.1.2.

poverty was slightly higher among households with both male and female adults compared with households with only female adults. One possible explanation may be that households with female adults only may have migrant spouses who send remittances that help prevent them from falling into poverty.

In **Table 4.2.2**, a correlation between education and poverty can be observed for both baseline and endline–that is, as educational attainment rises, poverty tends to reduce.

The prevalence of poverty decreased for households facing little to no hunger by 13.3 percentage points, and the difference is statistically significant at the 0.1 percent level. The prevalence of poverty reduced for households suffering from moderate hunger between baseline and endline by 11.3 percentage points; however, the result is not statistically significant.

Table 4.2.1: Comparison of Prevalence of Poverty at the $1.25 (2005 PPP) Per Person Per Day Threshold in the Phase One ZOI, in Total and by Selected Household Characteristics, Feed the Future Phase One Baseline and Endline ZOI Surveys

	Baseline (2011/2012)			Endline (2018/2019)				p-value[b]	Sig.[c]
Characteristic	%	95% CI	n[a]	%	95% CI	n[a]	Diff.		
All households	40.6	37.1 – 44.0	2,040	25.2	22.3 – 28.1	2,064	-15.4	0.000	***
Gendered household type									
Male and female adults	40.5	36.9 – 44.1	1,751	25.5	22.4 – 28.5	1,738	-15.1	0.000	***
Female adults only	41.2	32.7 – 49.8	283	23.7	19.2 – 28.3	313	-17.5	0.000	***
Male adults only	^	^	6	^	^	12	^	^	^
Children only	^	^	0	^	^	1	^	^	^
Household education									
No education	53.4	45.2 – 61.5	137	22.0	13.0 – 31.0	121	-31.3	0.000	***
Less than primary	63.4	57.8 – 69.0	376	35.2	29.0 – 41.5	204	-28.2	0.000	***
Completed primary	40.5	36.7 – 44.2	1,084	29.9	26.1 – 33.7	1,088	-10.6	0.000	***
Completed secondary	27.6	20.6 – 34.6	231	20.9	16.2 – 25.6	321	-6.7	0.120	n/s
Higher	14.6	6.7 – 22.4	212	11.0	6.6 – 15.3	330	-3.6	0.435	n/s
Household hunger									
Little to no hunger	37.7	34.1 – 41.3	1,875	24.4	21.5 – 27.3	2,012	-13.3	0.000	***
Moderate hunger	73.9	65.7 – 82.1	145	62.5	48.4 – 76.6	46	-11.3	0.172	n/s
Severe hunger	^	^	20	^	^	6	^	^	^

CI=confidence interval; Diff.=difference; n/s=not significant

^ Results not statistically reliable, n<30

[a] The "n" reflects the unweighted number of households—not the number of household members—even though the prevalence of poverty measures the percentage of individuals living below a poverty threshold. Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

Notes: Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members. The prevalence of poverty, sometimes referred to as the poverty incidence or poverty headcount ratio, is the percentage of individuals living below the $1.25 (2005 PPP) per person per day threshold.

The prevalence of poverty was calculated by first converting the $1.25 per day (2005 PPP) poverty line into local currency units (LCU) by multiplying the $1.25 per day (2005 PPP) poverty line by the 2005 PPP conversion rate of Bangladesh, where LCU 2005 PPP= 25.49389. The resulting figure was then adjusted for the cumulative price inflation between 2005 and the ZOI Survey years by multiplying by the ratio of Bangladesh's Basic Needs Price Index (BNPI) for the survey years and months to the 2005 BNPI, where 2011-12 BNPI LCU=202.96, 2018-19 BNPI LCU =289.04 and 2005 BNPI LCU=100. Finally, after applying the household member sampling weight, the sum of the number of households in which the per capita daily consumption in LCU for the year and month of the ZOI Survey was less than the poverty line in LCU for the year and month of the ZOI Survey was divided by the sum of the number of households with consumption data.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Depth of poverty

The depth of poverty, or poverty gap, is the average consumption shortfall multiplied by the prevalence of poverty. More specifically, the depth of poverty measures the average gap between consumption levels of the population and the poverty line. Between the 2011/2012 baseline and the 2018/2019 endline, the depth of poverty in the ZOI reduced by 51 percent–from 9.3 percent to 4.6 percent. The reduction is statistically significant at the 0.1 percent level.

The depth of poverty indicates the amount of resource transfers that would be needed to bring everyone below the poverty line up to the poverty line, provided that resource transfers were perfectly targeted to poor households. With a ZOI population of 28.7 million at 2018/2019 endline, a poverty threshold of $1.25 per day, and a poverty gap of 4.6 percent, a transfer of $1,651,561 (2005 PPP) per day to the poor would be needed to bring their income or expenditures up to the poverty threshold.

Similar to the estimates for prevalence of poverty, the depth of poverty in general decreased with increasing household educational attainment. Although the reduction in the depth of poverty is statistically significant for households experiencing little to no hunger at the 0.1 percent level, this is not the case for households facing moderate hunger.

Table 4.2.2: Comparison of Depth of Poverty at the $1.25 (2005 PPP) Per Person Per Day Threshold in the Phase One ZOI, in Total and by Selected Household Characteristics, Feed the Future Phase One Baseline and Endline ZOI Surveys

	Baseline (2011/2012)			Endline (2018/2019)					
Characteristic	% of poverty line	95% CI	n[a]	% of poverty line	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
All households	9.3	8.3 – 10.2	2,040	4.6	3.8 – 5.3	2,064	-4.7	0.000	***
Gendered household type									
Male and female adults	9.2	8.2 – 10.2	1,751	4.6	3.8 – 5.4	1,738	-4.6	0.000	***
Female adults only	10.5	7.7 – 13.2	283	4.6	3.4 – 5.9	313	-5.8	0.000	***
Male adults only	^	^	6	^	^	12	^	^	^
Children only	^	^	0	^	^	1	^	^	^
Household education									
No education	15.1	11.5 – 18.8	137	5.4	2.2 – 8.7	121	-9.7	0.000	***
Less than primary	17.1	14.8 – 19.3	376	7.4	4.9 – 9.9	204	-9.7	0.000	***
Completed primary	8.4	7.5 – 9.3	1,084	5.4	4.4 – 6.3	1,088	-3.0	0.000	***
Completed secondary	5.7	3.7 – 7.6	231	3.6	2.5 – 4.7	321	-2.1	0.075	n/s
Higher	3.0	1.4 – 4.6	212	1.6	0.9 – 2.3	330	-1.4	0.134	n/s
Household hunger									
Little to no hunger	8.1	7.2 – 9.0	1,875	4.3	3.6 – 5.0	2,012	-3.8	0.000	***
Moderate hunger	22.4	18.3 – 26.4	145	17.2	11.1 – 23.3	46	-5.1	0.165	n/s
Severe hunger	^	^	20	^	^	6	^	^	^

CI=confidence interval; Diff.=difference; n/s=not significant

^ Results not statistically reliable, n<30

[a] The "n" reflects the unweighted number of households—not the number of household members—even though the depth of poverty measures the average gap between the consumption level of individuals and the poverty line. Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members. The depth of poverty, or poverty gap, is the average consumption shortfall multiplied by the prevalence of poverty.

The depth of poverty was calculated by first subtracting the per capita daily consumption expenditure in local currency units (LCU) for the year and month of the ZOI Survey of each household in the sample from the $1.25 per day poverty line in LCU for the year and month of the ZOI Survey, with the resulting difference set to zero for all non-poor households. The figure was then divided by the $1.25 per day poverty line in LCU for the year and month of the ZOI Survey. Finally, after applying the household member sampling weight, the value for each household was summed across all households and then divided by the sum of the number of all sampled households with consumption data.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Average consumption shortfall of the poor

At the 2011/2012 baseline, the average poor person within the ZOI lived 22.9 percent below the poverty line. This value decreased to 18.18 percent at the 2018/2019 endline. The average consumption shortfall in 2005 PPP decreased from $0.29 to $0.23 between baseline and endline. Average consumption shortfall, both in terms of 2005 PPP and the percent of poverty line, fell across all disaggregation categories between baseline and endline. Poor female adult only households faced a larger shortfall, both in terms of 2005 PPP and the percent of poverty line, compared with households with both male and female adults. There is a clear inverse relationship between household educational attainment and average consumption shortfall at both baseline and endline.

Table 4.2.3: Comparison of Average Consumption Shortfall of the Poor at the $1.25 (2005 PPP) Per Person Per Day Threshold in the Phase One ZOI, in Total and by Selected Household Characteristics, Feed the Future Phase One Baseline and Endline ZOI Surveys

	Baseline (2011/2012)			Endline (2018/2019)		
Characteristic	USD (2005 PPP)	% of poverty line	n[a]	USD (2005 PPP)	% of poverty line	n[a]
All households	0.29	22.9	758	0.23	18.2	444
Gendered household type						
Male and female adults	0.28	22.6	650	0.23	18.0	382
Female adults only	0.32	25.4	107	0.24	19.5	62
Male adults only	^	^	6	^	^	12
Children only	^	^	0	^	^	1
Household education						
No education	0.36	28.4	62	^	^	21
Less than primary	0.34	26.9	217	0.26	21.0	62
Completed primary	0.26	20.8	403	0.22	18.0	279
Completed secondary	0.26	20.6	51	0.22	17.3	53
Higher	^	^	25	^	^	29
Household hunger						
Little to no hunger	0.27	21.5	641	0.22	17.7	415
Moderate hunger	0.38	30.3	99	^	^	26
Severe hunger	^	^	18	^	^	3

^ Results not statistically reliable, n<30

[a] The "n" reflects the unweighted number of households—not the number of household members—even though the average consumption shortfall of the poor measures the percentage of the poverty line at which poor individuals live and the average value of consumption of poor individuals. Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members.

The average consumption shortfall of the poor is the average amount below the poverty threshold of a person in poverty. This value is estimated only among individuals living in households that fall below the poverty threshold.

The average consumption shortfall of the poor, expressed in USD (2005 PPP), was calculated by first subtracting the per capita daily consumption expenditure in local currency units (LCU) for the year and month of the ZOI Survey of each poor household in the sample from the $1.25 per day poverty line in LCU for the year and month of the ZOI Survey. The figure was then converted to 2005 prices by multiplying by the ratio of the 2005 Basic Needs Price Index (BNPI) LCU and the BNPI for the year and month of the ZOI Survey LCU, where 2011-12 BNPI LCU=202.96, 2018-19 BNPI LCU =289.04 and 2005 BNPI LCU=100. The resulting figure was converted to 2005 USD by dividing by the 2005 PPP conversion rate of Bangladesh where LCU 2005 PPP= 25.49389. Finally, after applying the household member sampling weight, the value for each poor household was summed across all poor households and then divided by the sum of the number of all poor sampled households with consumption data.

The average consumption shortfall of the poor, expressed as a percentage of the poverty line, was calculated by first subtracting the per capita daily consumption expenditure in LCU for the year and month of the ZOI Survey of each poor household in the sample from the $1.25 per day poverty line in LCU for the year and month of the ZOI Survey. The figure was then divided by the $1.25 per day poverty line in LCU for the year and month of the ZOI Survey. Finally, after applying the household member sampling weight, the value for each poor household was summed across all poor households and then divided by the sum of the number of all poor sampled households with consumption data.
Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

4.2.2 The national extreme poverty threshold

The tables in this section present poverty estimates in rural Barishal and rural Khulna divisions of Bangladesh at the national extreme poverty threshold. The national extreme poverty threshold is the national lower poverty line, which is the summation of the food poverty line and the lower non-food allowance, as calculated by BBS using the HIES. First, the food poverty line is calculated by estimating the cost of the basic consumption needs bundle for food. This bundle, which provides the minimum nutrition requirement of 2,122 kcal per person per day, consists of eleven food items: coarse rice, wheat, pulses, milk, oil, meat, fish, potatoes, other vegetables, sugar, and fruits. The prices of these food items are estimated using median unit price values from a reference group of households. The food poverty line is then calculated by taking the product price of items and their respective quantities in the food bundle.

The second step entails computing two non-food allowances for non-food consumption. The first is obtained by taking the median amount spent for non-food items by a group of households whose per capita *total expenditure* is close to the food poverty line, which is called the "lower non-food allowance." The second is obtained by taking the median amount spent for non-food items by a group of households whose per capita *food expenditure* is close to the food poverty line, which is called the "upper non-food allowance." The summation of the food poverty line and the lower non-food allowance make up the national lower poverty line of Bangladesh.[36]

Table 4.2.4 presents the prevalence of poverty, **Table 4.2.5** presents the depth of poverty, and **Table 4.2.6** presents the average consumption shortfall of the poor at the national extreme poverty line.[37] These tables present poverty estimates for rural Barishal and rural Khulna divisions only as those regions fall under the Feed the Future ZOI in Bangladesh. The HIES 2010 is considered the baseline and HIES 2016 is considered the endline for these estimates. Similar to the tables in Section 4.2.1, these tables present poverty estimates for all households in rural Barishal and rural Khulna divisions, as well as disaggregated by gendered household type and household educational attainment.

Prevalence of poverty

Table 4.2.4 shows the prevalence of poverty at the national extreme poverty threshold of rural Barishal and rural Khulna divisions of Bangladesh in 2010 and 2016. The poverty rate reduced from 19.6 percent in 2010 to 13.8 percent in 2016. The reduction is statistically significant at the 0.1 percent level. The prevalence of poverty reduced in households consisting of both an adult male and an adult female by 6.0 percentage points, and the difference is statistically significant at the 0.1 percent level. Poverty rates, disaggregated by education categories, reveal that poverty reduced in households with no

[36] BBS (2010); BBS (2016)

[37] Differences between baseline and endline estimates and confidence intervals and p-values for the differences are tabulated in Appendix 1, Table A1.4.2.1 and Table A1.4.2.2.

education and households that completed primary education, and the reductions are statistically significant at the 0.1 percent level. On the other hand, the rate of poverty increased in households with higher education attainment by 3.3 percentage points, and the difference is statistically significant at the 5 percent level.

Table 4.2.4: Comparison of Prevalence of Poverty at the National Extreme Threshold of Bangladesh[d] in rural Barishal and rural Khulna divisions, in Total and by Selected Household Characteristics, Household Income and Expenditure Surveys

	Baseline (2010)			Endline (2016)				p-valu	
Characteristic	%	95% CI	n[a]	%	95% CI	n[a]	Diff.	e[b]	Sig.[c]
All households	19.6	17.5 – 21.6	1,780	13.8	12.9 – 14.7	7,903	-5.8	0.000	***
Gendered household type									
Male and female adults	19.8	17.7 – 21.9	1,640	13.8	12.8 – 14.8	7,235	-6.0	0.000	***
Female adults only	14.9	7.9 – 21.8	128	13.8	10.1 – 17.6	591	-1.0	0.795	n/s
Male adults only[*]	^	^	12	14.4	3.3 – 25.5	76	n/a	n/a	n/a
Children only	^	^	0	^	^	1	^	^	^
Household education									
No education	33.5	27.4 – 39.7	305	19.0	15.0 – 23.0	661	-14.5	0.000	***
Less than primary	31.4	23.4 – 39.4	153	26.3	22.6 – 30.0	854	-5.2	0.249	n/s
Completed primary	21.5	18.5 – 24.5	870	15.2	13.9 – 16.5	4,096	-6.3	0.000	***
Completed secondary	9.5	5.4 – 13.5	223	7.5	5.6 – 9.4	985	-2.0	0.390	n/s
Higher	2.9	0.5 – 5.4	229	6.2	4.6 – 7.8	1,305	3.3	0.028	*
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

CI=confidence interval; Diff.=difference; n/s=not significant

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[*] As select estimates are not presented because the results are not statistically reliable, the difference, p-value, and significance could not be calculated; thus, these data are not applicable

[a] The "n" reflects the unweighted number of households—not the number of household members—even though the prevalence of poverty measures the percentage of individuals living below a poverty threshold. Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[d] Lower poverty line for rural Barishal and rural Khulna divisions were used for calculating the estimates in this table (BBS 2010; BBS 2016)

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members. The prevalence of poverty, sometimes referred to as the poverty incidence or poverty headcount ratio, is the percentage of individuals living below the national extreme poverty threshold (lower poverty line). The lower poverty line is the summation of the food poverty line and the lower non-food allowance.

The prevalence of national extreme poverty was calculated by identifying households with per capita monthly expenditure below the lower poverty line in the year of the HIES, in rural Barishal and rural Khulna divisions, respectively. The lower poverty line for rural Barishal division was 1,284 taka per person per month in 2010 and 1,778 taka per person per month in 2016. The lower poverty line for rural Khulna division was 1,192 taka per person per month in 2010 and 1,677 taka per person per month in 2016 (BBS 2010; BBS 2016). Finally, after applying the household member sampling weight, the sum of the number of households in which the per capita monthly consumption in LCU was less than the lower poverty line in LCU in the year of the HIES was divided by the sum of the number of households with consumption data.

Source: Household Income and Expenditure Survey (HIES), 2010 and 2016.

Depth of poverty

Table 4.2.5 shows the depth of poverty at the national extreme poverty threshold of poverty for rural Barishal and rural Khulna divisions in 2010 and 2016. The depth of poverty decreased from 3.7 percent at 2010 baseline to 2.3 percent at 2016 endline. The difference is statistically significant at the 0.1 percent level. Similar to the prevalence of poverty estimates in **Table 4.2.4**, reductions in the depth of poverty are statistically significant for households consisting of both an adult male and an adult female, households with no education attainment, and households with primary education attainment. The differences are statistically significant at the 0.1 percent level. The depth of poverty increased by 0.6 percentage points between 2010 and 2016 for households with higher education attainment, and the difference is significant at the 1 percent level.

Table 4.2.5: Comparison of Depth of Poverty at the National Extreme Threshold of Bangladesh[d] in rural Barishal and rural Khulna divisions, in Total and by Selected Household Characteristics, Household Income and Expenditure Surveys

	Baseline (2010)			Endline (2016)					
Characteristic	% of poverty line	95% CI	n[a]	% of poverty line	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
All households	3.7	3.2 – 4.2	1,780	2.3	2.1 – 2.5	7,903	-1.4	0.000	***
Gendered household type									
Male and female adults	3.7	3.2 – 4.3	1,640	2.2	2.0 – 2.5	7,235	-1.5	0.000	***
Female adults only	3.0	1.4 – 4.7	128	2.9	1.7 – 4.2	591	-0.1	0.907	n/s
Male adults only*	^	^	12	2.3	0.0 – 5.1	76	n/a	n/a	n/a
Children only	^	^	0	^	^	1	^	^	^
Household education									
No education	8.0	6.1 – 9.9	305	3.9	2.7 – 5.0	661	-4.2	0.000	***
Less than primary	6.2	4.0 – 8.4	153	5.3	4.3 – 6.3	854	-0.9	0.454	n/s
Completed primary	3.7	3.0 – 4.4	870	2.3	2.1 – 2.6	4,096	-1.4	0.000	***
Completed secondary	1.8	0.9 – 2.6	223	1.1	0.8 – 1.5	985	-0.6	0.187	n/s
Higher	0.3	0.0 – 0.6	229	0.9	0.6 – 1.2	1,305	0.6	0.007	**
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

CI=confidence interval; Diff.=difference; n/a=not applicable; n/s=not significant

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

* As select estimates are not presented because the results are not statistically reliable, the difference, p-value, and significance could not be calculated; thus, these data are not applicable.

[a] The "n" reflects the unweighted number of households—not the number of household members—even though the depth of poverty measures the average gap between the consumption level of individuals and the poverty line. Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[d] Lower poverty line for rural Barishal and rural Khulna divisions were used for calculating the estimates in this table (BBS 2010; BBS 2016)

Notes:
Estimates are sample-weighted; numbers of observations are unweighted.
Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members. The depth of poverty, or poverty gap, is the average consumption shortfall multiplied by the prevalence of poverty using the national extreme poverty threshold.
The depth of national extreme poverty was calculated by first subtracting the per capita monthly consumption expenditure in local currency units (LCU) of each household in the sample from the lower poverty line in LCU, for the years of the HIES, for rural Barishal and rural Khulna divisions, respectively. The resulting difference is set to zero for all non-poor households. The figure was then divided by the lower poverty line in LCU for rural Barishal and rural Khulna divisions, respectively, in the year of the HIES. Finally, after applying the household member sampling weight, the value for each household was summed across all households and then divided by the sum of the number of all sampled households with consumption data.
Source: Household Income and Expenditure Survey (HIES), 2010 and 2016.

Average consumption shortfall of the poor

Table 4.2.6 presents the average consumption shortfall of the poor at the national extreme poverty threshold for rural Barishal and rural Khulna divisions in 2010 and 2016. The average consumption shortfall in 2005 PPP reduced from $0.18 to $0.15 between the two survey rounds for all households. Average consumption shortfall in 2005 PPP fell for all disaggregated categories between 2010 and 2016. Similarly, the average consumption shortfall as a percent of the poverty line fell from 19.0 percent to 16.4 percent between 2010 and 2016. The average consumption shortfall as a percent of the poverty line fell for all disaggregated categories between the two survey rounds.

Table 4.2.6: Comparison of Average Consumption Shortfall of the Poor at the National Extreme Threshold of Bangladesh[d] in rural Barishal and rural Khulna divisions, in Total and by Selected Household Characteristics, Household Income and Expenditure Surveys

	Baseline (2010)			Endline (2016)		
Characteristic	USD (2005 PPP)	% of poverty line	n[a]	USD (2005 PPP)	% of poverty line	n[a]
All households	0.18	19.0	317	0.15	16.4	980
Gendered household type						
Male and female adults	0.18	18.9	296	0.15	16.2	903
Female adults only	^	^	19	0.2	21.1	69
Male adults only	^	^	2	^	^	8
Children only	^	^	0	^	^	0
Household education						
No education	0.22	23.9	83	0.19	20.2	104
Less than primary	0.18	19.7	42	0.19	20.0	182
Completed primary	0.16	17.3	166	0.14	15.4	555
Completed secondary	^	^	20	0.14	15.2	71
Higher	^	^	6	0.13	13.9	68
Household hunger						
Little to no hunger	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—

^ Results not statistically reliable, n<30
— = Data are not available as these data were not collected.
[a] The "n" reflects the unweighted number of households—not the number of household members—even though the average consumption shortfall of the poor measures the percentage of the poverty line at which poor individuals live and the average value of consumption of poor individuals. Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[d] Lower poverty line for rural Barishal and rural Khulna divisions were used for calculating the estimates in this table (BBS 2010; BBS 2016)
Notes:
Estimates are sample-weighted; numbers of observations are unweighted.
Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members.
The average consumption shortfall of the poor is the average amount below the national extreme poverty threshold of a person in poverty. This value is estimated only among individuals living in households that fall below the national extreme poverty threshold.
The average consumption shortfall of the poor, expressed in USD (2005 PPP), was calculated by first subtracting the per capita monthly consumption expenditure in local currency units (LCU) of each poor household in the sample from the lower poverty line in LCU for the year of the HIES. The figure was then converted to 2005 prices by multiplying by the ratio of 2005 national upper poverty line and the stratum upper poverty line for the year of the HIES. The 2010 Barishal rural upper poverty line was LCU=1,485; 2010 Khulna rural upper poverty line was LCU = 1,435; 2016 Barishal rural upper poverty line was LCU=2,056; 2016 Khulna rural upper poverty line was LCU=2,019; and 2005 national upper poverty line was LCU=859.10. The resulting figure was converted to 2005 USD by dividing by the 2005 PPP conversion rate of Bangladesh, which is equal to 25.49389. Finally, after applying the household member sampling weight, the value for each poor household was summed across all poor households and then divided by the sum of the number of all poor sampled households with consumption data.
The average consumption shortfall of the poor, expressed as a percentage of the national extreme poverty line, was calculated by first subtracting the per capita monthly consumption expenditure in LCU for the year of the HIES of each poor household in the sample from the lower poverty line in LCU for the year of the HIES. The figure was then divided by the lower poverty line in LCU for the year of the HIES. Finally, after applying the household member sampling weight, the value for each poor household was summed across all poor households and then divided by the sum of the number of all poor sampled households with consumption data.
Source: Household Income and Expenditure Survey (HIES), 2010 and 2016.

4.2.3 The national poverty threshold

The tables in this section present poverty estimates in rural Barishal and rural Khulna divisions at the national poverty threshold. The national poverty threshold is the national upper poverty line, which is the summation of the food poverty line and the upper non-food allowance, as calculated by BBS using HIES. **Table 4.2.7** presents the prevalence of poverty, **Table 4.2.8** presents the depth of poverty, and **Table 4.2.9** presents the average consumption shortfall of the poor at the national poverty line.[38] These tables present poverty estimates for rural Barishal and rural Khulna divisions only as those regions fall under the Feed the Future ZOI in Bangladesh. The HIES 2010 is considered the baseline and HIES 2016 is considered the endline for these estimates. Similar to the tables in Sections 4.2.1 and 4.2.2, these tables present poverty estimates for all households in rural Barishal and rural Khulna divisions, as well as disaggregated by gendered household type and household educational attainment.

Prevalence of poverty

Table 4.2.7 shows the prevalence of poverty at the national poverty threshold of rural Barishal and rural Khulna divisions of Bangladesh in 2010 and 2016. The poverty rate reduced from 34.0 percent in 2010 to 26.7 percent in 2016. The reduction is statistically significant at the 0.1 percent level. The prevalence of poverty reduced in households consisting of both an adult male and an adult female by 7.6 percentage points, and the difference is statistically significant at the 0.1 percent level. Poverty rates disaggregated by education category reveal that poverty has reduced in households with no education attainment and households with primary education attainment, and the reductions are statistically significant at the 0.1 percent level.

[38] Differences between baseline and endline estimates and confidence intervals and p-values for the differences are tabulated in Appendix 1, Table A1.4.3.1 and Table A1.4.3.2.

Table 4.2.7: Comparison of Prevalence of Poverty at the National Threshold of Bangladesh[d] in rural Barishal and rural Khulna divisions, in Total and by Selected Household Characteristics, Household Income and Expenditure Surveys

Characteristic	Baseline (2010)			Endline (2016)			Diff.	p-value[b]	Sig.[c]
	%	95% CI	n[a]	%	95% CI	n[a]			
All households	34.0	31.6 – 36.4	1,780	26.7	25.5 – 27.8	7,903	-7.3	0.000	***
Gendered household type									
Male and female adults	34.4	32.0 – 36.9	1,640	26.8	25.6 – 28.0	7,235	-7.6	0.000	***
Female adults only	24.1	15.4 – 32.7	128	24.1	19.5 – 28.7	591	0.0	0.994	n/s
Male adults only*	^	^	12	19.1	7.4 – 30.9	76	n/a	n/a	n/a
Children only	^	^	0	^	^	1	^	^	^
Household education									
No education	49.1	42.8 – 55.4	305	31.5	26.9 – 36.1	661	-17.7	0.000	***
Less than primary	49.5	41.2 – 57.9	153	41.7	37.7 – 45.6	854	-7.8	0.096	n/s
Completed primary	38.2	34.8 – 41.7	870	30.9	29.2 – 32.6	4,096	-7.3	0.000	***
Completed secondary	19.0	13.4 – 24.5	223	16.6	13.9 – 19.4	985	-2.3	0.459	n/s
Higher	10.6	6.1 – 15.2	229	11.9	9.8 – 14.0	1,305	1.3	0.619	n/s
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

CI=confidence interval; Diff.=difference, n/a=not applicable; n/s=not significant.
^ Results not statistically reliable, n<30
— = Data are not available as these data were not collected.
*As select estimates are not presented because the results are not statistically reliable, the difference, p-value, and significance could not be calculated; thus, these data are not applicable.
[a] The "n" reflects the unweighted number of households—not the number of household members—even though the prevalence of poverty measures the percentage of individuals living below a poverty threshold. Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.
[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.
[d] Upper poverty line for rural Barishal and rural Khulna divisions were used for calculating the estimates in this table (BBS 2010; BBS 2016)
Notes:
Estimates are sample-weighted; numbers of observations are unweighted.
Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members. The prevalence of poverty, sometimes referred to as the poverty incidence or poverty headcount ratio, is the percentage of individuals living below the national poverty threshold (upper poverty line). The upper poverty line is the summation of the food poverty line and the upper non-food allowance.
The prevalence of national poverty was calculated by identifying households with per capita monthly expenditure below the upper poverty line in the year of the HIES, in rural Barishal and rural Khulna divisions, respectively. The upper poverty line for rural Barishal division was 1,485 taka per person per month in 2010 and 2,056 taka per person per month in 2016. The upper poverty line for rural Khulna division was 1,435 taka per person per month in 2010 and 2,019 taka per person per month in 2016. Finally, after applying the household member sampling weight, the sum of the number of households in which the per capita monthly consumption in LCU for was less than the upper poverty line in LCU in the year of the HIES was divided by the sum of the number of households with consumption data.
Source: Household Income and Expenditure Survey (HIES), 2010 and 2016.

Depth of poverty

Table 4.2.8 shows the depth of poverty at the national threshold of poverty for rural Barishal and rural Khulna divisions in 2010 and 2016. The depth of poverty decreased from 7.2 percent at 2010 baseline to 5.0 percent at 2016 endline. The difference is statistically significant at the 0.1 percent level. Similar to the prevalence of poverty estimates in **Table 4.2.7**, the reductions in the depth of poverty are statistically significant for male and female adult households, households with no education attainment,

and households with primary education attainment. The differences are statistically significant at the 0.1 percent level.

Table 4.2.8: Comparison of Depth of Poverty at the National Threshold of Bangladesh[d] in rural Barishal and rural Khulna divisions, in Total and by Selected Household Characteristics, Household Income and Expenditure Surveys

	Baseline (2010)			Endline (2016)					
Characteristic	% of poverty line	95% CI	n[a]	% of poverty line	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
All households	7.2	6.6 – 7.9	1,780	5.0	4.7 – 5.3	7,903	-2.2	0.000	***
Gendered household type									
Male and female adults	7.3	6.6 – 8.0	1,640	5.0	4.7 – 5.3	7,235	-2.3	0.000	***
Female adults only	5.7	3.3 – 8.0	128	5.4	3.8 – 6.9	591	-0.3	0.834	n/s
Male adults only*	^	^	12	4.5	0.7 – 8.2	76	n/a	n/a	n/a
Children only	^	^	0	^	^	1	^	^	^
Household education									
No education	13.3	11.0 – 15.7	305	7.3	5.8 – 8.7	661	-6.0	0.000	***
Less than primary	12.0	9.2 – 14.7	153	9.8	8.5 – 11.1	854	-2.1	0.170	n/s
Completed primary	7.6	6.7 – 8.6	870	5.5	5.1 – 5.9	4,096	-2.1	0.000	***
Completed secondary	3.5	2.2 – 4.8	223	2.7	2.1 – 3.3	985	-0.8	0.277	n/s
Higher	1.3	0.6 – 2.0	229	2.1	1.6 – 2.6	1,305	0.8	0.055	n/s
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

CI=confidence interval; Diff.=difference, n/a=not applicable, n/s=not significant.

^ Results not statistically reliable, n<30. — = Data are not available as these data were not collected.

* As select estimates are not presented because the results are not statistically reliable, the difference, p-value, and significance could not be calculated; thus, these data are not applicable.

[a] The "n" reflects the unweighted number of households—not the number of household members—even though the depth of poverty measures the average gap between the consumption level of individuals and the poverty line. Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[d] Upper poverty line for rural Barishal and rural Khulna divisions were used for calculating the estimates in this table (BBS 2010; BBS 2016)

Notes:

Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members. The depth of poverty, or poverty gap, is the average consumption shortfall multiplied by the prevalence of poverty using the national poverty threshold.

The depth of national poverty was calculated by first subtracting the per capita monthly consumption expenditure in local currency units (LCU) of each household in the sample from the upper poverty line in LCU, for the years of the HIES, for rural Barishal and rural Khulna divisions, respectively. The resulting difference is set to zero for all non-poor households. The figure was then divided by the upper poverty line in LCU for rural Barishal and rural Khulna divisions, respectively, in the year of the HIES surveys. Finally, after applying the household member sampling weight, the value for each household was summed across all households and then divided by the sum of the number of all sampled households with consumption data.

Source: Household Income and Expenditure Survey (HIES), 2010 and 2016.

Average consumption shortfall of the poor

Table 4.2.9 presents average consumption shortfall of the poor at the national poverty threshold for rural Barishal and rural Khulna divisions in 2010 and 2016. The average consumption shortfall in 2005 PPP reduced from $0.24 to $0.21 between the two survey rounds for all households. The average consumption shortfall in 2005 PPP fell for all disaggregated categories between 2010 and 2016. Similarly, average consumption shortfall as a percent of the poverty line fell from 21.3 percent to 18.9 percent between 2010 and 2016. The average consumption shortfall as a percent of poverty line fell for all disaggregated categories between the two rounds.

Table 4.2.9: Comparison of Average Consumption Shortfall of the Poor at the National Threshold of Bangladesh[d] in rural Barishal and rural Khulna divisions, in Total and by Selected Household Characteristics, Household Income and Expenditure Surveys

	Baseline (2010)			Endline (2016)		
Characteristic	USD (2005 PPP)	% of poverty line	n[a]	USD (2005 PPP)	% of poverty line	n[a]
All households	0.24	21.3	549	0.21	18.9	1,912
Gendered household type						
Male and female adults	0.24	21.2	519	0.21	18.7	1,776
Female adults only	^	^	28	0.25	22.2	124
Male adults only	^	^	2	^	^	12
Children only	^	^	0	^	^	0
Household education						
No education	0.30	27.1	124	0.26	23.1	181
Less than primary	0.27	24.2	66	0.26	23.6	308
Completed primary	0.22	20.0	299	0.20	17.8	1,135
Completed secondary	0.21	18.6	39	0.19	16.7	151
Higher	^	^	21	0.20	17.7	137
Household hunger						
Little to no hunger	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[a] The "n" reflects the unweighted number of households—not the number of household members—even though the average consumption shortfall of the poor measures the percentage of the poverty line at which poor individuals live and the average value of consumption of poor individuals. Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[d] Upper poverty line for rural Barishal and rural Khulna divisions were used for calculating the estimates in this table (BBS 2010; BBS 2016)

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members.

The average consumption shortfall of the poor is the average amount below the national poverty threshold of a person in poverty. This value is estimated only among individuals living in households that fall below the national poverty threshold.

The average consumption shortfall of the poor, expressed in USD (2005 PPP), was calculated by first subtracting the per capita monthly consumption expenditure in local currency units (LCU) of each poor household in the sample from the upper poverty line in LCU for the year of the HIES. The figure was then converted to 2005 prices by multiplying by the ratio of the 2005 national upper poverty line and the stratum upper poverty line for the year of the HIES. The 2010 Barishal rural upper poverty line was LCU=1,485; 2010 Khulna rural upper poverty line was LCU = 1,435; 2016 Barishal rural upper poverty line was LCU=2,056; 2016 Khulna rural upper poverty line was LCU=2,019; and 2005 national upper poverty line was LCU=859.10. The resulting figure was converted to 2005 USD by dividing by the 2005 PPP conversion rate of

Bangladesh, which is equal to 25.494. Finally, after applying the household member sampling weight, the value for each poor household was summed across all poor households and then divided by the sum of the number of all poor sampled households with consumption data.
The average consumption shortfall of the poor, expressed as a percentage of the national poverty line, was calculated by first subtracting the per capita monthly consumption expenditure in LCU for the year of the HIES of each poor household in the sample from the upper poverty line in LCU for the year of the HIES. The figure was then divided by the upper poverty line in LCU for the year of the HIES. Finally, after applying the household member sampling weight, the value for each poor household was summed across all poor households and then divided by the sum of the number of all poor sampled households with consumption data.
Source: Household Income and Expenditure Survey (HIES), 2010 and 2016.

5. WOMEN'S EMPOWERMENT IN AGRICULTURE

This chapter presents findings related to the Women's Empowerment in Agriculture Index (WEAI).[39] Although women play a prominent role in agriculture, they face persistent economic and social constraints. Closing the gender gap in agriculture is critical to achieving Feed the Future's objectives of increasing agricultural productivity and efficiency, reducing hunger and malnutrition, and achieving food security.

5.1 Overview

The WEAI is the first ever measure to directly capture women's empowerment and inclusion in the agriculture sector and was originally developed to track changes in women's empowerment that occur as a direct or indirect result of Feed the Future programming. Following its widespread uptake, the WEAI was improved and streamlined to make it less time-consuming and less expensive to collect, resulting in the abbreviated WEAI (A-WEAI).[40] All five domains of the original WEAI are retained, but the 10 indicators in the original WEAI are reduced to six in the A-WEAI.

The A-WEAI survey module is administered to the primary adult male decision-maker and the primary adult female decision-maker (18 years of age or older) in each household so that the relative empowerment of women and men in the same household can be compared. The primary adult male and female decision-makers self-identify as the man or woman who makes more social and economic decisions than other men or women in the household; this information is collected as part of the household roster module. Households are excluded from responding to questions in the A-WEAI modules if there is only a self-identified primary adult male decision-maker and no self-identified primary adult female decision-maker, or if there are no adults 18 years of age or older in the household.[41]

The A-WEAI comprises two sub-indices: The Five Dimensions of Empowerment (5DE), and the Gender Parity Index (GPI). The A-WEAI applies the same weights to the 5DE and the GPI as the original WEAI. The 5DE is weighted 90 percent, and the GPI is weighted 10 percent.

The A-WEAI score is calculated as: *A-WEAI score=0.9(5DE)+0.1(GPI)*

The 5DE score captures two things: (1) the percentage of women who are empowered, and (2) the average percentage of indicators that compose the 5DE in which disempowered women have adequate achievements.

[39] Alkire et al. (2013)

[40] For more information, please refer to the Instructional Guide for the Abbreviated Women's Empowerment in Agriculture Index.

[41] The only respondents to the A-WEAI survey module are primary adult decision-makers in the household and, therefore, are not representative of the entire adult female and male populations in the ZOI. It is thus essential to remember that the A-WEAI data reflect only the primary adult female and male decision-makers when interpreting the data. However, for consistent terminology throughout this report, the terms "woman," "female," "man," and "male" will be used to refer to the primary adult female or male decision-makers from whom the data were collected.

The formula to calculate the 5DE score is as follows:[42] $5DE\ score=H_e+H_n(A_a)$

Where:

H_e=percentage of women who are empowered

H_n=percentage of disempowered women

A_a=average percentage of indicators in which disempowered women have adequate achievements

A 5DE score can be improved by increasing the percentage of empowered women or, for those women who are disempowered, by increasing the percentage of indicators achieved by the women who are disempowered.

The 5DE is composed of five domains: (1) productive decisions, (2) resources, (3) income, (4) group membership, and (5) time allocation. These five domains are comprised of six indicators. Each domain of the 5DE is equally weighted at one-fifth. The productive decisions, income, group membership, and time allocation domains are composed of a single indicator, and thus these domains and the corresponding indicator carry the same weight of one-fifth. The resources domain is also weighted one-fifth but is composed of two indicators: ownership of assets, with the corresponding weight of two-fifteenths; and access to and decisions on credit, with the corresponding weight of one-fifteenth.

The six indicators that are combined together to measure 5DE are presented in **Table 5.1.1**. These indicators represent whether an individual has achieved adequate empowerment in the respective activities. Individuals who achieve adequate empowerment in these indicators are said to be achieving adequacy. An individual who has adequate achievements in 80 percent or more of the weighted indicators that compose the 5DE is identified as empowered (equivalent to four of the five A-WEAI domains).[43] These indicators are also used to compute an inadequacy score for each individual, which is the weighted average of the indicators (0=adequate; 1=inadequate), and is used in the GPI calculation. **Table 5.1.1** presents the 5DE domains, indicators, and adequacy cut-offs. Appendix 4.1 presents more information, including the survey questions and criteria used to determine adequacy for each 5DE indicator.

[42] The *Feed the Future Guide to Statistics* calculates the 5DE as: 5DE score=1–(HpxAp), where Hp=the number of disempowered respondents in the ZOI (respondents whose disempowerment score is greater than 0.2) divided by the total population of respondents in the ZOI with complete 5DE indicator data; and Ap=the average inadequacy score of disempowered women (that is, the average censored inadequacy score).

[43] In the original WEAI, an individual must achieve adequacy in four of the five WEAI domains or in 80 percent of the weighted WEAI indicators. The A-WEAI is composed of fewer indicators, and therefore an individual must achieve adequacy in four of the five domains to reach the 80 percent threshold for empowerment.

Table 5.1.1: A-WEAI Domains, Indicators, and Definitions of Adequacy

Domain	Indicator	Definition of indicator adequacy
Production	Input in productive decisions	Adequate if for at least one activity, an individual decides alone; OR participates and has input into some, or most or all decisions regarding the activity; OR someone else decides but feels she/he could decide to a medium or high extent if she/he wanted to
Resources	Ownership of assets	Adequate if individual owns—alone or jointly—at least one large asset or at least two small asset types
	Access to and input into decisions on credit	Adequate if individual—alone or jointly—makes decisions about at least one source of credit accessed by her household[a]
Income	Control over use of income	Adequate if individual participates in and has input into some, most, or all decisions about income generated from an activity; OR she/he makes decisions, has input into decisions, or feels she/he could make decisions (if desired) about employment or major household expenditures (excluding minor expenditures)
Leadership	Group membership	Adequate if individual is an active member of at least one group[b]
Time	Workload	Adequate if individual worked less than 10.5 hours during the previous day[c]

[a] Respondents who live in households that did not access credit are considered inadequate on access to credit and decisions on credit and receive a score of 0.
[b] Respondents who report that no groups exist in their communities or who are not aware of any groups in their community are considered inadequate on group membership.
[c] Respondents who reported the past 24 hours as being an atypical workday are excluded.
Source: Adapted from Malapit et al. (2015)

The A-WEAI survey questions that are administered to the primary adult female decision-maker and used to determine her empowerment status and calculate the inadequacy score are also administered to the primary adult male decision-maker in the same household and used to determine his empowerment status and inadequacy score. The GPI is the second sub-index of the A-WEAI and is calculated using these data from households with both a primary adult female and male decision-maker.

The GPI measures the extent of inequality in empowerment in a household between the primary adult male decision-maker and the primary adult female decision-maker. The GPI excludes households that lack both a primary adult male decision-maker and a primary adult female decision-maker. A household is considered to lack gender parity if the woman is disempowered and her inadequacy score is higher than that of the man. The GPI comprises two components: (1) proportion of gender parity-inadequate households, and (2) the average empowerment gap, which is the average normalized percentage gap in the censored inadequacy score of women and men in households that do not have gender parity.

The average normalized empowerment gap (I_{GPI}) is calculated as:

$$I_{GPI}=(\text{inadequacy score}_{woman}-\text{inadequacy score}_{man})/(1-\text{inadequacy score}_{man})$$

Note that the empowerment gap is normalized because each household has a different threshold for gender parity that is based on the man's inadequacy score in the household. The average empowerment

gap is normalized by dividing each difference in inadequacy scores by the maximum possible gap for women, which is 1 (that is, complete inadequacy) minus the man's inadequacy score.

The GPI score is calculated as: $GPI=1-(H_{GPI}xI_{GPI})$

Where:

H_{GPI}=percentage of women without gender parity

I_{GPI}=average normalized empowerment gap

A GPI score can be improved by increasing the percentage of women who have gender parity or, for those women who are less empowered than men, by reducing the empowerment gap between the woman and man in the same household.

This chapter presents findings on the A-WEAI and the indices and indicators that compose the index, comparing Phase One ZOI estimates at the 2011/2012 baseline and at the 2018/2019 endline. For additional details on calculating the A-WEAI, please refer to the *Guide to Feed the Future Statistics*.[44]

5.2 Summary of A-WEAI results

This section presents the following A-WEAI results for women and men at 2011/2012 baseline and at 2018/2019 endline: (1) A-WEAI scores, disaggregated by age group; (2) 5DE scores, representing the percentage of individuals achieving empowerment; (3) GPI scores, including the percentage of women achieving gender parity; and (4) the average empowerment gap.

Table 5.2.1 presents an overview of the A-WEAI, 5DE, and GPI scores, disaggregated by age group and compares estimates at 2011/2012 baseline and 2018/2019 endline.

Women's and men's empowerment and gender parity improved significantly in the Bangladesh ZOI between 2011/2012 and 2018/2019. Women's A-WEAI score increased from 0.68 to 0.89—a 30.9 percent improvement, which is statistically significant at the 0.1 percent level. The improvement in women's empowerment in the ZOI has been remarkable—only 30.5 percent of women were empowered at baseline, which increased to 68.7 percent at the endline. This change is statistically significant at the 0.1 percent level. Women's 5DE score increased from 0.67 to 0.89, and men's 5DE increased from 0.77 to 0.86—both increases are statistically significant at the 0.1 percent level. Although average adequacy scores among disempowered women increased from 51.9 percent to 64.0 percent, which is statistically significant at the 0.1 percent level, average adequacy scores among disempowered men remained relatively static over time (62.4 percent to 63.2 percent).

The proportion of women achieving gender parity increased from about one-half (49.6 percent) at 2011/2012 baseline to over three-quarters (78.6 percent) at 2018/2019 endline. Encouragingly, the overall gender parity score increased from 0.81 to 0.95, with 1.00 representing complete gender parity. The average empowerment gap declined by 40.5 percent—that is, from 0.37 at 2011/2012 baseline to

[44] Zalisk, Dupuis, Gauthier, Kaur, Khan, Swindale, and Johnson (2019)

0.22 at 2018/2019 endline. These results indicate commendable improvements in gender equality within Bangladesh Feed the Future ZOI households.

Table 5.2.1: Comparison of A-WEAI, 5DE, and GPI Scores, and Average Empowerment Gap in the Phase One ZOI, Feed the Future Phase One Baseline and Endline ZOI Surveys

Indicator	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[a]	Sig.[b]
	Est.	95% CI	n	Est.	95% CI	n			
Women[c]									
A-WEAI score	0.68	0.66 – 0.70	1,850	0.89	0.88 – 0.90	1,831	0.21	0.000	***
Age category									
18-29	0.62	0.58 – 0.66	508	0.87	0.85 – 0.90	323	0.25	0.000	***
30+	0.70	0.68 – 0.73	1,342	0.90	0.88 – 0.91	1,508	0.19	0.000	***
5DE score	0.67	0.64 – 0.69	1,850	0.89	0.87 – 0.90	1,831	0.22	0.000	***
Women achieving empowerment (%)	30.50	26.78 – 34.28	1,850	68.70	64.56 – 71.54	1,831	38.15	0.000	***
Weighted indicators in which disempowered individuals have adequate achievements (%)[d]	51.90	50.26 – 53.55	1,284	64.00	63.16 – 65.40	589	12.05	0.000	***
Number of women		1,850			1,831				
GPI score	0.81	0.79 – 0.83	1,594	0.95	0.95 – 0.96	1,526	0.14	0.000	***
Women achieving gender parity (%)	49.60	45.36 – 53.77	1,594	78.6	75.48 – 81.70	1,526	29.02	0.000	***
Age category									
18-29	43.30	37.60 – 49.02	442	74.13	68.26 – 80.00	279	30.82	0.000	***
30+	51.86	47.13 – 56.59	1,152	79.54	76.20 – 82.89	1,247	27.68	0.000	***
Average empowerment gap	0.37	0.35 – 0.40	793	0.22	0.20 – 0.24	323	-0.15	0.000	***
Number of dual-adult households		1,594			1,526				
Men[e]									
5DE score	0.77	0.76 – 0.79	1,601	0.86	0.85 – 0.87	1,565	0.09	0.000	***
Men achieving empowerment (%)	39.70	36.24 – 43.09	1,601	63.20	60.29 – 66.30	1,565	23.50	0.000	***
Weighted indicators in which disempowered individuals have adequate achievements (%)[d]	62.40	61.61 – 63.24	974	63.20	62.31 – 64.11	585	0.77	0.173	n/s
Number of men		1,601			1,565				

Est.=estimate; n/s=not significant

[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[c] Estimates for women exclude households that do not have a primary adult female decision-maker or that have missing or incomplete indicator data.

[d] Also referred to as the average adequacy score.

[e] Estimates for men exclude households that do not have a primary adult male decision-maker or that have missing or incomplete indicator data.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on primary adult decision-makers who are de jure household members.

The WEAI was calculated at baseline, but only data for the A-WEAI were collected at the endline; therefore, a baseline value for the A-WEAI was calculated so that baseline-endline comparisons could be made.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table 5.2.2 presents the percentages of women and men achieving empowerment in the Phase One ZOI disaggregated by age, education, poverty status, region, and whether a woman's child is being fed according to recommendations,[45] comparing estimates at baseline and at endline.

Overall, empowerment increased, particularly among those with relatively lower educational attainment. The percentage of empowered women increased from 30.5 percent to 68.7 percent between 2011/2012 baseline and 2018/2019 endline—an increase statistically significant at the 0.1 percent level. While women became more empowered across all education levels, women with secondary education or less became more empowered than women with higher than secondary education. Women's empowerment improved among poor and non-poor women by 43.4 percentage points and 35.4 percentage points, respectively. Changes in women's empowerment did not differ by age.

While it may seem counterintuitive that women who are more poor or less educated became more empowered than non-poor and more educated women over time, evidence shows that group-based programs in Bangladesh implemented by BRAC, Grameen Bank, and other organizations primarily target poor households. Poor women are typically less educated. Research shows that poor women's membership in these group-based programs enhances their empowerment.[46] Wealthier women are not targeted by these initiatives, and they are more typically (although not always) part of more conservative households where they may have less agency or autonomy.

Men's empowerment increased from 39.7 percent at 2011/2012 baseline to 63.2 percent at 2018/2019 endline—a change that is statistically significant at the 0.1 percent level. Although changes in men's empowerment did not vary by age, there were stark differences by educational attainment. Similar to the pattern observed in women's empowerment, men who had completed primary education or less had greater gains in empowerment than more educated men. Changes in empowerment were higher among poor men than non-poor men (30.1 percentage points versus 19.2 percentage points, respectively).

Between 2011/2012 baseline and 2018/2019 endline, economic disparities in empowerment were substantially diminished. At 2011/2012 baseline, poor men and women were less likely to be empowered than their non-poor counterparts, but by endline, there was a slightly higher prevalence of poor men and women who were empowered than their non-poor counterparts.

[45] The education and maternal behavior disaggregates were selected because they were positively associated with women's empowerment scores when the data were analyzed at baseline under Feed the Future Phase One. More details can be found in the WEAI Baseline Report. No clear relationship for poverty was found at baseline; however, it is important to understand how empowerment status varies for individuals in households living above or below the $1.90 poverty line. Further analysis should be considered on the basis of these results. All disaggregates should align with the indicator definitions presented in the *Feed the Future Indicator Handbook.*

[46] Sraboni et al. (2014)

Table 5.2.2: Comparison of Empowerment in the Phase One ZOI by Sex, Age, Education, Poverty Status, Region, and Child Feeding Behavior, Feed the Future Phase One Baseline and Endline ZOI Surveys

	Baseline (2011/2012)			Endline (2018/2019)					
Characteristic	Est.[a]	95% CI	n	Est.[a]	95% CI	N	Diff.	p-value[b]	Sig.[c]
Women									
All women	30.5	26.8 – 34.3	1,850	68.7	65.3 – 72.1	1,831	38.1	0.000	***
Age category									
18-29	24.3	19.5 – 29.1	508	65.0	58.6 – 71.5	323	40.7	0.000	***
30+	32.8	28.8 – 36.8	1,342	69.4	65.8 – 73.0	1,508	36.6	0.000	***
Education									
No education	31.6	27.1 – 36.2	743	69.9	65.7 – 74.3	649	38.3	0.000	***
Less than primary	34.3	27.4 – 41.2	316	75.5	69.5 – 81.6	284	41.3	0.000	***
Completed primary	28.6	23.5 – 33.6	691	67.4	62.6 – 72.2	787	38.8	0.000	***
Completed secondary	22.3	10.6 – 34.0	66	59.0	44.6 – 73.4	67	36.7	0.000	***
Higher	24.9	8.5 – 41.3	34	47.6	31.8 – 63.3	44	22.7	0.028	*
Poverty status									
Poor	27.6	22.8 –32.4	683	71.0	65.2 – 76.8	407	43.4	0.000	***
Non-poor	32.5	28.4 – 36.6	1,167	67.9	64.2 – 71.5	1,424	35.4	0.000	***
0-5 months old exclusively breastfed[d]									
Yes	—	—	—	—	—	—	—	—	—
No	—	—	—	—	—	—	—	—	—
6-23 months old with minimum acceptable diet[e]									
Yes	—	—	—	—	—	—	—	—	—
No	—	—	—	—	—	—	—	—	—
Men									
All men	39.7	36.2 – 43.1	1,601	63.2	60.3 – 66.0	1,565	23.5	0.000	***
Age category									
18-29	32.7	24.9 – 40.5	202	53.9	45.2 – 62.7	138	21.2	0.000	***
30+	40.5	36.8 – 44.6	1,399	63.8	60.8 – 66.9	1,427	23.3	0.000	***
Education									
No education	37.4	32.7 – 42.2	677	61.6	57.0 – 66.1	626	24.2	0.000	***
Less than primary	37.4	30.6 – 44.3	233	58.7	51.0 – 66.4	220	21.3	0.000	***
Completed primary	41.0	36.1 – 45.8	526	68.6	64.4 – 72.7	533	27.6	0.000	***
Completed secondary	55.0	44.2 – 65.7	88	61.2	50.0 – 72.4	90	6.2	0.435	n/s

Higher	40.1	28.7 – 51.5	77	55.0	42.9 – 67.1	96	14.9	0.057	*
Poverty status									
Poor	33.5	29.4 – 37.7	585	63.6	58.1 – 69.1	349	30.1	0.000	***
Non-poor	43.7	39.4 – 48.1	1,016	63.0	59.8 – 66.2	1,216	19.2	0.000	***

CI=confidence interval; Diff.=difference; Est.=estimate; n/s=not significant

— = Data are not available as these data were not collected in the ZOI surveys.

[a] Estimates for women exclude households that do not have a primary adult female decision-maker or that have missing or incomplete indicator data; estimates for men exclude households that do not have a primary adult male decision-maker or that have missing or incomplete indicator data.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[d] The 'yes' category indicates the percentage of primary adult female decision-makers who achieved empowerment if any children 0-5 months of age for whom they are primary caregivers were exclusively breastfed during the day and night preceding the survey. The 'no' category indicates percentage of primary adult female decision-makers who achieved empowerment if none of the children 0-5 months of age for whom they are primary caregivers were exclusively breastfed during the day and night preceding the survey. Primary adult female decision-makers who are not primary caregivers of children 0-5 months of age are excluded.

[e] The 'yes' category indicates the percentage of primary adult female decision-makers who achieved empowerment if any children 6-23 months of age for whom they are primary caregivers received a minimum acceptable diet during the day and night preceding the survey. The 'no' category indicates the percentage of primary adult female decision-makers who achieved empowerment if none of the children 6-23 months of age for whom they are primary caregivers received a minimum acceptable diet during the day and night preceding the survey. Primary adult female decision-makers who are not primary caregivers of children 6-23 months of age are excluded.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on primary adult decision-makers who are de jure household members.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Empowerment is a complex and multidimensional concept. Aggregating the different dimensions of empowerment into a single index to generate the A-WEAI score provides a simple way to communicate the status of women's empowerment in agriculture, compare those scores across countries and over time, and analyze the relationship of women's empowerment in agriculture to other outcomes of interest, such as hunger and malnutrition. A-WEAI scores also provide incentives for decision-makers to reduce the prevalence and intensity of disempowerment.

Based on the A-WEAI methodology, empowerment in agriculture occurs when a woman has adequate achievements across the 80 percent of the indicators that compose the index. Therefore, decomposing the A-WEAI and examining its individual indicators helps identify the greatest constraints to empowerment, designing policies and programs to reduce those constraints, and understanding how and why those constraints change over time.

5.3 A-WEAI domain and indicator results

This section presents A-WEAI results for the Feed the Future Phase One baseline and endline ZOI Surveys, disaggregated by age and decomposed by: (1) average percentage of individuals achieving adequacy across the six A-WEAI indicators; (2) contribution of each indicator to empowerment; and (3) percentage of individuals with adequate achievements in each A-WEAI indicator, using censored headcount ratios. Examining censored headcount ratios (that is, percentages) helps focus attention on those indicators that are the biggest constraints to empowerment *among the disempowered.* Uncensored headcount ratios present indicator results *regardless of empowerment status* by identifying those indicators that report the lowest percentages achieving adequacy.[47]

Table 5.3.1 presents the average censored headcount ratios (that is, percentages) of women achieving adequacy in the six A-WEAI indicators, which is also a Feed the Future Phase Two context indicator. The purpose of reporting on the average percentage of women achieving adequacy across the six A-WEAI indicators overall and for individual indicators is two-fold: (1) to bring greater attention to the composition of empowerment and disempowerment, and (2) to identify the individual indicators that present the greatest constraints to empowerment for women and men.

The percentage of women achieving adequacy in the six A-WEAI indicators decreased from 34.1 percent at 2011/2012 baseline to 18.8 percent at 2018/2019 endline–a 15.3 percentage point decrease.

[47] The censored headcount ratios present results from respondents who are disempowered and have adequate achievements in a given indicator, divided by the total number of respondents. Uncensored headcount ratios present results from all individuals achieving adequacy in a given indicator, regardless of empowerment status, divided by the total number of respondents. Indicator results using uncensored headcount ratios can be found in Appendix 1.2, Table A1.5.1.

Table 5.3.1: Comparison of Average Percent of Primary Adult Decision-makers in the Phase One ZOI Achieving Adequacy in the Six A-WEAI Indicators using Censored Headcount Ratios, by Sex and Age, Feed the Future Phase One Baseline and Endline ZOI Surveys

A-WEAI indicator	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[a]	Sig.[b]
	%	95% CI	n	%	95% CI	n			
Women[c]									
Average[d]	34.08	32.77 – 35.89	1,850	18.83	17.41 – 20.25	1,831	-15.25	0.000	***
Age category									
18-29	34.47	32.13 – 36.80	508	20.40	17.00 – 23.80	323	-14.07	0.000	***
30+	33.94	32.37 – 35.51	1,342	18.51	16.95 – 20.07	1,508	-15.43	0.000	***
Men[e]									
Average[d]	37.11	35.50 – 38.72	1,601	23.33	21.68 – 25.00	1,565	-13.77	0.000	***
Age category									
18-29	39.87	35.54 – 44.19	202	28.42	22.49 – 34.36	138	-11.44	0.000	***
30+	36.76	35.03 – 38.49	1,399	22.95	21.23 – 24.68	1,427	-13.80	0.000	***

CI=confidence interval; Diff.=difference

[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

[c] Estimates for women exclude households that do not have a primary adult female decision-maker or that have missing or incomplete indicator data.

[d] Average percentage (censored headcount ratio)

[e] Estimates for men exclude households that do not have a primary adult male decision-maker or that have missing or incomplete indicator data.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on primary adult decision-makers who are de jure household members.

The Feed the Future ZOI context indicator, "Average percent of women achieving adequacy across the six indicators of the A-WEAI," is calculated as the sum of the censored headcount ratios for primary adult female decision-makers for each of the six A-WEAI indicators, divided by six (the number of indicators). It shows the average across the six indicators of the proportion of primary adult female decision-makers in the ZOI population who are disempowered but still achieved adequacy in an individual A-WEAI indicator.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table 5.3.2 presents the percentage of individuals in the Phase One ZOI achieving adequacy in each indicator, comparing estimates at 2011/2012 baseline and 2018/2019 endline. The proportion of women who are not yet empowered but have adequate achievement is lower than men at the 2018/2019 endline for all A-WEAI indicators except for workload and group membership. This pattern mostly holds for both age groups at baseline and endline. At 2011/2012 baseline and 2018/2019, adequacy levels of primary female decision-makers were highest in input in productive decisions and ownership of assets and lowest in access to and decisions on credit and group membership. Primary male decision-makers' highest achievements were related to ownership of assets and control over income and lowest achievement in adequacy was in group membership at 2018/2019 endline.

Table 5.3.2: Comparison of Adequate Achievement in Each A-WEAI Indicator in the Phase One ZOI Using Censored Headcount Ratios, by Sex and Age, Feed the Future Phase One Baseline and Endline ZOI Surveys

A-WEAI indicator and characteristic	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[a]	Sig.[b]
	%	95% CI	n	%	95% CI	n			
Women[c]									
Input in productive decisions	49.18	46.77 – 51.59	1,850	29.05	26.80 – 31.30	1,831	-20.13	0.000	***
Age category									
18-29	48.29	43.72 – 52.87	508	32.71	27.11 – 38.31	323	-15.58	0.000	***
30+	49.51	46.67 – 52.36	1,342	28.30	25.83 – 30.76	1,508	-21.21	0.000	***
Ownership of assets	40.26	37.89 – 42.61	1,850	28.44	0.26 – 30.67	1,831	-11.82	0.000	***
Age category									
18-29	40.00	35.52 – 44.49	508	30.60	25.08 – 36.11	323	-9.40	0.000	***
30+	40.35	37.57 – 43.13	1,342	28.00	25.54 – 30.43	1,508	-12.35	0.000	***
Access to and decisions on credit	19.14	17.24 – 21.04	1,850	5.05	3.91 – 6.19	1,831	-14.09	0.000	***
Age category									
18-29	21.66	17.93 – 25.40	508	5.28	2.48 – 8.09	323	-16.38	0.000	***
30+	18.21	16.00 – 20.42	1,342	5.00	3.75 – 6.25	1,508	-13.21	0.000	***
Control over income	43.27	40.87 – 45.66	1,850	27.09	24.89 – 29.29	1,831	-16.18	0.000	***
Age category									
18-29	42.76	38.22 – 47.29	508	32.03	26.45 – 37.60	323	-10.73	0.000	***
30+	43.45	40.64 – 46.27	1,342	26.07	23.67 – 28.46	1,508	-17.38	0.000	***
Group membership	10.58	9.07 – 12.08	1,850	6.64	5.37 – 7.91	1,831	-3.94	0.000	***
Age category									
18-29	10.86	8.06 – 13.65	508	6.46	3.24 – 9.68	323	-4.39	0.000	***
30+	10.47	8.69 – 12.26	1,342	6.68	5.30 – 8.06	1,508	-3.79	0.000	***
Workload	42.06	39.67 – 44.45	1,850	16.72	14.88 – 18.57	1,831	-25.34	0.000	***
Age category									
18-29	43.28	38.71 – 47.75	508	15.32	11.04 – 19.60	323	-27.96	0.000	***
30+	41.63	38.81 – 44.45	1,342	17.01	15.00 – 19.06	1,508	-24.62	0.000	***
Men[d]									
Input in productive decisions	54.66	52.08 – 57.23	1,601	33.31	30.80 – 35.82	1,565	-21.35	0.000	***
Age category									
18-29	53.23	45.87 – 60.60	202	37.40	28.36 – 46.43	138	-15.83	0.000	***

30+	54.83	52.09 – 57.58	1,399	33.00	30.39 – 35.62	1,427	-21.83	0.000	***
Ownership of assets	57.94	55.38 – 60.50	1,601	35.97	33.41 – 38.54	1,565	-21.97	0.000	***
Age category									
18-29	62.37	55.24 – 69.50	202	41.44	32.25 – 50.63	138	-20.93	0.000	***
30+	57.38	54.64 – 60.12	1,399	35.57	32.90 – 38.24	1,427	-21.81	0.000	***
Access to and decisions on credit	23.67	21.47 – 25.86	1,601	17.55	15.53 – 19.57	1,565	-6.12	0.000	***
Age category									
18-29	25.11	18.80 – 31.42	202	16.42	9.98 – 23.09	138	-8.69	0.000	***
30+	23.48	21.14 – 25.82	1,399	17.63	15.52 – 19.75	1,427	-5.85	0.000	***
Control over income	56.64	54.07 – 59.21	1,601	34.87	32.33 – 37.41	1,565	-21.77	0.000	***
Age category									
18-29	62.57	55.43 – 69.70	202	40.92	31.78 – 50.05	138	-21.65	0.000	***
30+	55.90	53.15 – 58.64	1,399	34.42	31.77 – 37.06	1,427	-21.48	0.000	***
Group membership	3.09	2.20 – 3.97	1,601	4.07	2.99 – 5.15	1,565	0.98	0.000	***
Age category									
18-29	3.36	0.76 – 5.95	202	6.70	1.99 – 11.40	138	3.34	0.000	***
30+	3.05	2.11 – 4.00	1,399	3.87	2.77 – 4.97	1,427	0.82	0.000	***
Workload	26.64	24.38 – 28.91	1,601	14.23	12.36 – 16.10	1,565	-12.41	0.000	***
Age category									
18-29	32.56	25.78 – 39.34	202	27.66	19.19 – 36.13	138	-4.90	0.000	***
30+	25.90	23.49 – 28.30	1,399	13.29	11.33 – 15.13	1,427	-12.61	0.000	***

CI=confidence interval; Diff.=difference

[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

[c] Estimates for women exclude households that do not have a primary adult female decision-maker or that have missing or incomplete indicator data.

[d] Estimates for men exclude households that do not have a primary adult male decision-maker or that have missing or incomplete indicator data.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on primary adult decision-makers who are de jure household members.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

5.4 Descriptive statistics for A-WEAI domains and indicators

This section presents more granular information on data collected in the A-WEAI ZOI Survey module. The sub-sections are organized by A-WEAI domains.

5.4.1 Production

Adequacy in *production* is measured by input into decisions about agricultural activities in which an individual participates. Respondents are considered adequate in production if they make decisions alone, have input into most or all decisions, or feel that they could make decisions if they wanted to for at least two agricultural activities.

Table 5.4.1 presents the percentages of women and men in the Phase One ZOI who are involved in economic and agriculture-related activities (that is, food crop farming, cash crop farming, livestock raising, fishing, non-farm economic activities, and wage or salaried employment), comparing estimates at 2011/2012 baseline and 2018/2019 endline, to capture the breadth of economic activities in which individuals are engaged in and any changes over time. **Table 5.4.2** presents the percentages of women and men in the Phase One ZOI who have input into the decisions made about specific activities, comparing estimates at baseline and at endline.

Between 2011/2012 baseline and 2018/2019 endline, women's participation in agricultural production activities increased, whereas engagement in non-farm activities and wage work decreased. At 2011/2012 baseline, the most prevalent economic activities among women were livestock raising (58.5 percent), food crop farming (40.9 percent), and cash crop farming (32.2 percent). At endline, 87.4 percent of women raised livestock, around three-quarters (73.1 percent) participated in food crop farming, and nearly half (48.1 percent) in cash crop farming. These increases are statistically significant at the 0.1 percent level. Conversely, women's participation in wage work was cut by more than half (from 23.7 percent to 11.3 percent).

Changes in participation in economic activities among men, on the other hand, are not statistically significant except for livestock raising. Among men, the most prevalent activities at 2011/2012 baseline were food crop farming (67.1 percent) and livestock raising (64.0 percent), followed by cash crop farming (52.1 percent). Except for a 14.4 percentage point increase in livestock raising (from 64.0 percent to 78.4 percent), men's participation in all other activities remained relatively static from 2011/2012 baseline to 2018/2019 endline.

Table 5.4.1: Comparison of Participation in Economic Activities, by Sex, Feed the Future Phase One Baseline and Endline ZOI Surveys

	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value [a]	Sig. [b]
Economic activity	%	95% CI	n	%	95% CI	n			
Women [c]									
Food crop farming	40.9	36.5 – 45.3	2,039	73.1	69.1 – 77.0	2,051	32.1	0.000	***
Cash crop farming	32.2	27.3 – 37.2	2,039	48.1	43.9 – 52.3	2,051	15.9	0.000	***
Livestock raising	58.5	54.4 – 62.6	2,039	87.4	85.0 – 89.9	2,051	28.9	0.000	***
Fishing or fishpond culture	13.0	10.3 – 15.8	2,039	17.4	14.2 – 20.6	2,051	4.4	0.009	**
Non-farm economic activities	19.9	16.5 – 23.2	2,039	13.7	11.4 – 15.9	2,051	-6.2	0.002	**
Wage or salaried employment	23.7	19.8 – 27.6	2,039	11.3	9.1 – 13.5	2,051	-12.4	0.000	***
Men [d]									
Food crop farming	67.1	63.2 – 71.1	1,727	66.3	62.3 – 70.3	1,755	-0.8	0.570	n/s
Cash crop farming	52.1	47.2 – 60.0	1,727	53.0	48.6 – 57.3	1,755	0.9	0.693	n/s
Livestock raising	64.0	60.2 – 67.9	1,727	78.4	74.9 – 81.9	1,755	14.4	0.000	***
Fishing or fishpond culture	26.3	21.6 – 30.9	1,727	25.2	20.9 – 29.4	1,755	-1.1	0.490	n/s
Non-farm economic activities	46.0	42.3 – 49.7	1,727	46.0	42.3 – 49.7	1,755	-0.1	0.973	n/s
Wage or salaried employment	48.0	44.2 – 51.8	1,727	45.9	42.3 – 49.4	1,755	-2.1	0.445	n/s

CI=confidence interval; Diff.=difference; n/s=not significant

[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[c] Estimates for women exclude households that do not have a primary adult female decision-maker or that have missing or incomplete indicator data.

[d] Estimates for men exclude households that do not have a primary adult male decision-maker or that have missing or incomplete indicator data.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on primary adult decision-makers who are de jure household members.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table 5.4.2 shows the changes in women's and men's input into decision making on production between 2011/2012 baseline and 2018/2019 endline. Overall, women's input into decision-making on production decreased for many activities except livestock raising. At 2011/2012 baseline, 88.6 percent of women had input into decision-making in livestock raising, which increased to 99.1 percent at 2018/2019 endline, and the change is statistically significant at the 0.1 percent level. Women's input into decision-making for participation in wage or salaried employment increased from 81.6 percent to 92.3 percent–a statistically significant increase at the 1 percent level. Women's input into decision-making in food crop farming observed a slight drop (83.0 percent to 81.3 percent), although this change was not statistically significant. Although women's participation in food crop farming and cash crop farming increased significantly between baseline and endline (**Table 5.4.1**), their input into decision-making regarding

those activities *decreased* between the two rounds. This indicates that, although more women participated in crop-related production activities, they may not necessarily have adequate decision-making power in those activities.

Similar to the results for men's *participation* in economic activities, the change in men's *input* into decision-making on production is either small in magnitude or statistically insignificant except livestock raising (significant at the 0.1 percent level). Men's input into decision-making on wage or salaried employment increased from 91.7 percent to 96.8 percent—statistically significant at the 0.1 percent level. Men's input into non-farm economic activities also increased from 91.9 percent to 95.7 percent, a statistically significant change at the 5 percent level.

Table 5.4.2: Comparison of Input into Decision-making on Production, by Sex, Feed the Future Phase One Baseline and Endline ZOI Surveys

	Baseline (2011/2012)			Endline (2018/2019)				p-	
Economic activity	%	95% CI	N	%	95% CI	N	Diff.	value[a]	Sig.[b]
Women[c]									
Food crop farming	83.0	79.2 – 86.9	810	81.3	78.1 – 84.6	1,445	-1.7	0.505	n/s
Cash crop farming	84.8	81.3 – 88.4	631	77.2	73.5 – 80.8	946	-7.7	0.005	**
Livestock raising	88.6	86.0 – 91.2	1,126	99.1	98.6 – 99.7	1,746	10.6	0.000	***
Fishing or fishpond culture	79.0	73.9 – 84.1	268	70.3	63.3 – 77.2	352	-8.7	0.050	n/s
Non-farm economic activities	87.1	83.3 – 90.8	386	87.1	82.5 – 91.7	276	0.0	0.991	n/s
Wage or salaried employment	81.6	76.6 – 86.5	477	92.3	87.6 – 97.0	240	10.7	0.001	**
Men[d]									
Food crop farming	95.9	94.1 – 97.6	1,123	96.3	94.8 – 97.9	1,143	0.5	0.691	n/s
Cash crop farming	95.9	94.1 – 97.6	875	96.3	94.8 – 97.9	915	0.5	0.691	n/s
Livestock raising	90.3	87.8 – 92.7	1,062	99.4	98.8 – 100.0	1,354	9.1	0.000	***
Fishing or fishpond culture	94.3	90.8 – 97.8	455	95.2	92.9 – 97.5	435	0.9	0.664	n/s
Non-farm economic activities	91.9	89.4 – 94.4	772	95.7	94.2 – 97.3	780	3.8	0.014	*
Wage or salaried employment	91.7	89.3 – 94.2	824	96.8	95.4 – 98.2	809	5.1	0.000	***

CI=confidence interval; Diff.=difference; n=number; n/s=not significant
[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.
[c] Estimates for women exclude households that do not have a primary adult female decision-maker or that have missing or incomplete indicator data.
[d] Estimates for men exclude households that do not have a primary adult male decision-maker or that have missing or incomplete indicator data.
Notes:
Estimates are sample-weighted; numbers of observations are unweighted.
Estimates are based on primary adult decision-makers who are de jure household members.
Having input means that the individual reported having input into most or all decisions regarding the activity.
Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

5.4.2 Resources

Adequacy in *Resources* is measured by two indicators: (1) ownership of assets, and (2) access to and decisions related to credit. Women and men are considered adequate in asset ownership if they own alone or jointly at least two small assets or one large asset. They are considered adequate in access to

credit if they decide alone or jointly whether to borrow cash or in-kind or what to do with the money or item borrowed. **Table 5.4.3** presents ownership of assets in the Phase One ZOI, comparing estimates at baseline and at endline.

Overall, the results show a considerable gender disparity in the ownership of productive resources. Although this disparity prevails between survey rounds, women's ownership of many productive resources improved substantially between 2011/2012 baseline and 2018/2019 endline.

Among women in the Feed the Future ZOI, commonly owned 'productive resources' at 2011/2012 baseline included poultry (for example, chickens, ducks, turkeys, and pigeons) (65.5 percent), small consumer durables (43.9 percent), and small livestock (14.3 percent). Compared with men, few women (4.5 percent) solely or jointly owned fishpond or fishing equipment at 2011/2012 baseline, which increased slightly by the 2018/2019 endline (6.9 percent)—an increase that is statistically significant at the 5 percent level.

Women's ownership of certain productive resources improved substantially, including large livestock and small livestock (by 7.6 percentage points and 8.1 percentage points, respectively), poultry (by 6.6 percentage points), small and large consumer durables (by 50.1 and 55.3 percentage points, respectively), and cell phones (by 38.7 percentage points). All these changes are statistically significant at the 0.1 percent level. Changes in women's ownership of land—both agricultural and non-agricultural—are not statistically significant.

Among men, there were few statistically significant changes in their ownership of productive resources between 2011/2012 baseline and 2018/2019 endline. This is likely due to the high proportion of men owning most of these resources at baseline. Select exceptions include the ownership of a house or other structure, which increased from 84.1 percent to 91.9 percent—an increase statistically significant at the 0.1 percent level; and a rise in the ownership of poultry (from 32.5 percent to 49.6 percent)– changes are statistically significant at the 0.1 percent level.

Table 5.4.3: Comparison of Ownership of Productive Resources, by Sex, Feed the Future Phase One Baseline and Endline ZOI Surveys

Productive resource	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[a]	Sig.[b]
	%	95% CI	n	%	95% CI	n			
Woman owns solely or jointly[c]									
Agricultural land	7.7	6.4 – 9.0	2,038	9.7	7.9 – 11.6	2,051	2.0	0.036	*
Large livestock	16.3	14.0 – 18.7	2,038	24.0	21.1 – 26.8	2,051	7.6	0.000	***
Small livestock	14.3	12.0 – 16.7	2,038	22.4	18.9 – 25.9	2,051	8.1	0.000	***
Chickens, ducks, turkeys, and pigeons	65.5	62.3 – 68.7	2,038	72.1	69.1 – 75.0	2,051	6.6	0.000	***
Fishpond or fishing equipment	4.5	3.3 – 5.8	2,038	6.9	5.3 – 8.5	2,051	2.3	0.020	*
Non-mechanized farm equipment	13.4	9.7 – 17.1	2,038	36.9	32.2 – 41.6	2,051	23.5	0.000	***
Mechanized farm equipment	0.8	0.4 – 1.3	2,038	4.4	3.0 – 5.9	2,051	3.6	0.000	***
Non-farm business equipment	1.6	0.9 – 2.4	2,038	5.6	3.9 – 7.2	2,051	3.9	0.000	***
House or other structures	13.3	11.3 – 15.2	2,038	18.3	15.7 – 20.9	2,051	5.0	0.002	**
Large consumer durables	8.1	6.0 – 10.3	2,038	63.4	58.9 – 67.9	2,051	55.3	0.000	***
Small consumer durables	43.9	37.6 – 50.3	2,038	94.1	92.7 – 95.5	2,051	50.1	0.000	***
Cell phone	20.4	18.1 – 22.8	2,038	59.1	55.8 – 62.5	2,051	38.7	0.000	***
Non-agricultural land	4.6	3.1 – 6.1	2,038	1.6	0.9 – 2.3	2,051	-3.1	0.000	***
Means of transportation	2.5	1.6 – 3.4	2,038	7.1	5.5 – 8.6	2,051	4.5	0.000	***
Man owns solely or jointly[d]									
Agricultural land	50.7	46.7 – 54.7	1,727	55.1	50.9 – 59.2	1,755	4.4	0.137	n/s
Large livestock	45.2	41.3 – 49.1	1,727	43.6	39.4 – 47.7	1,755	-1.6	0.581	n/s
Small livestock	20.3	16.7 – 23.9	1,727	26.0	21.8 – 30.3	1,755	5.7	0.056	n/s
Chickens, ducks, turkeys, and pigeons	32.5	29.0 – 35.9	1,727	49.6	45.0 – 54.2	1,755	17.1	0.000	***
Fishpond or fishing equipment	26.9	22.1 – 31.6	1,727	31.4	26.7 – 36.5	1,755	4.5	0.216	n/s
Non–mechanized farm equipment	49.9	43.0 – 56.8	1,727	79.4	75.3 – 83.4	1,755	29.5	0.000	***
Mechanized farm equipment	12.2	9.2 – 15.1	1,727	20.7	17.0 – 24.4	1,755	8.5	0.001	**
Non–farm business equipment	19.0	16.1 – 21.9	1,727	20.3	17.6 – 23.0	1,755	1.3	0.522	n/s
House or other structures	84.1	81.8 – 86.5	1,727	91.9	90.4 – 93.4	1,755	7.8	0.000	***
Large consumer durables	20.1	16.9 – 23.3	1,727	76.3	71.4 – 81.3	1,755	56.2	0.000	***
Small consumer durables	43.3	36.9 – 49.7	1,727	85.9	82.4 – 89.3	1,755	42.6	0.000	***
Cell phone	64.5	61.7 – 67.4	1,727	88.7	86.7 – 90.7	1,755	24.2	0.000	***
Non–agricultural land	33.8	25.9 – 41.7	1,727	5.0	3.7 – 6.3	1,755	-28.8	0.000	***
Means of transportation	36.0	31.5 – 40.4	1,727	46.7	41.9 – 51.5	1,755	10.7	0.007	**

CI=confidence interval; Diff.=difference; n/s=not significant

[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.
[c] Estimates for women exclude households that do not have a primary adult female decision-maker or that have missing or incomplete indicator data.
[d] Estimates for men exclude households that do not have a primary adult male decision-maker or that have missing or incomplete indicator data.
Notes:
Estimates are sample–weighted; numbers of observations are unweighted.
Estimates are based on primary adult decision-makers who are de jure household members.
Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table 5.4.4 and **Table 5.4.5** show the second indicator of the *Resources* domain—access to and decision-making on credit. **Table 5.4.4** presents the percentage of women and men in the Phase One ZOI who report that a member of their household received any loan in the 12 months preceding the ZOI Surveys, comparing estimates at 2011/2012 baseline and 2018/2019 endline. The in-kind and cash loan categories are not mutually exclusive; a household could have received both types of loans. For women and men living in households that received a loan, the table also presents the percentages of women and men who report to have contributed to the decision to take the loan or the decisions on how to use the loan. **Table 5.4.5** presents the sources of credit accessed by households in the 12 months preceding the ZOI Surveys, comparing estimates at baseline and at endline.

The percentage of households with primary female adults receiving a loan increased from nearly two-thirds (64.4 percent) at 2011/2012 baseline to three-quarters (75.6 percent) at 2018/2019 endline—an increase that is statistically significant at the 0.1 percent level. This applied mostly to cash loans. Although the change in women's input on *how* to use a loan is not statistically significant, the percentage of women who contributed to the decision on *whether* to borrow increased from 70.4 percent to 78.3 percent—a change that is statistically significant at the 1 percent level.

The percentage of households with primary male adults receiving loans increased from 68.3 percent to 80.0 percent, which is statistically significant at the 0.1 percent level. Most loans were cash-based, whereas in-kind loans decreased by 4.8 percentage points. The percentage of men who contributed to deciding to borrow increased from 85.1 percent to 91.0 percent, and how to use a loan from 86.1 percent to 92.3 percent—both changes are statistically significant at the 1 percent level.

Table 5.4.4: Comparison of Credit Access, by Sex, Feed the Future Phase One Baseline and Endline ZOI Surveys

Characteristic	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[a]	Sig.[b]
	%	95% CI	n	%	95% CI	N			
Women[c]									
Household received a loan									
Any loan	64.4	61.3 – 67.4	2,040	75.6	73.1 – 78.1	2,051	11.2	0.000	***
In-kind loan	1.3	0.3 – 2.4	2,040	1.0	0.4 – 1.5	2,051	-0.3	0.571	n/s
Cash loan	63.8	60.8 – 66.8	2,040	75.2	72.7 – 77.6	2,051	11.4	0.000	***
Woman contributed to credit decision									
Any decision	72.5	68.0 – 76.9	1,262	79.9	76.1 – 83.8	1,483	7.4	0.009	**
On whether to borrow	70.4	65.9 – 75.0	1,262	78.3	74.3 – 82.2	1,483	7.8	0.009	**
On how to use loan	69.3	64.8 - 73.8	1,262	74.8	70.3 – 79.3	1,483	5.5	0.074	n/s
Men[d]									
Household received a loan									
Any loan	68.3	64.8 – 71.8	1,727	80.0	77.5 – 82.5	1,755	11.7	0.000	***
In-kind loan	5.1	2.5 – 7.8	1,727	0.4	0.1 – 0.7	1,755	-4.8	0.000	***
Cash loan	66.7	63.3 – 70.0	1,727	79.8	77.4 – 82.3	1,755	13.2	0.000	***
Man contributed to credit decision									
Any decision	87.3	84.3 – 90.2	1,158	92.6	90.5 – 94.6	1,369	5.3	0.004	**
On whether to borrow	85.1	81.9 – 88.3	1,158	91.0	88.8 – 93.3	1,369	5.9	0.003	**
On how to use loan	86.1	83.1 – 89.1	1,158	92.3	90.1 – 94.4	1,369	6.2	0.001	**

CI=confidence interval; Diff.=difference; n=number; n/s=not significant

[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[c] Estimates for women exclude households that do not have a primary adult female decision-maker or that have missing or incomplete indicator data.

[d] Estimates for men exclude households that do not have a primary adult male decision-maker or that have missing or incomplete indicator data.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on primary adult decision-makers who are de jure household members.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table 5.4.5 shows an upward trend in access to credit from various sources, except for formal lending, which declined for households with both female and male adults between 2011/2012 baseline and 2018/2019 endline. NGOs still provide most loans to households with female adults at the 2018/2019 endline, which increased from 42.2 percent to 57.1 percent. Nevertheless, access to credit from informal lenders increased from 6.5 percent at 2011/2012 baseline to 14.6 percent at 2018/2019 endline, as did loans received from friends and relatives (from 23.4 percent to 35.0 percent)—these differences are statistically significant at the 0.1 percent level.

NGOs represented the major credit source to households with male adults, with an increase from 38.6 percent to 54.5 percent. Friends and family became a more prominent credit source for ZOI

households at endline, increasing from 21.7 percent to 33.4 percent. Similarly, informal credit/savings groups grew in popularity over time (from 0.5 percent to 3.9 percent).

Table 5.4.5: Comparison of Source of Credit Accessed, by Sex, Feed the Future Phase One Baseline and Endline ZOI Surveys

	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[b]	Sig.[c]
Credit source	%[a]	95% CI	N	%[a]	95% CI	N			
Women[d]									
Any source	64.4	61.3 – 67.4	2,040	75.6	73.1 – 78.0	2,051	11.2	0.000	***
Nongovernmental organization	42.2	39.1 – 45.4	2,040	57.1	54.1 – 60.2	2,051	14.9	0.000	***
Informal lender	6.5	4.7 – 8.2	2,040	14.6	11.9 – 17.2	2,051	8.1	0.000	***
Formal lender	13.8	11.4 – 16.2	2,040	10.0	8.2 – 11.9	2,051	-3.7	0.007	**
Friends or relatives	23.4	20.7 – 26.1	2,040	35.0	31.8 – 38.3	2,051	11.6	0.000	***
Group-based micro-finance	—	—	—	—	—	—	—	—	—
Informal credit/savings groups	0.7	0.0 – 1.5	2,040	0.9	0.4 – 1.3	2,051	0.1	0.757	n/s
No credit needed	—	—	—	—	—	—	—	—	—
Men[e]									
Any source	68.3	64.8 – 71.8	1,727	80.0	77.5 – 82.4	2,051	11.7	0.000	***
Nongovernmental organization	38.6	35.2 – 42.1	1,727	54.5	51.2 – 57.8	2,051	15.9	0.000	***
Informal lender	13.6	10.7 – 16.4	1,727	16.3	13.2 – 19.3	1,755	2.7	0.202	n/s
Formal lender	23.8	20.4 – 27.1	1,727	16.0	13.4 – 18.6	1,755	-7.8	0.001	**
Friends or relatives	21.7	18.7 – 24.6	1,727	33.4	29.1 – 37.6	1,755	11.7	0.000	***
Group-based micro-finance	—	—	—	—	—	—	—	—	n/a
Informal credit/savings groups	0.5	0.1 – 0.9	1,727	3.9	2.2 – 5.5	1,755	3.4	0.000	***
No credit needed	—	—	—	—	—	—	—	—	n/a

CI=confidence interval; Diff.=difference; n/s=not significant

— = Data are not available as these data were not collected.

[a] Percentages may sum to more than 100 percent for women and men because loans may have been received from more than one source.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[d] Estimates for women exclude households that do not have a primary adult female decision-maker or that have missing or incomplete indicator data.

[e] Estimates for men exclude households that do not have a primary adult male decision-maker or that have missing or incomplete indicator data.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on primary adult decision-makers who are de jure household members.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

5.4.3 Income

Adequacy in *income* is measured by input into decisions related to income and expenditures. Women and men are considered adequate if they have substantial input into most or all decisions or feel that they can decide for at least one economic activity or major household expenditures. **Table 5.4.6** presents the percentages of women and men in the Phase One ZOI who have input into the decisions made regarding the use of income derived from an activity, comparing estimates at 2011/2012 baseline and 2018/2019 endline.

Data in **Table 5.4.6** suggest that women's increased participation in certain economic activities did not consistently translate to improved input into decision-making on use of income from that activity. For example, despite enhanced women's participation in both economic activities, the change in women's input into decision-making on use of income from food crop farming is not statistically significant and cash crop farming decreased by 6.1 percentage points, which is statistically significant at the 5 percent level. Similarly, although women's participation in wage or salaried employment dropped between 2011/2012 baseline and 2018/2019 endline, women's input into decision-making on use of that income increased by 10.6 percentage points.

Conversely, livestock raising presents significant potential for women's economic empowerment, with enhanced women's participation and improved input into decision-making on use of income from this activity—a statistically significant change at the 0.1 percent level. There were no substantial changes in men's input into decision-making on use of income across all economic activities.

Table 5.4.6: Comparison of Input into Decision-making on Use of Income and Major Household Expenditures, by Sex, Feed the Future Phase One Baseline and Endline ZOI Surveys

	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[b]	Sig.[c]
Economic Activity	%[a]	95% CI	n	%[a]	95% CI	n			
Women[c]									
Food crop farming	82.1	78.2 – 86.0	806	81.5	78.7 – 84.3	1,420	-0.6	0.787	n/s
Cash crop farming	82.7	78.1 – 87.3	630	76.5	73.1 – 80.0	940	-6.1	0.024	*
Livestock raising	85.7	82.9 – 88.6	1,108	98.8	98.1 – 99.4	1,724	13.0	0.000	***
Fishing or fishpond culture	79.2	74.1 – 84.3	265	66.5	59.6 – 73.3	344	-12.7	0.007	**
Non-farm economic activities	84.7	80.1 – 89.3	384	87.4	82.8 – 92.0	274	2.7	0.375	n/s
Wage or salaried employment	83.7	79.4 – 88.1	474	94.3	90.8 – 97.8	239	10.6	0.000	***
Men[d]									
Food crop farming	95.0	93.2 – 96.9	1,116	95.4	93.9 – 96.8	1,139	0.4	0.761	n/s
Cash crop farming	95.7	93.8 – 97.5	872	96.4	95.0 – 97.8	914	0.7	0.537	n/s
Livestock raising	91.6	89.4 – 93.8	1,040	99.2	98.7 – 99.7	1,350	7.6	0.000	***
Fishing or fishpond culture	96.0	92.9 – 99.2	448	95.3	93.0 – 97.6	432	-0.7	0.696	n/s
Non-farm economic activities	93.6	91.3 – 95.9	771	95.7	94.1 – 97.2	779	2.0	0.157	n/s
Wage or salaried employment	94.5	92.3 – 96.8	821	97.1	95.5 – 98.5	809	2.5	0.054	n/s

CI=confidence interval; Diff.=difference; n/s=not significant

[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[c] Estimates for women exclude households that do not have a primary adult female decision-maker or that have missing or incomplete indicator data.

[d] Estimates for men exclude households that do not have a primary adult male decision-maker or that have missing or incomplete indicator data.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on primary adult decision-makers who are de jure household members.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

5.4.4 Leadership

Adequacy in *Leadership* is measured through an individual's active involvement with community groups. Women and men are considered adequate if they are active members of at least one community group. **Table 5.4.7** presents the percentages of women and men in the Phase One ZOI who were active members of groups in their community, comparing estimates at baseline and at endline.

Women's and men's group membership grew dramatically across many types of groups between 2011/2012 baseline and 2018/2019 endline. Overall, women's group membership nearly doubled (from 33.9 percent to 64.4 percent), with the greatest increases coming from water users' groups (0.1 percent to 8.3 percent), credit or microfinance groups (31.5 percent to 48.3 percent), and religious groups (2.7 percent to 27.1 percent) at the 0.1 percent level. Similarly, men's group membership more than doubled, from 16.8 percent at 2011/2012 baseline to 40.8 percent at 2018/2019 endline, with statistically significant increases in the same types of groups as observed for women's group membership.

Table 5.4.7: Comparison of Group Membership, by Sex, Feed the Future Phase One Baseline and Endline ZOI Surveys

	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[b]	Sig.[c]
Type of group	%	95% CI	n[a]	%	95% CI	n[a]			
Women[d]									
Any group	33.9	29.4 – 38.4	2,039	64.4	60.7 – 68.2	2,051	30.5	0.000	***
Agricultural producers' group	0.2	0.0 – 0.3	2,039	0.7	0.3 – 1.1	2,051	0.6	0.010	*
Water users' group	0.1	0.0 – 0.3	2,039	8.3	5.7 – 11.1	2,051	8.2	0.000	***
Forest users' group	0.1	0.0 – 0.2	2,039	0.3	0.1 – 0.6	2,051	0.2	0.133	n/s
Credit or micro-finance group	31.5	27.2 – 35.8	2,039	48.3	44.7 – 51.9	2,051	16.8	0.000	***
Mutual help or insurance group	0.2	0.0 – 0.4	2,039	0.6	0.1 – 1.1	2,051	0.4	0.092	n/s
Trade and business association	0.2	0.0 – 0.4	2,039	0.7	0.2 – 1.3	2,051	0.5	0.080	n/s
Civic or charitable group	0.2	0.0 – 0.4	2,039	0.2	0.0 – 0.4	2,051	0.0	0.857	n/s
Local government	0.3	0.0 – 0.6	2,039	1.2	0.6 – 1.8	2,051	0.9	0.002	**
Religious group	2.7	1.0 – 4.3	2,039	27.1	23.8 – 30.4	2,051	24.4	0.000	***
Other women's group	0.2	0.0 – 0.3	2,039	0.8	0.3 – 1.3	2,051	0.6	0.019	*
Other*	0.2	0.0 – 0.3	2,039	0.0	n/a	2,051	-0.2	0.091	n/s
Men[e]									
Any group	16.8	13.9 – 19.8	1,727	40.8	36.6 – 45.1	1,755	24.0	0.000	***
Agricultural producers' group	1.3	0.5 – 2.1	1,727	3.2	1.9 – 4.5	1,755	1.9	0.007	**
Water users' group	0.6	0.0 – 1.1	1,727	8.6	5.6 – 11.6	1,755	8.0	0.000	***
Forest users' group	0.4	-0.2 – 1.1	1,727	0.2	0.0 – 0.4	1,755	-0.2	0.494	n/s
Credit or micro-finance group	4.0	2.6 – 5.5	1,727	16.9	14.0 – 19.8	1,755	12.8	0.000	***
Mutual help or insurance group	1.0	0.4 – 1.6	1,727	1.7	0.7 – 2.7	1,755	0.6	0.145	n/s
Trade and business association	2.4	1.5 – 3.2	1,727	3.6	1.9 – 5.3	1,755	1.2	0.139	n/s
Civic or charitable group	0.7	0.3 – 1.1	1,727	0.4	0.1 – 0.7	1,755	-0.3	0.139	n/s
Local government	0.7	0.2 – 1.2	1,727	3.6	2.2 – 4.9	1,755	2.9	0.000	***
Religious group	8.7	6.6 – 10.9	1,727	18.9	15.9 – 22.0	1,755	10.2	0.000	***
Other*	1.1	0.6 – 1.7	1,727	0.0	n/a	1,755	-1.1	0.000	***

CI=confidence interval; Diff.=difference; n=number; n/a=not applicable; n/s=not significant.

*The 95% CI is reported as 'n/a' because the endline estimate is 0.0; therefore, a 95% CI cannot be generated.

[a] Estimates include all interviewed individuals, even those who reported that no group exists or that they are unaware of the existence of a group in their community. These individuals, who report that none of the groups exist or who are unaware of any groups, are counted as having inadequate achievement in this empowerment indicator.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[d] Estimates for women exclude households that do not have a primary adult female decision-maker or that have missing or incomplete indicator data.

[e] Estimates for men exclude households that do not have a primary adult male decision-maker or that have missing or incomplete indicator data.

Notes: Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on primary adult decision-makers who are de jure household members.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

5.4.5 Time

Adequacy in the last domain, *Time,* assesses the workloads of women and men, as measured using a time allocation log. Women and men are considered adequate if they spend 10.5 hours or less performing work activities in a 24-hour period. **Table 5.4.8** presents the percentages of women and men who performed the listed activities the day prior to the date of interview and the average number of hours that they spent performing each activity; estimates from 2011/2012 baseline and 2018/2019 endline are then compared. The percentages indicate those individuals who reported performing the activity, irrespective of the length of time that they spent performing the activity. The average hours spent performing an activity is the average across all individuals, assigning zero hours to individuals who did not perform an activity.

Unsurprisingly, activities like sleeping, eating, and personal care remained consistent between 2011/2012 baseline and 2018/2019 endline. Other activities, however, changed substantially.

For example, the percentage of men and women engaged in farming, livestock, and fishing both increased: the percentage of women increased 16-fold, from 4.5 percent to over three-quarters (69.3 percent), and the percentage of men engaged in these agricultural activities was 1.5-times higher by 2018/2019 endline, increasing from 34.0 percent to 52.2 percent.

Another example is the dramatic increase in the time spent on social activities and hobbies by men and women. The percentage of men who spent any part of the previous day on social activities and hobbies grew from one-third at 2011/2012 baseline (30.9 percent) to three-quarters (74.1 percent) at 2018/2019 endline, and men's mean hours devoted to this activity increased from 38 minutes to 2 hours and 17 minutes. Along the same vein, the percentage of women engaged in social activities and hobbies increased from 19.1 percent to 83.7 percent. Also, men and women spent more time on religious activities at 2018/2019 endline versus 2011/2012 baseline.

Table 5.4.8: Comparison of Time Allocation, by Sex, Feed the Future Phase One Baseline and Endline ZOI Surveys

Activity	Performed activity (%)		Mean hours devoted (hours:minutes)	
	Baseline (2011/2012)	Endline (2018/2019)	Baseline (2011/2012)	Endline (2018/2019)
Women[a]				
Sleeping and resting	100.0	100.0	9:03	9:08
Eating and drinking	100.0	99.9	1:55	1:17
Personal care	95.6	100.0	1:22	1:25
School and homework[b]	4.9	2.6	0:05	0:02
Work as employed[b]	3.6	3.3	0:12	0:11
Own business work[b]	2.1	4.9	0:05	0:08
Farming, livestock, fishing[b]	4.5	69.3	0:08	1:26
Shopping, getting services[b]	1.2	5.5	0:01	0:04
Weaving, sewing, textile caro[b]	10.1	9.1	0:16	0:13
Cooking[b]	93.0	88.3	2:42	2:03

Activity	Performed activity (%)		Mean hours devoted (hours:minutes)	
	Baseline (2011/2012)	Endline (2018/2019)	Baseline (2011/2012)	Endline (2018/2019)
Domestic work (fetching food and water)[b]	98.4	97.4	4:42	3:08
Care for children, adults, elderly[b]	45.5	57.8	0:56	1:14
Commuting (for work or school)[b,*]	10.5	—	0:11	—
Travel (not for work or school)	7.4	28.0	0:09	0:21
Watching TV, listening to radio, reading	11.5	29.9	0:13	0:34
Exercising	2.7	5.2	0:02	0:03
Social activities and hobbies	19.1	83.7	0:14	2:01
Religious activities	53.9	59.2	0:37	1:05
Other	2.6	0.8	0:03	0:01
Number of women	2,039	2,051		
Men[c]				
Sleeping and resting	100.0	99.9	9:00	9:22
Eating and drinking	99.7	99.6	1:35	1:19
Personal care	96.9	99.9	1:26	1:13
School and homework[b]	4.3	4.0	0:03	0:05
Work as employed[b]	23.5	23.8	1:42	1:50
Own business work[b]	31.1	30.1	2:24	2:24
Farming, livestock, fishing[b]	34.0	52.2	1:47	2:31
Shopping, getting services[b]	20.8	25.2	0:28	0:24
Weaving, sewing, textile care[b]	1.5	0.5	0:02	0:01
Cooking[b]	1.5	0.7	0:02	0:00
Domestic work (fetching food and water)[b]	50.7	21.2	1:36	0:25
Care for children, adults, elderly[b]	11.6	12.1	0:12	0:07
Commuting (for work or school)[b]	28.3	—	0:30	—
Travel (not for work or school)	6.9	70.0	0:11	1:02
Watching TV, listening to radio, reading	19.9	27.6	0:28	0:29
Exercising	5.2	7.1	0:04	0:06
Social activities and hobbies	30.9	74.1	0:38	2:17
Religious activities	38.5	43.8	0:29	0:46
Other	3.8	1.8	0:07	0:02
Number of men	1,726	1,755		

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[a] Estimates for women exclude households that do not have a primary adult female decision-maker or that have missing or incomplete indicator data.

[b] Activities considered to be work in the A-WEAI calculations.

[c] Estimates for men exclude households that do not have a primary adult male decision-maker or that have missing or incomplete indicator data.

Notes:

The WEAI questionnaire was updated at the endline to combine the activity categories of "commute (for work or school)" and "travel (not for work or school)" at baseline into a single category of "travel" at the endline. This caused the share of performed activity and mean hours of travel time to increase dramatically at endline compared to baseline.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on primary adult decision-makers who are de jure household members.

6. HUNGER AND DIETARY INTAKE

This chapter presents findings related to hunger and women's and young children's dietary intake in the Phase One ZOI.

6.1 Household hunger

The experience of food insecurity is characterized by uncertainty and anxiety regarding food access and changes in the *quality* of the diet (that is, less balanced and monotonous diets). As food insecurity becomes severe, the *quantity* of food consumed by the household decreases as the portion sizes are reduced and meals are skipped, and when food insecurity is most severe, individuals are forced to go without eating. The Household Hunger Scale is used to assess, geographically target, monitor, and evaluate hunger in settings affected by substantial food insecurity.

The HHS is used to measure the prevalence of households in the Phase One ZOI experiencing moderate or severe hunger. The HHS was developed by the USAID-funded Food and Nutrition Technical Assistance II Project (FANTA-2/FHI 360) in collaboration with the United Nations Food and Agriculture Organization. It has been cross-culturally validated to allow comparison across different food-insecure contexts.[48] The HHS is used to estimate the percentage of households affected by severity: little to no household hunger (HHS score 0–1), moderate household hunger (HHS score 2–3), and severe household hunger (HHS score 4–6). The HHS should be measured at the same time each year and, ideally, at the most vulnerable time of year, such as right before the harvest or during the dry season.[49,50]

Historically, the hungry (or lean) season in Bangladesh occurs twice a year: (1) September-October, and (2) March-April. Data for the HHS at baseline were collected in the ZOI from October 25, 2011 to March 15, 2012, and data for HHS at endline were collected from November 11, 2018 to February 6, 2019. As explained in Section 2.1.3, the severity of the traditional lean seasons has reduced to a great extent in the past couple of decades due to various consumption-smoothing factors. Thus, IFPRI researchers conclude that seasonal issues did not affect the comparability of the HHS estimates between the ZOI baseline and endline surveys.

Table 6.1 presents estimates of household hunger in the Phase One ZOI, comparing 2011/2012 baseline and 2018/2019 endline for all households, as well as by gendered household type, household educational attainment, and poverty status.[51]

Most households in the Bangladesh ZOI experienced little or no hunger at baseline and endline. The proportion of households facing little or no hunger increased from 92.1 percent at the 2011/2012

[48] Ballard, Coates, Swindale, and Deitchler (2011)

[49] Deitchler, Ballard, Swindale, and Coates (2011)

[50] A more detailed description of the household hunger indicator and its calculation is given in the Feed the Future Indicator Handbook, available at: http://feedthefuture.gov/resource/feed-future-handbook-indicator-definitions.

[51] Confidence intervals for baseline and endline estimates, differences between baseline and endline estimates, and p-values for the differences for each HHS category are tabulated and presented in Appendix 1, Tables A1.6.1.1 through A1.6.1.4.

baseline to 97.5 percent at 2018/2019 endline. Conversely, moderate or severe hunger decreased from 7.9 percent at baseline to 2.5 percent at the endline.

Moderate or severe hunger decreased across disaggregation categories between the baseline and endline. Female adult only households experienced a remarkable decline in moderate or severe hunger from 12.9 percent at baseline to 4.5 percent at endline. For both rounds, there is a distinct dose-response relationship between moderate or severe hunger and education, with increasing levels of education corresponding to lower incidence of hunger. Households with no education are at the greatest risk of experiencing moderate or severe hunger, as 11.7 percent of these households still faced hunger at the 2018/2019 endline. Although the incidence of moderate or severe hunger reduced in poor households from 15.0 percent at baseline to 6.6 percent at endline, the poor remain at high risk of facing hunger.

Tables A.6.1.1 to **A.6.1.4** in Appendix A present results from tests of differences in means between baseline and endline for each hunger category. The decline in moderate or severe hunger in the Bangladesh ZOI between the two rounds is statistically significant at the 0.1 percent level.

Table 6.1: Comparison of Household Hunger in the Phase One ZOI, by Severity, in Total and by Selected Household Characteristics, Feed the Future Phase One Baseline and Endline ZOI Surveys

Characteristic	Baseline (2011/2012)					Endline (2018/2019)				
	Little to none (%)	Moderate (%)	Severe (%)	Moderate or severe (%)	n[a]	Little to none (%)	Moderate (%)	Severe (%)	Moderate or severe (%)	n[a]
All households	92.1	7.0	1.0	7.9	2,040	97.5	2.2	0.3	2.5	2,064
Gendered household type										
Male and female adults	92.9	6.3	0.8	7.1	1,751	97.9	1.9	0.2	2.1	1,738
Female adults only	87.1	11.2	1.7	12.9	283	95.5	3.5	1.0	4.5	313
Male adults only	^	^	^	^	6	^	^	^	^	12
Children only	^	^	^	^	0	^	^	^	^	1
Household education										
No education	80.0	17.9	2.1	20.0	137	88.3	9.1	2.6	11.7	121
Less than primary	84.2	14.3	1.5	15.8	376	95.8	4.2	0.0	4.2	204
Completed primary	94.8	4.4	0.8	5.2	1,084	97.6	2.1	0.3	2.4	1,088
Completed secondary	95.7	4.3	0.0	4.3	231	99.5	0.5	0.0	0.5	321
Higher	96.2	2.9	0.9	3.8	212	99.7	0.3	0.0	0.3	330
Poverty status										
Poor	85.0	12.8	2.3	15.0	758	93.4	5.9	0.8	6.6	444
Non-poor	96.3	3.5	0.2	3.7	1,282	98.6	1.2	0.2	1.4	1,620

n=number

^ Results not statistically reliable, n<30

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregate categories based on individual household members (i.e., gendered household type, household education, and poverty status) are calculated using de jure household members.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019

6.2 Women's dietary diversity

This section presents information on the dietary diversity of women of reproductive age (15-49 years) in the Phase One ZOI.

Women of reproductive age are at risk of multiple micronutrient deficiencies, which can jeopardize their health and their ability to care for their children and participate in income-generating activities.[52] The Phase One Feed the Future women's dietary diversity indicator—the mean women's dietary diversity score (WDDS)—is a proxy for the probability of micronutrient adequacy of women's diets. The indicator reports the mean number of food groups that women of reproductive age consumed during the day and night preceding the survey.

The WDDS indicator is calculated using nine food groups: (1) grains, roots, and tubers; (2) legumes and nuts; (3) dairy products; (4) organ meat; (5) eggs; (6) flesh food and small animal protein; (7) vitamin A-rich dark green leafy vegetables; (8) other vitamin A-rich vegetables and fruits; and (9) other fruits and vegetables. The number of food groups that each woman consumed the day and night preceding the survey is averaged across all women of reproductive age in the sample for whom dietary diversity data were collected to produce the mean WDDS.

Table 6.2.1 presents WDDS estimates for all women of reproductive age in the Phase One ZOI, comparing estimates at baseline and at endline. The estimates are shown for all women and by selected characteristics—women's age groups, women's educational attainment, gendered household type, poverty status, and household hunger.

In the Bangladesh ZOI, the WDDS indicator value increased from 4.4 to 4.9 food groups between 2011/2012 baseline and 2018/2019 endline. Women's average consumption of the nine food groups increased by 0.6 food groups, or by 12.9 percent. This change is statistically significant at the 0.1 percent level.

WDDS increased across all levels of disaggregation between 2011/2012 baseline and 2018/2019 endline. In general, the trend indicates that WDDS decreases as women's age increases across both survey rounds, and WDDS increases along with improvements in women's educational attainment. WDDS increased more among adult female only households compared with dual-adult households between 2011/2012 baseline and 2018/2019 endline.

Women of reproductive age from poor households have lower WDDS compared with those in non-poor households at both 2011/2012 baseline and 2018/2019 endline. Similarly, WDDS in households suffering from moderate hunger was lower than WDDS in households facing little or no hunger in both survey rounds.

[52] Darnton-Hill et al. (2005)

Table 6.2.1: Comparison of Mean Number of Food Groups Consumed by Women of Reproductive Age in the Phase One ZOI, in Total and by Selected Woman and Household Characteristics, Feed the Future Phase One Baseline and Endline ZOI Surveys

Characteristic	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[b]	Sig.[c]
	Mean	95% CI	n[a]	Mean	95% CI	n[a]			
All women of reproductive age	4.4	4.3 – 4.4	2,125	4.9	4.8 – 5.0	2,151	0.6	0.000	***
Woman's age									
15-19	4.5	4.3 – 4.7	287	5.0	4.9 – 5.1	354	0.5	0.000	***
20-24	4.4	4.3 – 4.5	346	5.0	4.8 – 5.1	264	0.6	0.000	***
25-29	4.4	4.3 – 4.5	383	4.9	4.8 – 5.1	342	0.6	0.000	***
30-34	4.3	4.2 – 4.4	297	4.8	4.7 – 5.0	349	0.6	0.000	***
35-39	4.3	4.2 – 4.4	316	4.9	4.7 – 5.0	286	0.6	0.000	***
40-44	4.3	4.2 – 4.5	256	4.8	4.7 – 5.0	303	0.5	0.000	***
45-49	4.3	4.1 – 4.5	240	4.9	4.8 – 5.0	253	0.6	0.000	***
Woman's education									
No education	4.2	4.1 – 4.3	575	4.7	4.6 – 4.8	419	0.5	0.000	***
Less than primary	4.2	4.1 – 4.3	311	4.8	4.7 – 5.0	263	0.7	0.000	***
Completed primary	4.4	4.3 – 4.5	1,002	4.9	4.8 – 5.0	1,081	0.5	0.000	***
Completed secondary	4.8	4.6 – 5.0	141	5.2	5.0 – 5.5	224	0.5	0.002	**
Higher	4.7	4.5 – 5.0	96	5.2	5.0 – 5.4	164	0.5	0.006	**
Gendered household type									
Male and female adults	4.4	4.3 – 4.5	1,854	4.9	4.8 – 5.0	1,832	0.5	0.000	***
Female adults only	4.2	4.0 – 4.4	266	5.0	4.8 – 5.2	313	0.8	0.000	***
Male adults only	^	^	5	^	^	5	^	^	^
Children only	^	^	0	^	^	1	^	^	^
Poverty status									
Poor	4.0	3.9 – 4.2	799	4.6	4.5 – 4.7	493	0.5	0.000	***
Non-poor	4.6	4.5 – 4.7	1,326	5.0	5.0 – 5.1	1,658	0.5	0.000	***
Household hunger									
Little to no hunger	4.4	4.3 – 4.5	1,972	4.9	4.9 – 5.0	2,109	0.5	0.000	***
Moderate hunger	3.9	3.7 – 4.2	134	4.2	3.8 – 4.6	38	0.2	0.305	n/s
Severe hunger	^	^	19	^	^	4	^	^	^

CI=confidence interval; Diff.=difference; n=number; n/a= not applicable

^ Results not statistically reliable, n<30

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members (i.e., woman's age, gendered household type, woman's education, poverty status, and household hunger) are calculated using de jure household members.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table 6.2.2 presents the percentages of women of reproductive age in the Phase One ZOI who consumed each of the nine food groups, comparing estimates at 2011/2012 baseline and 2018/2019 endline.

Consumption of food from all nine food groups increased between baseline and endline, except for the grains, roots, and tubers group, which was 100 percent at both survey rounds. At the 2018/2019 endline, 45.8 percent of women of reproductive age in the Bangladesh ZOI consumed vitamin A-rich dark green leafy vegetables, and nearly 100 percent of surveyed women consumed other fruits and vegetables during the day and night preceding the survey. Consumption of legumes, beans, nuts, and seeds increased by 11.2 percentage points (37.1 percent) between 2011/2012 baseline and 2018/2019 endline, and the difference is statistically significant at the 0.1 percent level. Consumption of other vitamin-A rich vegetables increased by 12.7 percentage points between the two survey rounds, and the difference is statistically significant at the 0.1 percent level. Increases in the consumption of other fruits and vegetables, as well as flesh food and other miscellaneous small animal protein are statistically significant at the 1 percent and 5 percent levels, respectively.

Very small proportions of women of reproductive age in the Bangladesh ZOI consumed organ meat, dairy products, and eggs during the day and night preceding the baseline and endline surveys. The consumption of dairy products and organ meat barely increased between 2011/2012 baseline and 2018/2019 endline. Although the consumption of eggs increased by 9.0 percentage points between baseline and endline–statistically significant at the 0.1 percent level–79.1 percent of women still did not consume eggs during the 24 hours preceding the endline survey.

Table 6.2.2: Comparison of Percent of Women of Reproductive Age in the Phase One ZOI Who Consumed Specified Foods in the ZOI, Feed the Future Phase One Baseline and Endline ZOI Surveys

	Baseline (2011/2012)		Endline (2018/2019)			p-value[a]	Sig.[b]
Food group	**%**	**95% CI**	**%**	**95% CI**	**Diff.**		
Grains, roots, and tubers[†]	100.0	n/a	100.0	n/a	0.0	n/a	n/a
Legumes, beans, nuts, and seeds	30.2	26.5 – 34.0	41.4	38.1 – 44.8	11.2	0.000	***
Dairy products	9.1	7.4 – 10.8	11.3	9.2 – 13.4	2.2	0.105	n/s
Organ meat	0.5	0.0 – 0.9	0.9	0.3 – 1.5	0.4	0.250	n/s
Eggs	11.9	9.8 – 13.9	20.9	18.6 – 23.1	9.0	0.000	***
Flesh food and other miscellaneous small animal protein	78.2	75.3 – 81.1	82.5	79.8 – 85.2	4.4	0.032	*
Vitamin A-rich dark green leafy vegetables	30.6	26.5 – 34.8	45.8	41.6 – 49.9	15.1	0.000	***
Other vitamin A-rich vegetables and fruits	75.5	70.3 – 80.7	88.2	85.4 – 91.1	12.7	0.000	***
Other fruits and vegetables	99.0	98.4 – 99.6	99.9	99.8 – 100.0	0.9	0.004	**
Number of women of reproductive age	2,125		2,151				

CI=confidence interval; Diff.=difference; n/a=not applicable; n/s=not significant

[†] The 95% CIs are reported as 'n/a' because the baseline and endline estimates are 100.0; therefore, a 95% CI cannot be generated. Additionally, the p-value and significance level are not applicable.

[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

6.3 Infant and young child feeding

This section presents young children's dietary intake measures, including two Feed the Future indicators: (1) the prevalence of exclusive breastfeeding among children 0-5 months of age, and (2) the percent of children 6-23 months of age consuming a minimum acceptable diet (MAD).

6.3.1 Exclusive breastfeeding

Exclusive breastfeeding provides children with significant health and nutrition benefits, including protection from gastrointestinal infections and reduced risk of mortality due to infectious disease.[53] Exclusive breastfeeding means that the infant receives breast milk (including expressed breast milk or breast milk from a wet nurse) and may receive oral rehydration salts, vitamins, minerals, or medicines, but does not receive any other food or liquid. This indicator measures the percentage of children 0-5 months of age who were exclusively breastfed during the day preceding the survey.

Table 6.3.1 presents the prevalence of exclusive breastfeeding among children 0-5 months of age in the Phase One ZOI. This analysis required the use of BDHS 2011 data, which served as the baseline, and 2017/2018 data, which served as the endline. IFPRI analyzed BDHS 2011 and 2017/2018 data covering the 20 ZOI districts. Estimates are shown for all children, as well as by selected characteristics—child's sex and educational attainment of the child's primary caregiver. Note that the data are collected from each child's self-identified primary caregiver and not strictly from the biological mother, although it is often the same person.

Among all children 0-5 months of age in the Bangladesh ZOI, the prevalence of exclusive breastfeeding declined by 12.1 percentage points from 2011 baseline to 2017/2018 endline. This change is statistically significant at the 5 percent level. The decline in exclusive breastfeeding among children 0-5 months of age was observed irrespective of child's sex or the level of caregiver's education.

Analyzing exclusive breastfeeding by poverty status and household hunger is not possible because poverty status and household hunger data are not collected in the BDHS; therefore, these estimates are not presented.

[53] WHO (2018a)

Table 6.3.1: Comparison of Exclusive Breastfeeding among Children 0-5 Months of Age in the Phase One ZOI, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys

Characteristic	Baseline (2011)			Endline (2017/2018)			Diff.	p-value[b]	Sig.[c]
	%	95% CI	n[a]	%	95% CI	n[a]			
All children 0-5 months of age	64.8	56.1 – 73.4	194	52.7	44.9 – 60.5	236	-12.1	0.040	*
Child's sex									
Male	58.9	46.1 – 71.8	101	50.5	40.7 – 60.2	135	-8.5	0.296	n/s
Female	71.1	61.2 – 81.0	93	55.5	44.6 – 66.5	101	-15.6	0.044	*
Caregiver's education[d]									
No education	^	^	19	^	^	9	^	^	^
Less than primary*	^	^	25	41.6	25.4 – 57.9	35	n/a	n/a	n/a
Completed primary	65.7	56.3 – 75.2	115	52.7	41.2 – 64.3	131	-13.0	0.092	n/s
Completed secondary	^	^	9	^	^	15	^	^	^
Higher*	^	^	26	48.0	31.1 – 64.9	46	n/a	n/a	n/a
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30

n/a=not applicable

*As select estimates are not presented because the results are not statistically reliable, the difference, p-value, and significance could not be calculated; thus, these data are not applicable.

— = Data are not available as these data were not collected.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[d] The ZOI Survey identifies the primary caregiver of each age-eligible child. This person is likely, but not necessarily, the child's biological mother.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on de facto household members.

Sources: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

6.3.2 Minimum acceptable diet

Minimum acceptable diet (MAD) is one of the eight core indicators for assessing infant and young child feeding practices among children 6-23 months of age.[54] The MAD indicator captures multiple dimensions of feeding and is calculated separately for breastfed and non-breastfed children. This composite indicator

[54] This report template was prepared before the World Health Organization (WHO) updated the guidance for assessing infant and young child (IYCF) feeding practices. Please note that the 2021 updated guidelines have removed the distinction between core and optional indicators.

measures both the minimum meal frequency and minimum dietary diversity (MDD) based on caregiver reports of the frequency with which the child was fed and the foods that the child consumed during the day and night preceding the survey. Calculation of the indicator requires data on children's age in months, breastfeeding status, foods consumed, number of semi-solid or solid feeds, and number of milk feeds.

Children who meet both the MDD and the minimum meal frequency criteria during the day preceding the survey are considered to meet the MAD criteria. The definition of MDD has recently changed from consuming four out of seven food groups to at least five out of eight food groups.[55] Children 6-23 months of age who are currently breastfeeding must have consumed foods from at least five of eight food groups (MDD) and eaten solid, semi-solid, or soft foods at least two times if they were 6-8 months of age or at least three times if they were 9-23 months of age (minimum meal frequency). Children 6-23 months of age who are not currently breastfeeding must have consumed foods from at least four of six food groups[56] (MDD), received at least two milk feedings, and solid, semi-solid, or soft foods at least four times (minimum meal frequency). As recommended by WHO, the ZOI Survey disaggregates the indicator for the following age groups: 6-11 months, 12-17 months, and 18-23 months.[57]

Table 6.3.2 presents the MAD indicator for children 6-23 months of age in the Phase One ZOI, comparing estimates at 2011 baseline and at 2017/2018 endline using BDHS data. Estimates are shown for all children, as well as by selected characteristics—child's sex, age and caregiver's educational attainment.

The proportion of children 6-23 months of age that received a minimum acceptable diet improved over time, from about one-quarter (25.1 percent) at 2011 baseline to slightly over one-third (35.2 percent) at 2017/2018 endline. The difference is statistically significant at the 1 percent level. Disaggregated by child's sex, the results show that girls consistently outpaced boys in receiving a minimum acceptable diet at 2011 baseline and 2017/2018 endline. The proportion of children achieving a minimum acceptable diet increases with child's age at 2011 baseline and 2017/2018 endline, and increases for all age groups over the same reference period.

BDHS estimates for children 6-23 months of age who achieved MAD cannot be disaggregated by poverty status or household hunger because these indicators are not collected in the BDHS.

[55] The eight food groups for breastfed children are as follows: (1) breastmilk; (2) grains, roots, and tubers; (3) legumes and nuts; (4) dairy products (milk, yogurt, cheese); (5) flesh foods (meat, fish, poultry, and liver or organ meats); (6) eggs; (7) vitamin-A rich fruits and vegetables; and (8) other fruits and vegetables.
[56] The six food groups for non-breastfed children are the same as for breastfed children, except that they exclude dairy products (milk, yogurt, cheese).
[57] WHO (2018b)

Table 6.3.2: Comparison of Children 6-23 Months of Age in the Phase One ZOI Who Received a Minimum Acceptable Diet, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys

Characteristic	Baseline (2011)			Endline (2017/2018)			Diff.	p-value[b]	Sig.[c]
	%	95% CI	n[a]	%	95% CI	n[a]			
All children 6-23 months of age	25.1	20.9 – 29.3	533	35.2	31.2 – 39.1	537	10.0	0.001	**
Child's sex									
Male	22.2	16.3 – 28.1	264	33.9	27.9 – 39.9	265	11.7	0.010	*
Female	27.9	21.7 – 34.1	269	36.3	29.4 – 43.2	272	8.5	0.069	n/s
Child's age									
6-11 months	13.4	8.5 – 18.3	191	18.9	12.3 – 25.4	183	5.5	0.175	n/s
12-17 months	27.7	20.2 – 35.2	187	41.2	32.1 – 50.3	181	13.5	0.025	*
18-23 months	36.5	27.6 – 45.3	155	45.7	36.6 – 54.9	173	9.2	0.145	n/s
Child's breastfeeding status									
Breastfeeding	25.4	21.1 – 29.7	506	36.1	32.0 – 40.2	517	10.7	0.001	**
Not breastfeeding	^	^	27	^	^	20	^	^	^
Caregiver's education[d]									
No education	12.6	3.5 – 21.7	39	^	^	17	^	^	^
Less than primary	18.7	6.3 – 31.0	92	33.5	22.4 – 44.6	81	14.8	0.080	n/s
Completed primary	26.4	21.2 – 31.6	317	32.7	27.4 – 37.9	296	6.2	0.105	n/s
Completed secondary	25.6	11.2 – 40.1	41	45.8	26.0 – 65.6	32	20.2	0.123	n/s
Higher	48.4	31.5 – 65.3	44	44.9	33.5 – 56.3	111	-3.5	0.745	n/s
Gendered household type									
Male and female adults	25.5	20.8 – 30.1	499	34.0	29.7 – 38.4	490	8.6	0.010	*
Female adults only*	^	^	20	48.2	32.7 – 63.7	44	n/a	n/a	n/a
Male adults only	^	^	14	^	^	3	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

*As select estimates are not presented because the results are not statistically reliable, the difference, p-value, and significance could not be calculated; thus, these data are not applicable.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[d] The ZOI Survey identifies the primary caregiver of each age-eligible child. This person is likely, but not necessarily, the child's biological mother.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on de facto household members.

Sources: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table 6.3.3 presents the percentages of children in the Phase One ZOI that achieved minimum meal frequency and MDD, as well as the percentages of children that consumed each of the food groups included in the MAD indicator, comparing estimates at baseline and at endline.[58] Estimates are shown for all children and by age categories, and are presented for all children and separately for breastfed children and non-breastfed children.

Both minimum meal frequency and minimum dietary diversity have improved between 2011 baseline and 2017/2018 endline for children 6-23 months of age overall, and for all age groups. Minimum meal frequency increased from 73.6 percent to 82.8 percent, whereas the proportion of minimum dietary diversity for children 6-23 months of age improved from slightly over one-quarter (28.2 percent) to over one-third (36.8 percent).

Although breastmilk consumption slightly improved between the two survey rounds, consumption was already nearly universal among children 6-23 months of age at baseline (2011: 95.7 percent; 2017/2018: 97.0 percent).

Between 2011 baseline and 2017/2018 endline, children 6-23 months of age consumed more grains, roots and tubers, and flesh foods (for example, fish, meat); however, the consumption of legumes and nuts, dairy products, and vitamin A-rich fruits and vegetables decreased overall and for all three age groups. Egg consumption increased from 28.0 percent to 47.3 percent between 2011 and 2017/2018.

Table 6.3.3: Comparison of Percent of Children 6-23 Months of Age in the Phase One ZOI Achieving Minimum Feeding Frequency, Dietary Diversity, and Consuming Specified Foods, in Total and by Breastfeeding Status and Age, Bangladesh Demographic and Health Surveys

Breastfeeding status and food group consumed	Baseline (2011)				Endline (2017/2018)			
	All Children	Child age (months)			All children	Child age (months)		
		6-11	12-17	18-23		6-11	12-17	18-23
All children 6-23 months of age								
Achieving minimum meal frequency	73.6	64.8	77.5	79.6	82.8	76	85.4	87.2
Achieving minimum dietary diversity	28.2	15.3	30.7	40.8	36.8	20.4	42.0	48.3
Consuming:								
Breastmilk	95.7	97.9	95.3	93.5	97.0	99.4	95.9	95.7
Grains, roots, and tubers	82.3	69.8	85.9	93.4	90.7	79.9	95.1	97.4
Legumes and nuts	10.9	6.5	11.0	16.1	17.9	10.5	26.3	17.1
Dairy products	27.1	25.2	26.4	30.1	30.6	33.6	28.4	29.9
Flesh foods	50.8	31.2	57.2	67.2	55.1	34.1	60.4	70.9
Eggs	28.0	21.6	33.5	29.4	47.3	35.6	53.4	53.2
Vitamin A-rich fruits and vegetables	37.7	21.7	43.7	49.9	37.5	19.2	44.1	49.5

[58] Differences between baseline and endline estimates and confidence intervals and p-values for the differences for minimum meal frequency, MDD, and the percentage of children consuming each food group, in total and by breastfeeding status, are tabulated in Appendix 1, Table A6.2.

Breastfeeding status and food group consumed	Baseline (2011)				Endline (2017/2018)			
	All Children	Child age (months)			All children	Child age (months)		
		6-11	12-17	18-23		6-11	12-17	18-23
Other fruits and vegetables	18.9	12.0	19.6	26.5	26.0	17.2	30.0	30.9
Number of children	533	191	187	155	537	183	181	173
Breastfed children								
Achieving minimum meal frequency	73.6	65.4	77.4	79.6	83.8	76.2	86.5	88.9
Achieving minimum dietary diversity	28.0	15.2	31.3	40.3	37.5	20.5	42.9	49.9
Consuming:								
Breastmilk	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Grains, roots, and tubers	81.6	69.3	85.2	92.9	90.4	79.8	94.9	97.2
Legumes and nuts	10.4	6.7	10.6	14.9	17.8	10.6	26.0	17.1
Dairy products	25.0	23.6	24.1	28.0	29.6	33.2	27.4	28.0
Flesh foods	50.7	31.1	56.3	69.0	54.4	33.7	60.4	70.4
Eggs	27.3	21.2	34.2	26.8	47.4	35.6	54.0	53.3
Vitamin A-rich fruits and vegetables	37.5	21.3	44.9	49.0	37.9	19.3	43.8	51.5
Other fruits and vegetables	18.8	11.9	19.3	27.0	25.7	16.9	30.1	30.5
Number of breastfed children	506	186	175	145	517	181	172	164
Non-breastfed children								
Achieving minimum meal frequency	^	^	^	^	^	^	^	^
Achieving minimum milk feeding frequency	^	^	^	^	^	^	^	^
Achieving minimum dietary diversity	^	^	^	^	^	^	^	^
Consuming:								
Grains, roots, and tubers	^	^	^	^	^	^	^	^
Legumes and nuts	^	^	^	^	^	^	^	^
Dairy products	^	^	^	^	^	^	^	^
Flesh foods	^	^	^	^	^	^	^	^
Eggs	^	^	^	^	^	^	^	^
Vitamin A-rich fruits and vegetables	^	^	^	^	^	^	^	^
Other fruits and vegetables	^	^	^	^	^	^	^	^
Number of non-breastfed children	27	5	12	10	20	2	9	9

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on de facto household members.

Significance tests were performed to determine whether a difference exists between the baseline and endline estimates. Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

Sources: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

7. NUTRITIONAL STATUS OF WOMEN AND CHILDREN

This chapter presents findings on the nutritional status of women and children, including the Feed the Future Phase One anthropometry indicators: the percentage of women of reproductive age who are underweight, and the percentages of children under 5 years of age who are stunted, wasted, and underweight. These indicators were computed using data from the Bangladesh Demographic and Health Survey (BDHS) 2011 (baseline) and 2017/2018 (endline) covering the 20 ZOI districts.

7.1 Women's nutritional status

Body mass index (BMI) is a calculation used to understand nutritional status, particularly of adults. BMI is the weight of the individual in kilograms divided by their height in meters squared (weight[kg]/ height[m]^2). BMI is an inexpensive and easy-to-perform method of screening for weight category: underweight, normal or healthy weight, overweight, and obese. BMI is interpreted directly using categories with specific cut-off points, which is useful when assessing the nutritional status of adults. A high BMI can be an indicator of high body fat, but BMI is not diagnostic of the body fat or health of an individual. To determine whether a high BMI is a health risk, a healthcare provider would need to perform further assessments.

Table 7.1 presents anthropometry results for women of reproductive age in the Phase One ZOI, comparing estimates at 2011 baseline and 2017/2018 endline.[59] It presents women's mean BMI and the percentage of women by BMI category: underweight (BMI<18.5), normal weight (18.5≤BMI<25.0), overweight (25.0≤BMI<30.0), and obese (BMI≥30.0). Estimates are shown for all non-pregnant women of reproductive age, as well as by selected characteristics—women's age and educational attainment, and gendered household type.

[59] Differences between baseline and endline estimates and confidence intervals and p-values for the differences for mean BMI and each BMI category are tabulated in Appendix 1, Tables A7.1.1 through A7.1.5.

Between 2011 baseline and 2017/2018 endline, among women of reproductive age (15-49 years), average BMI improved while the prevalence of underweight and normal weight reduced. Alarmingly, the proportion of overweight women increased by 92.6 percent (from 13.6 percent to 26.2 percent), and the proportion of obese women nearly tripled, from 2.3 percent in 2011 to 6.4 percent in 2017/2018.

The prevalence of underweight was highest among women in the youngest age groups at both survey rounds. Encouragingly, underweight decreased for all age groups between 2011 baseline and 2017/2018 endline. Similarly, underweight was highest among less educated women, yet decreased for all education levels between the two time periods. On the other hand, overweight and obesity increased as women's age and education increased at both 2011 baseline and 2017/2018 endline.

Women's nutrition does not differ by gendered household type except for overweight at 2011 baseline. BDHS estimates for women's nutritional status cannot be disaggregated by poverty status or household hunger because these data were not collected in the BDHS.

Table 7.1: Comparison of Mean BMI and Prevalence of Underweight, Normal Weight, Overweight, and Obese Women of Reproductive Age in the Phase One ZOI, in Total and by Individual and Household Characteristics, Bangladesh Demographic and Health Surveys

	Baseline (2011)						Endline (2017/2018)					
		BMI category (%)						BMI category (%)				
Characteristic	Mean BMI	Under-weight	Normal weight	Over-weight	Obese	n[a]	Mean BMI	Under-weight	Normal weight	Over-weight	Obese	n[a]
All non-pregnant women of reproductive age	21.4	22.2	61.8	13.6	2.3	4,327	23.4	11.0	56.4	26.2	6.4	4,627
Woman's age												
15-19	19.7	34.6	62.5	2.8	0.2	446	21.1	21.9	66.4	10.7	1.1	427
20-24	20.7	26.3	62.9	9.2	1.6	766	22.4	15.7	61.4	19.3	3.6	716
25-29	21.8	18.5	63.8	15.4	2.3	770	23.6	9.6	56.9	26.7	6.7	727
30-34	22.0	18.9	60.4	17.6	3.2	658	24	6.9	54.4	30.9	7.7	793
35-39	21.8	16.9	64.9	14.7	3.4	622	24	7.2	54.1	32.0	6.7	738
40-44	22	21.0	58.3	18.0	2.6	577	23.9	10.4	50.6	31.3	7.7	621
45-49	21.8	22.4	58.6	16.1	2.9	488	24	9.2	53.9	26.7	10.1	605
Woman's education												
No education	21.3	23.3	62.2	13.4	1.1	847	23.0	12.3	58.1	24.4	5.2	533
Less than primary	21.0	25.5	62.5	10.3	1.7	867	23.2	11.7	56.8	25.4	6.1	1,010
Completed primary	21.4	22.7	61.4	13.3	2.5	2,024	23.4	11.0	56.8	26.0	6.3	2,179
Completed secondary	22.8	12.5	61.9	20.7	4.9	216	24.1	5.7	58.8	27.2	8.3	217
Higher	23.0	10.8	61.4	22.5	5.4	373	24.0	9.8	51.9	29.7	8.5	688
Gendered household type												
Male and female adults	21.4	22.1	62.1	13.4	2.4	4,060	23.4	11.0	56.3	26.1	6.5	4,204
Female adults only	21.6	21.9	57.6	18.4	2.1	243	23.3	10.2	57.2	27.1	5.5	414
Male adults only	^	^	^	^	^	24	^	^	^	^	^	9
Children only (no adults)	^	^	^	^	^	0	^	^	^	^	^	0
Poverty status												
Poor	—	—	—	—	—	—	—	—	—	—	—	—

Characteristic	Baseline (2011)						Endline (2017/2018)					
		BMI category (%)						BMI category (%)				
	Mean BMI	Under-weight	Normal weight	Over-weight	Obese	n[a]	Mean BMI	Under-weight	Normal weight	Over-weight	Obese	n[a]
Non-poor	—	—	—	—	—	—	—	—	—	—	—	—
Household hunger												
Little to no hunger	—	—	—	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on de facto household members.

Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

7.2 Stunting, wasting, and underweight among children under 5 years of age

This section presents three indicators that rely on anthropometric measurements of children under 5 years of age in the Phase One ZOI: stunting (low height-for-age), wasting (low weight-for-height), and underweight (low weight-for-age). These analyses use data from BDHS 2011 and 2017/2018, which serve as the baseline and endline.

7.2.1 Stunting (low height-for-age)

Stunting, or linear growth retardation, is a consequence of an inadequate growth environment. Reducing the prevalence of stunting among children, particularly children 0-23 months of age, is important because linear growth retardation is causally linked to difficult birth and poor birth outcomes, and is associated with—but may not cause—delayed child development, reduced earnings in adulthood, and chronic diseases.[60] Stunting is a height-for-age measurement that reflects chronic undernutrition. This indicator measures the percentage of children 0-59 months of age who are stunted, as defined by a height-for-age z-score more than two standard deviations (SDs) below the median of the 2006 WHO Child Growth Standard.[61]

Table 7.2.1 presents the prevalence of severe stunting (<-3 SD) and stunting (<-2 SD) and mean height-for-weight z-scores for children under 5 years of age in the Phase One ZOI, comparing estimates at 2011 baseline and 2017/2018 endline.[62] Estimates are presented for all children and by selected characteristics—child's sex and age, caregiver's educational attainment, and gendered household type.

[60] Leroy & Frongillo (2019)

[61] WHO & UNICEF (2006)

[62] Differences between baseline and endline estimates and confidence intervals and p-values for the differences for severe stunting, stunting, and mean z-score are tabulated in Appendix 1, Tables A7.2.1 through A7.2.3.

During the reference period, stunting decreased from 38.6 percent to 27.0 percent, and severe stunting declined from 14.8 percent to 6.9 percent. Reductions were consistently observed across all age groups. The decline was also consistent across child's sex: at 2011 baseline, 37.6 percent of boys were stunted compared with 39.7 percent of girls. By 2017/2018 endline, this reduced to 25.6 percent of boys and 28.6 percent of girls. Also, mean z-scores increased from 2011 to 2017/2018 for all age groups except children 0-11 months of age, and increased among children with caregivers of higher educational attainment. Additionally, stunting and severe stunting were lower for more educated caregivers at 2011 baseline and 2017/2018 endline.

At 2011 baseline, the proportions of severely stunted and stunted children were higher in dual adult households compared with female adult only households. However, the proportions of stunting and severe stunting were similar in dual adult households and female adult only households at 2017/2018 endline.

BDHS estimates for stunting cannot be disaggregated by poverty status or household hunger because these data are not collected in the BDHS.

Table 7.2.1: Comparison of the Prevalence of Stunting and Mean Height-for-Age Z-Scores among Children Under 5 Years of Age in the Phase One ZOI, in Total and by Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys

Characteristic	Baseline (2011)				Endline (2017/2018)			
	Severely stunted (<-3 SD) (%)	Stunted (<-2 SD) (%)	Mean z-score	n[a]	Severely stunted (<-3 SD) (%)	Stunted (<-2 SD) (%)	Mean z-score	n[a]
All children under 5 years of age	14.8	38.6	-1.6	1,797	6.9	27	-1.3	1,769
Child's sex								
Male	14.3	37.6	-1.6	907	6	25.6	-1.2	913
Female	15.4	39.7	-1.7	890	7.9	28.6	-1.4	856
Child's age								
0-11 months	6	22.2	-0.9	352	6.1	19.6	-1	412
12-23 months	21.4	49.9	-2	338	10.7	33	-1.4	357
24-35 months	15.1	37.5	-1.8	340	7.2	32.2	-1.5	331
36-47 months	17.9	48	-1.9	408	5.9	24.7	-1.3	306
48-59 months	13.7	34.5	-1.7	359	4.6	26.6	-1.4	363
Caregiver's education[b]								
No education	17.6	43.5	-1.9	183	13.8	47.3	-1.7	70
Less than primary	18.4	39.2	-1.8	319	9.3	32.8	-1.6	267
Completed primary	15.2	40.1	-1.7	1,023	7.3	28.9	-1.4	990
Completed secondary	6.4	27.4	-1.1	109	5	25.4	-1.2	99
Higher	3.9	24.4	-1.1	163	2.4	10.8	-0.7	343
Gendered household type								
Male and female adults	14.8	38.7	-1.6	1,693	7	26.9	-1.3	1,603
Female adults only	12.6	31.3	-1.6	85	5.2	28.6	-1.3	158
Male adults only	^	^	^	19	^	^	^	8
Children only	^	^	^	0	^	^	^	0
Poverty status								
Poor	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—
Household hunger								
Little to no hunger	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] The ZOI Survey identifies the primary caregiver of each age-eligible child. This person is likely, but not necessarily, the child's biological mother.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on de facto household members.

Sources: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

7.2.2 Wasting (low weight-for-height)

Wasting is an indicator of acute malnutrition. Children who are wasted are too thin for their height and have a much greater risk of dying than children who are not wasted. The wasting ZOI indicator measures the percentage of children 0-59 months of age in the Phase One ZOI who are acutely malnourished, as defined by a weight-for-height z-score[63] more than 2 SDs below the median of the 2006 WHO Child Growth Standards.

Table 7.2.2 presents the prevalence of severe wasting (<-3 SD), wasting (<-2 SD), and mean weight-for-height z-scores for children under 5 years of age in the Phase One ZOI, comparing estimates at baseline and at endline.[64] **Table 7.2.3** presents the prevalence of healthy weight (≥-2 SD and ≤+2 SD), overweight (>+2 SD), and obese (>+3 SD), children under 5 years of age in the Phase One ZOI, comparing estimates at baseline and at endline.[65] Estimates are presented for all children and by selected characteristics—child's sex and age, caregiver's educational attainment, and gendered household type.

[63] A weight-for-length z-score is calculated for children 0-23 months of age and any other children who are measured lying down. A weight-for-height z-score is calculated for children 24-59 months of age who are measured standing up.

[64] Differences between baseline and endline estimates and confidence intervals and p-values for the differences for severe wasting, wasting, and mean z-score are tabulated in Appendix 1, Tables A7.3.1, A7.3.2, and A7.3.6.

[65] Differences between baseline and endline estimates and confidence intervals and p-values for the differences for healthy weight, overweight, and obese children are tabulated in Appendix 1, Tables A7.3.3 through A7.3.5.

Between 2011 baseline and 2017/2018 endline, severe wasting and wasting decreased (severe wasting: 3.0 percent to 1.5 percent; wasting: 14.2 percent to 7.4 percent). These reductions were observed among boys and girls.[66] Unlike stunting, there were no noticeable patterns between the prevalence of wasting and severe wasting by child's age. However, the prevalence of wasting was higher among less educated caregivers than more educated caregivers at 2011 baseline and 2017/2018 endline. Wasting was higher among dual adult households, and severe wasting was higher among female adult households at both 2011 baseline and 2017/2018 endline.

BDHS estimates for wasting cannot be disaggregated by poverty status or household hunger because these data were not collected in the BDHS.

[66] As mentioned in Chapter 2, if the rainy season contributed to wasting in children under 5 years of age in the BDHS baseline sample, then the reported reductions in wasting from baseline to endline are likely overestimated.

Table 7.2.2: Comparison of Prevalence of Wasting and Mean Weight-for-Height Z-scores among Children Under 5 Years of Age in the Phase One ZOI, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys

	Baseline (2011)				Endline (2017/2018)			
Characteristic	Severely wasted (<-3 SD) (%)	Wasted (<-2 SD) (%)	Mean z-score	n[a]	Severely wasted (<-3 SD) (%)	Wasted (<-2 SD) (%)	Mean z-score	n[a]
All children under 5 years of age	3.0	14.2	-0.9	1,797	1.5	7.4	-0.4	1,763
Child's sex								
Male	3.0	14.7	-0.8	907	2.0	7.8	-0.4	908
Female	3.1	13.7	-0.9	890	0.9	7.0	-0.4	855
Child's age								
0-11 months	3.4	13.2	-0.5	352	1.2	7.1	-0.2	407
12-23 months	2.5	11.5	-0.6	338	1.8	7.5	-0.4	357
24-35 months	3.9	14.0	-1.0	340	1.6	5.6	-0.4	331
36-47 months	3.7	17.0	-1.1	408	1.9	8.0	-0.6	306
48-59 months	1.7	14.4	-1	359	0.9	8.8	-0.7	362
Caregiver's education[b]								
No education	5.2	16.6	-1.0	183	2.1	16.0	-0.9	67
Less than primary	2.6	18.2	-1.1	319	1.9	8.5	-0.5	268
Completed primary	2.4	13.2	-0.8	1,023	1.6	7.7	-0.5	987
Completed secondary	3.7	10.6	-0.7	109	2.6	4.1	-0.2	99
Higher	6.2	10.9	-0.6	163	0.1	4.3	-0.1	342
Gendered household type								
Male and female adults	2.9	14.4	-0.9	1693	1.4	7.7	-0.4	1,597
Female adults only	5.5	8.0	-0.7	85	2.2	4.9	-0.4	158
Male adults only	^	^	^	19	^	^	^	8
Children only	^	^	^	0	^	^	^	0
Poverty status								
Poor	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—

Household hunger								
Little to no hunger	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] The ZOI Survey identifies the primary caregiver of each age-eligible child. This person is likely, but not necessarily, the child's biological mother.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on de facto household members.

Sources: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018

7.2.3 Healthy Weight, Overweight, and Obesity

Between 2011 baseline and 2017/2018 endline, the prevalence of healthy weight among children under-five (84.8 percent to 90.1 percent), overweight (1.0 percent to 2.5 percent) and obesity (0.4 percent to 0.7 percent) increased. Healthy weight among boys and girls improved (boys: 83.7 percent to 89.1 percent; girls: 85.8 percent to 91.2 percent).

Encouragingly, the prevalence of healthy weight increased for children under-five, irrespective of child's sex, age category, caregiver education, or gendered household type. Across both survey rounds, female adult only households had a higher proportion of healthy weight children (91.1 percent to 94.2 percent) compared with dual adult households (84.5 percent in 2011 to 89.6 percent in 2017/2018). Nevertheless, the increase in the proportion of healthy weight children among dual adult households was statistically significant at the 0.1 percent level (**Table A1.7.3.3**), whereas the change in dual adult households was not found to be statistically significant.

Despite these positive findings, there is a concerning rise in overweight and obesity among young children in the Feed the Future ZOI. The prevalence of overweight more than doubled among boys (1.6 percent to 3.1 percent) and girls (0.5 percent to 1.8 percent). The increase in overweight among girls was significant at the 10 percent level. There was a higher proportion of overweight children in dual adult households than female only households at 2011 baseline and 2017/2018 endline.

Likewise, the rate of increase in the prevalence of obesity between 2011 baseline and 2017/2018 endline was nearly seven-times higher among young girls than boys. Overall, the prevalence of obesity increased, irrespective of child's sex, age category, or gendered household type.

Table 7.2.3: Comparison of Prevalence of Healthy Weight, Overweight, and Obesity among Children Under 5 Years of Age in the ZOI, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys

	Baseline (2011)				Endline (2017/2018)			
Characteristic	Healthy weight (-2 SD to +2 SD) (%)	Overweight (> +2SD) (%)	Obese (> +3SD) (%)	n[a]	Healthy weight (-2 SD to +2 SD) (%)	Overweight (> +2SD) (%)	Obese (> +3SD) (%)	n[a]
All children under 5 years of age	84.8	1.0	0.4	1,797	90.1	2.5	0.7	1,763
Child's sex								
Male	83.7	1.6	0.7	907	89.1	3.1	0.6	908
Female	85.8	0.5	0.1	890	91.2	1.8	0.7	855
Child's age								
0-11 months	83.9	2.9	1.2	352	89.4	3.5	1.6	407
12-23 months	87.6	0.8	0.5	338	89.7	2.8	0.5	357
24-35 months	85.8	0.2	0.1	340	91	3.4	0.9	331
36-47 months	82.2	0.8	0.2	408	91.5	0.5	0.0	306
48-59 months	85	0.6	0.2	359	89.4	1.7	0.0	362
Caregiver's education[b]								
No education	83.4	0.0	0.0	183	84	0.0	0.0	67
Less than primary	81.6	0.2	0.0	319	89.6	1.9	0.3	268
Completed primary	85.6	1.2	0.5	1,023	90.6	1.7	0.7	987
Completed secondary	87.5	1.9	0.0	109	92.4	3.5	0.6	99
Higher	86.1	3.0	1.8	163	89.7	6.0	1.1	342
Gendered household type								
Male and female adults	84.5	1.1	0.5	1,693	89.6	2.6	0.7	1,597
Female adults only	91.1	0.9	0.0	85	94.2	0.9	0.0	158
Male adults only	^	^	^	19	^	^	^	8
Children only	^	^	^	0	^	^	^	0
Poverty status								
Poor	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—

Characteristic	Baseline (2011)				Endline (2017/2018)			
	Healthy weight (-2 SD to +2 SD) (%)	Overweight (> +2SD) (%)	Obese (> +3SD) (%)	n[a]	Healthy weight (-2 SD to +2 SD) (%)	Overweight (> +2SD) (%)	Obese (> +3SD) (%)	n[a]
Household hunger								
Little to no hunger	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] The ZOI Survey identifies the primary caregiver of each age-eligible child. This person is likely, but not necessarily, the child's biological mother.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on de facto household members.

Significance tests were performed to determine whether a difference exists between the baseline and endline estimates. Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

7.2.3 Underweight (low weight-for-age)

Underweight is a weight-for-age measurement that reflects acute undernutrition, chronic undernutrition, or both. This indicator measures the percentage of children 0-59 months of age who are underweight, as defined by a weight-for-age z-score of more than two SDs below the median of the 2006 WHO Child Growth Standards.

Table 7.2.4 shows the prevalence of severe underweight (<-3 SD), underweight (<-2 SD), and mean weight-for-age z-scores for children under 5 years of age in the Phase One ZOI.[67] Estimates are presented for all children and by selected characteristics—child's sex and age, caregiver's educational attainment, and gendered household type.

Encouragingly, severe underweight decreased by about 60.7 percent (8.4 percent to 3.3 percent), and underweight dropped by about 45.8 percent (32.3 percent to 17.5 percent). Both reductions were significant at the 0.1 percent levels (**Tables A1.7.4.1 and A.1.7.4.2**). The prevalence of severely underweight and underweight declined considerably for boys and girls between the 2011 baseline and 2017/2018 endline. The prevalence of severe underweight and underweight is lower for more educated caregivers at 2011 baseline and 2017/2018 endline, and the prevalence of underweight and severe underweight decreased for all caregiver's education categories.

Moreover, between 2011 baseline and 2017/2018 endline, mean z-scores increased for all children, irrespective of caregiver's educational attainment. While the prevalence of severe underweight and underweight decreased for all age groups between 2011 baseline to 2017/2018 endline, severe underweight and underweight still increased as children's age increases at 2011 baseline and 2017/2018 endline.

BDHS estimates for underweight among children under-five cannot be disaggregated by poverty status or household hunger because these data were not collected in the BDHS.

[67] Differences between baseline and endline estimates and confidence intervals and p-values for the differences for severe underweight, underweight, and mean z-score are tabulated in Appendix 1, Tables A7.4.1 through A7.4.3.

Table 7.2.4: Comparison of Prevalence of Underweight and Mean Weight-for-Age Z-scores among Children Under 5 Years of Age in the Phase One ZOI, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys

	Baseline (2011)				Endline (2017/2018)			
Characteristic	Severely underweight (<-3 SD) (%)	Underweight (<-2 SD) (%)	Mean z-score	n[a]	Severely underweight (<-3 SD) (%)	Underweight (<-2 SD) (%)	Mean z-score	n[a]
All children under 5 years of age	8.4	32.3	-1.5	1,797	3.3	17.5	-1.1	1,797
Child's sex								
Male	8.2	30.3	-1.5	907	2.7	16.0	-1.0	930
Female	8.5	34.3	-1.6	890	3.9	19.0	-1.1	867
Child's age								
0-11 months	4.1	18.1	-1	352	3.9	14.0	-0.9	415
12-23 months	8.4	29.6	-1.4	338	3.5	16.2	-1.0	363
24-35 months	8.3	32.9	-1.7	340	2.5	18.5	-1.0	336
36-47 months	10.6	40.9	-1.8	408	2.4	16.2	-1.2	316
48-59 months	9.8	37.8	-1.7	359	3.9	22.8	-1.3	367
Caregiver's education[b]								
No education	12.2	41.3	-1.8	183	10.7	32.4	-1.6	70
Less than primary	11.2	39.1	-1.7	319	4.0	21.2	-1.3	271
Completed primary	7.8	31.2	-1.5	1,023	3.1	18.5	-1.1	1,007
Completed secondary	3.3	14.9	-1.1	109	1.3	13.0	-0.8	100
Higher	3.4	21.9	-1.1	163	1.9	8.3	-0.5	349
Gendered household type								
Male and female adults	8.4	32.1	-1.5	1,693	3.4	17.5	-1.1	1,629
Female adults only	4.6	29.3	-1.4	85	2.3	17.1	-1.0	160
Male adults only	^	^	^	19	^	^	^	8
Children only	^	^	^	0	^	^	^	0
Poverty status								
Poor	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—

Household hunger								
Little to no hunger	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] The ZOI Survey identifies the primary caregiver of each age-eligible child. This person is likely, but not necessarily, the child's biological mother.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on de facto household members.

Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

8. AGRICULTURE IN THE BANGLADESH ZOI

This chapter reviews changes in select indicators of agriculture between 2011/2012 baseline and 2018/2019 endline in the Bangladesh ZOI, including trends in land distribution and land tenure arrangements, cropping patterns, and crop productivity.

8.1 Land ownership and land tenure patterns

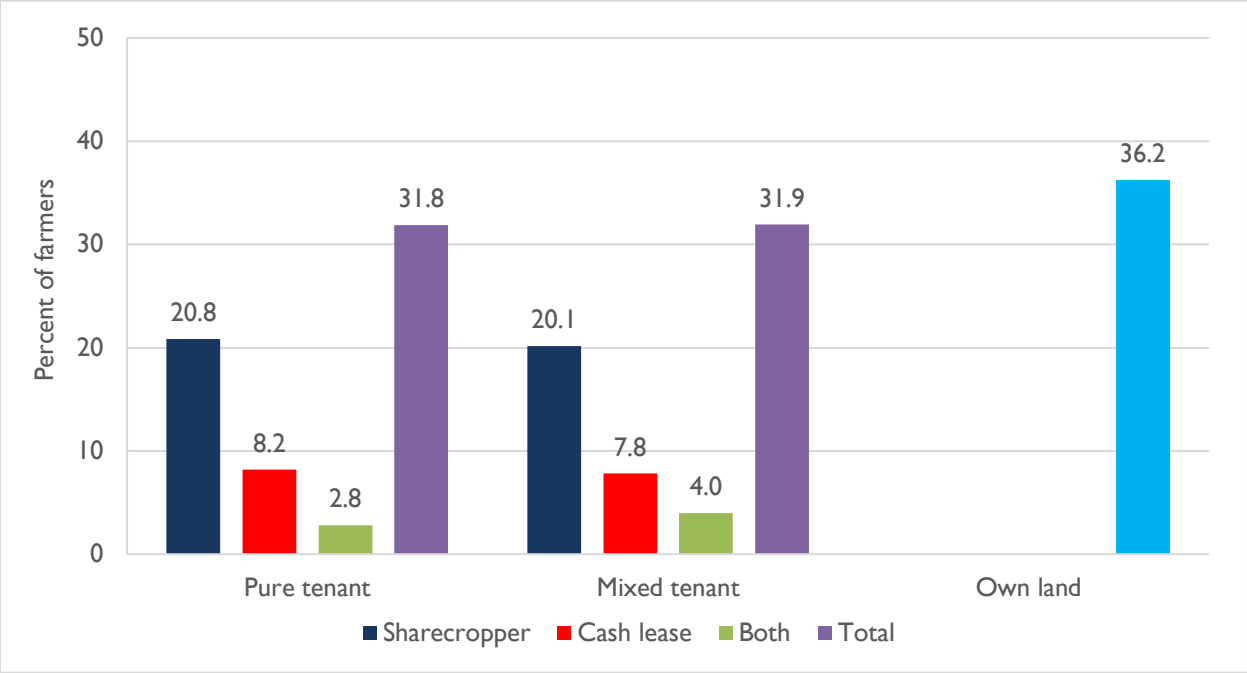
Land is the most important factor of agricultural production. However, about half (48.8 percent) of households in the Bangladesh Feed the Future ZOI are landless at the 2018/2019 endline—they do not own any cultivable land. This remains virtually unchanged from 2011/2012 baseline (48.4 percent).

Figures 8.1 and 8.2 show the land tenancy arrangements in the ZOI between 2011/2012 baseline and 2018/2019 endline. At 2011/2012 baseline, about one-third (32 percent) of all farm households in the ZOI were pure tenants—that is, they did not own the land they cultivated. The share of pure tenant farmers increased to 35 percent at the endline. About 36 percent and 37 percent of farmers cultivated only their own land at baseline and endline, respectively. The proportion of mixed-tenant farmers—those who cultivate their own land and also take land in as sharecroppers and/or leaseholders—decreased from 32 percent at baseline to 27 percent at endline.

The dominant land-tenure arrangement in the ZOI is sharecropping, where the crop produced is shared between the cultivator and the landowner in different proportions that have been agreed upon prior to cultivation. At 2011/2012 baseline, about 41 percent of the farmers were sharecroppers, who were either pure tenants (20.8 percent) or mixed-tenants (20.1 percent); and 16 percent of the farmers had cash-lease arrangements either as pure tenants (8.2 percent) or mixed-tenants (7.8 percent). At the 2018/2019 endline, about 37 percent of the farmers were sharecroppers (20.7 percent pure tenants and 15.8 percent mixed tenants), and about 20 percent of the farmers had cash-lease arrangements (11.2 percent pure tenants and 8.6 percent mixed tenants). The proportion of farmers operating both sharecropped and cash-leased land (either as tenants or landowners) remained relatively consistent (about 7 percent at baseline and 6 percent at endline). Compared with sharecropping, cash-leasing of land for cultivation tends to be more popular among the ZOI farmers from baseline to endline.

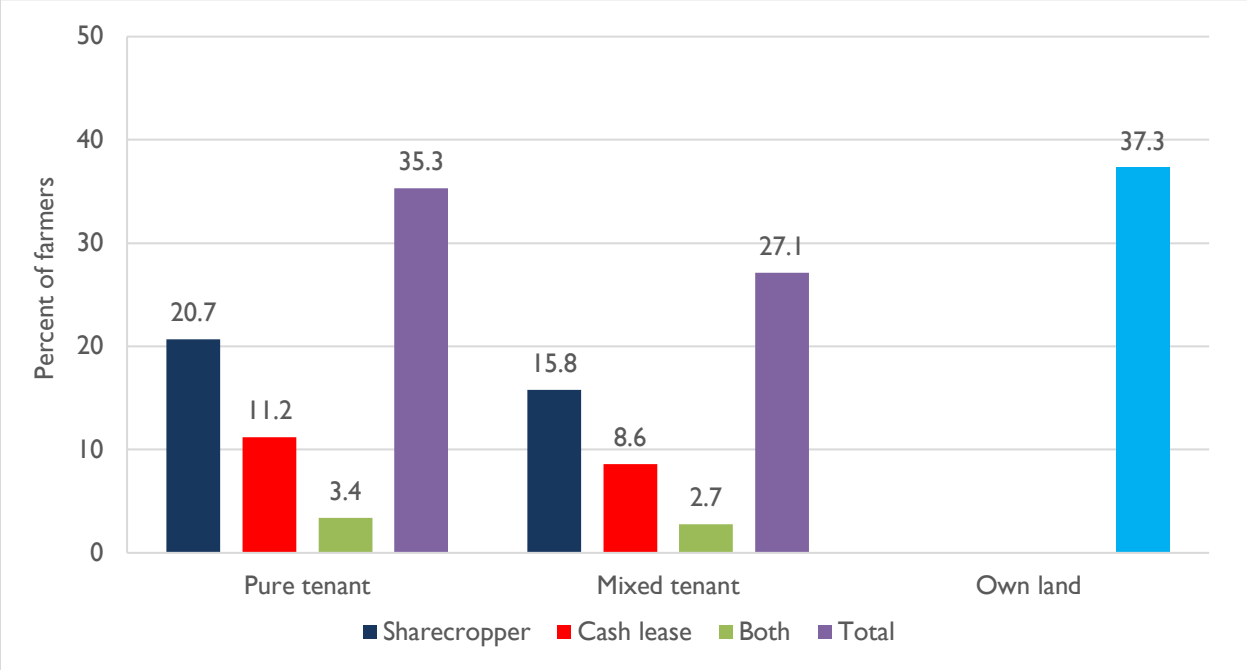
The changes in the percentage of cash lease pure tenant and sharecropper mix tenant are significant at the 5 percent level. Likewise, the differences in the percentage of total pure tenant farmers and total mix tenant farmers are significant at the 5 percent level from 2011/2012 baseline to 2018/2019 endline.

Figure 8.1: Land tenancy status of farmers in Feed the Future Phase One Baseline Survey



Source: Feed the Future Bangladesh ZOI Survey, 2011/2012.

Figure 8.2: Land tenancy status of farmers in Feed the Future Phase One Endline Survey



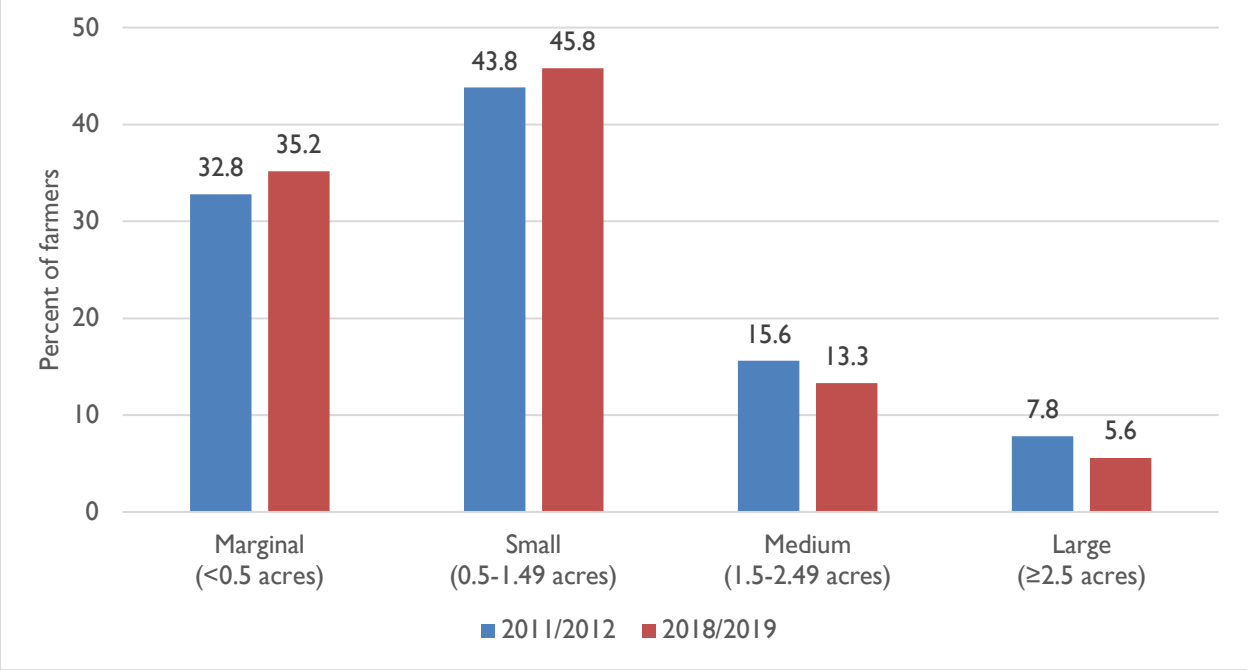
Source: Feed the Future Bangladesh ZOI Survey, 2018/2019.

8.2 Structure of land distribution by farm size groups

Using the size of operated farmland, the BIHS sample of farmers are disaggregated into four farm size groups: (1) marginal farmers (operating less than 0.5 acres of land); (2) small farmers (operating 0.5 to 1.49 acres of land); (3) medium farmers (operating 1.5 to 2.49 acres of land); and (4) large farmers (operating 2.5 acres or more of land). The four farm size groups match the cut-off points of the six operated farm size groups presented in BBS's 2010 HIES report[68] by aggregating the smallest two HIES farm size groups under the marginal farm category and the largest two groups under the large farm category.

Figures 8.3 and **8.4** show the changes in distribution of farmers and distribution of operated land by farm size groups, respectively, between 2011/2012 baseline and 2018/2019 endline in the Bangladesh ZOI. At the 2011/2012 baseline, 44 percent of all farm households in the ZOI were small farmers, which slightly increased to 46 percent at the 2018/2019 endline. The distribution of operated land is extremely unequal. At the 2011/2012 baseline, about one-third of farmers in the ZOI were marginal farmers, who operated only 8.3 percent of the total land in the ZOI. At the other extreme, only about 8 percent of all farmers were large farmers who operated about 27 percent of total land in the ZOI at baseline. While similar patterns were observed at the endline, the results indicate that the size of operated land decreased moderately as a larger percentage of farmers belonged to marginal and small groups of farmers at the endline. Furthermore, the distribution of operated land became slightly more equitable from baseline to endline. The difference in the percent of farmers between the baseline and endline is only statistically significant for large farmers (at the 5 percent level).

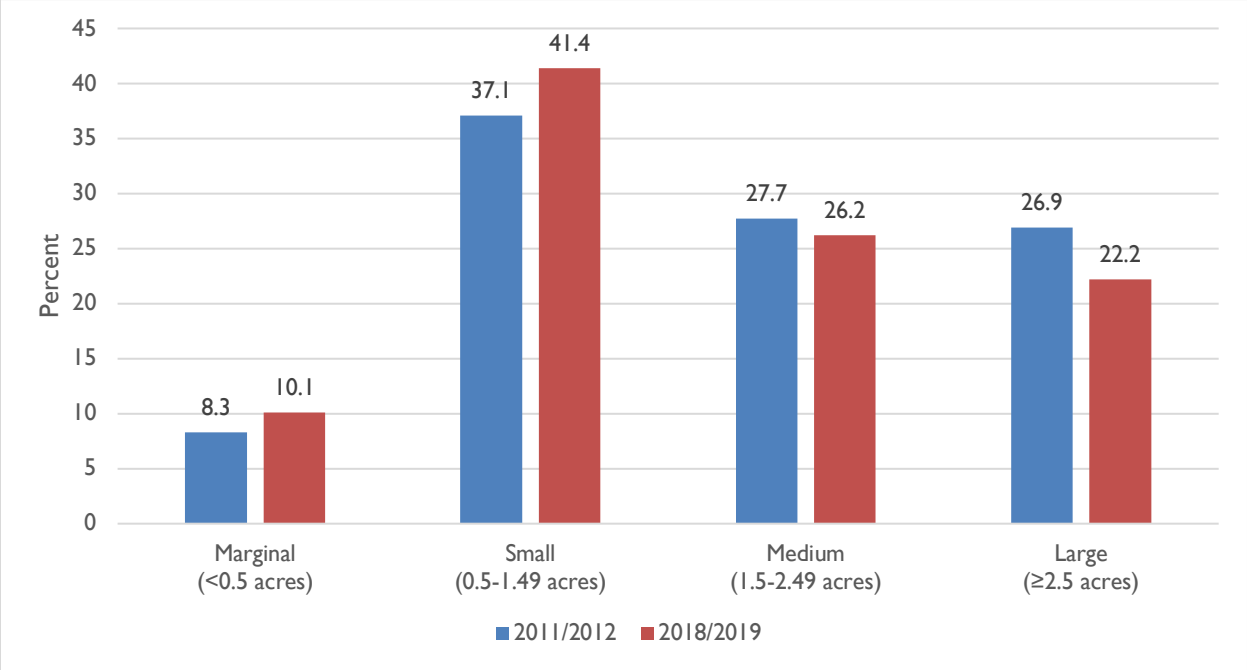
Figure 8.3: Distribution of farmers by farm size groups in Feed the Future Phase One Baseline and Endline ZOI Surveys



Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

[68] BBS (2011)

Figure 8.4: Distribution of operated land by farm size groups in Feed the Future Phase One Baseline and Endline ZOI Surveys



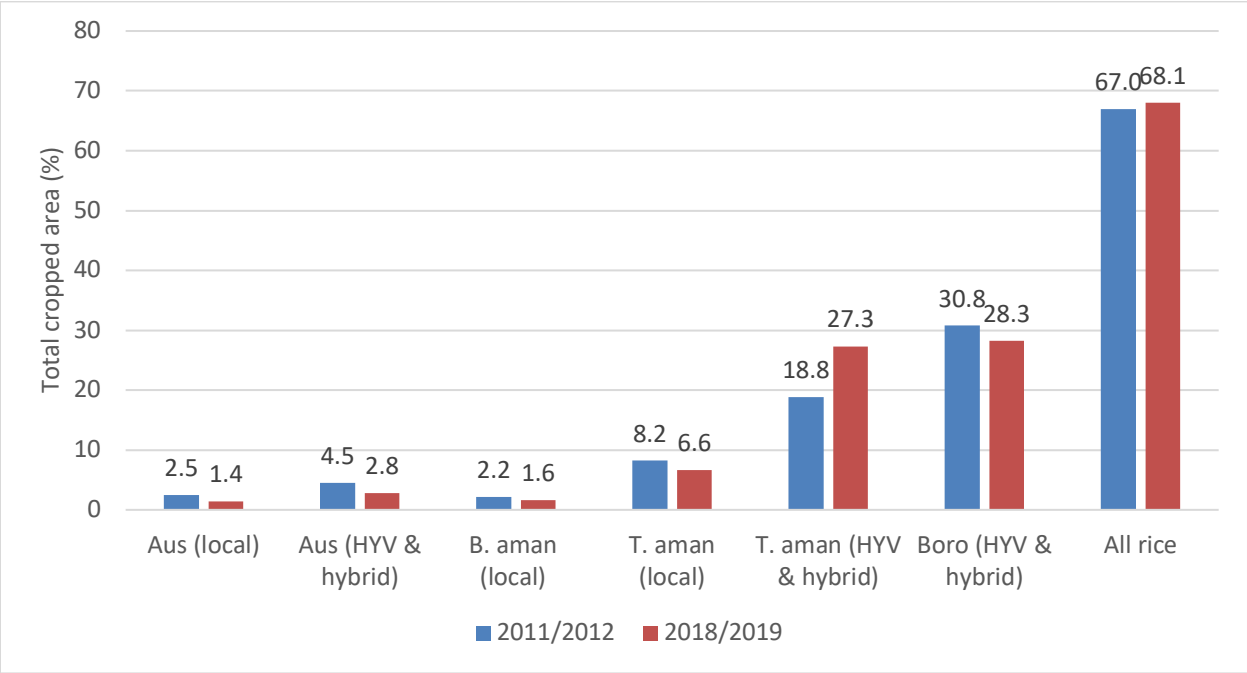
Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

8.3 Patterns of crop production

Rice is overwhelmingly dominant in the ZOI's cropping patterns. **Figure 8.5** shows that rice accounted for about 67 percent of the total cropped area at the 2011/2012 baseline. After seven years, about 69 percent of the total cropped area was still occupied by rice at the 2018/2019 endline.

Boro (HYV and hybrid) and t. aman (HYV and hybrid) are the most common rice varieties cultivated in the ZOI. Although the share of boro (HYV and hybrid) rice was dominant, occupying about 31 percent of total cropped area in the ZOI at baseline, the share dropped by 8 percent at endline. The share of t. aman (HYV and hybrid) rice increased by 45 percent from baseline to endline, which is statistically significant at the 1 percent level. The share of all other rice varieties—aus (local), aus (HYV and hybrid), b. aman (local), and t. aman (local)—decreased from baseline to endline—and these changes are not statistically significant.

Figure 8.5: Share of different types of rice in total cropped area in Feed the Future Phase One Baseline and Endline ZOI Surveys

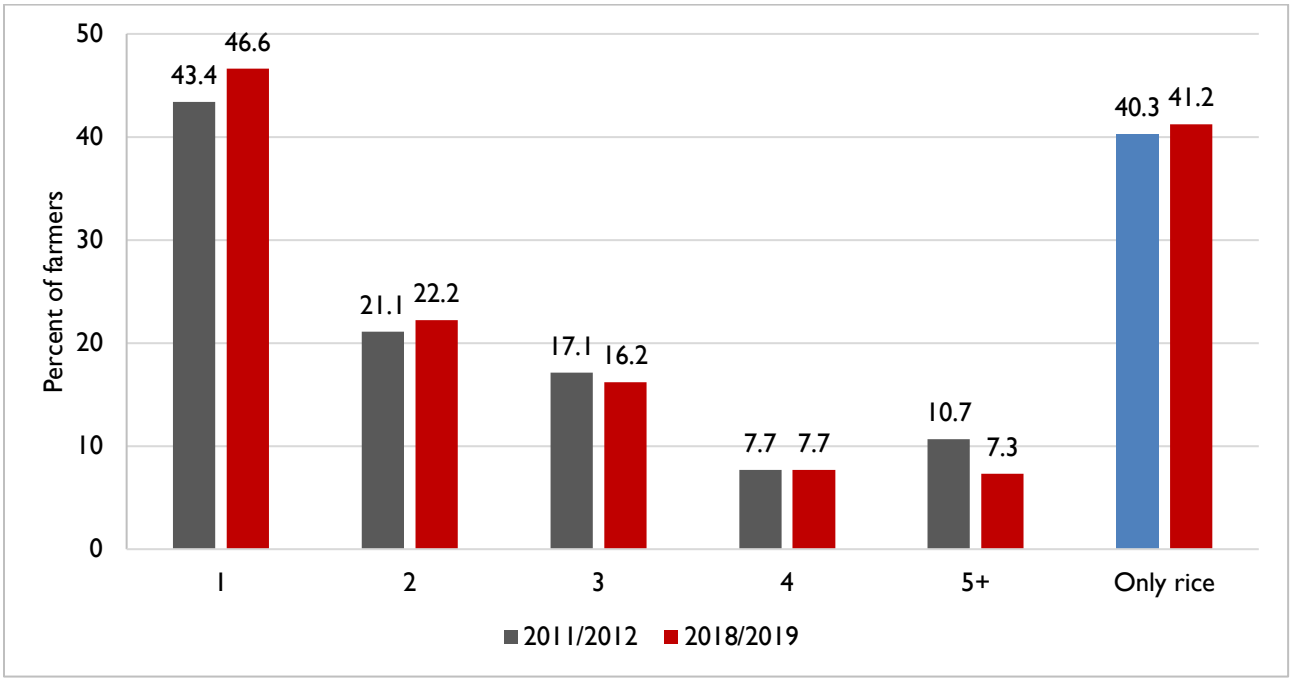


Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Indeed, crop diversification, calculated using the area-based Simpson Diversity Index (SDI), is low in the Bangladesh ZOI and remains virtually unchanged between 2011/2012 baseline and 2018/2019 endline (0.29 and 0.27, respectively). This reflects the large share of cropped land devoted to rice cultivation. The change in SDI is not statistically significant.

Figure 8.6 shows minimal changes in the number of crops grown by ZOI farmers between 2011/2012 baseline and 2018/2019 endline. Around 40 percent of the farmers cultivate only rice, indicating minimal crop diversification in the ZOI. The differences in the number of crops grown by farmers and the percentage of farmers growing only rice were not statistically significant.

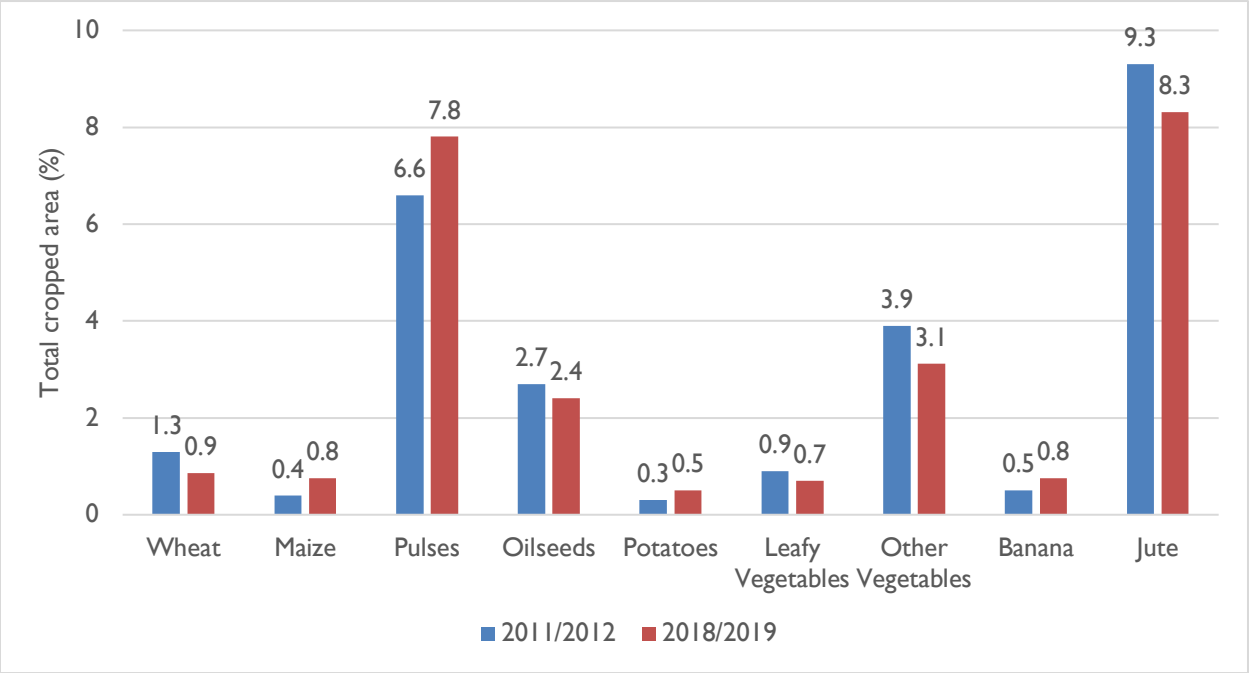
Figure 8.6: Number of crops grown by farmers in Feed the Future Phase One Baseline and Endline ZOI Surveys



Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Figure 8.7 shows cropping patterns from 2011/2012 baseline to 2018/2019 endline, as measured by share of total non-rice crops in total cropped area. Among all non-rice crops, the share of maize doubled (from 0.4 percent to 0.8 percent), largely driven by increased demand for poultry and fish feed; and the share of pulses cultivated on total cropped land increased from 6.6 percent to 7.8 percent. Except for potatoes and bananas, which increased slightly, the share of all other leading non-rice crops cultivated in the ZOI decreased, particularly the share of jute and wheat in total cropped area. Overall, the changes in share of cropped area are not statistically significant for any of the reported non-rice crops.

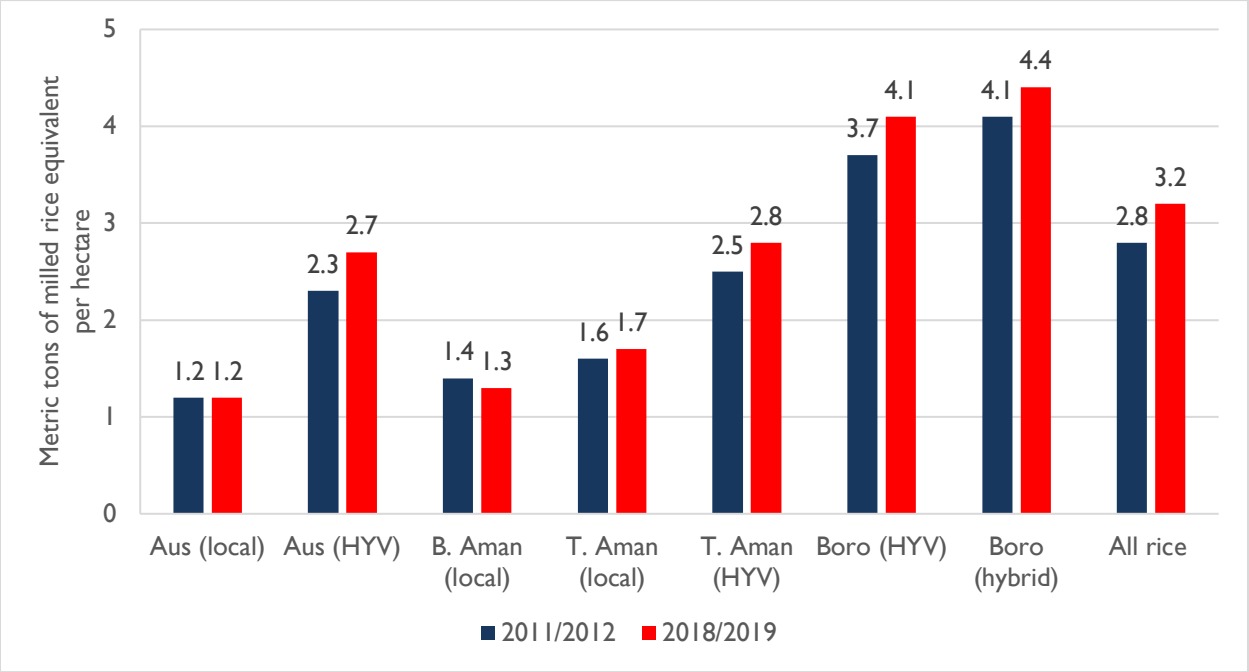
Figure 8.7: Share of non-rice crops in total cropped area in Feed the Future Phase One Baseline and Endline ZOI Surveys



Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Figure 8.8 shows trends in rice yields between 2011/2012 baseline and 2018/2019 endline in the Bangladesh ZOI, measured in metric tons (MT) of milled rice equivalent per hectare. Overall, rice yields increased by 14.3 percent from 2.8 MT to 3.2 MT per hectare. Increases in rice yields were slightly more prominent among high yielding and hybrid rice varieties. The changes in rice yields for t. aus HYV is statistically significant at the 5 percent level, significant at the 10 percent level for boro hybrid, and significant at the 1 percent level for t. aman HYV, boro HYV, and all rice.

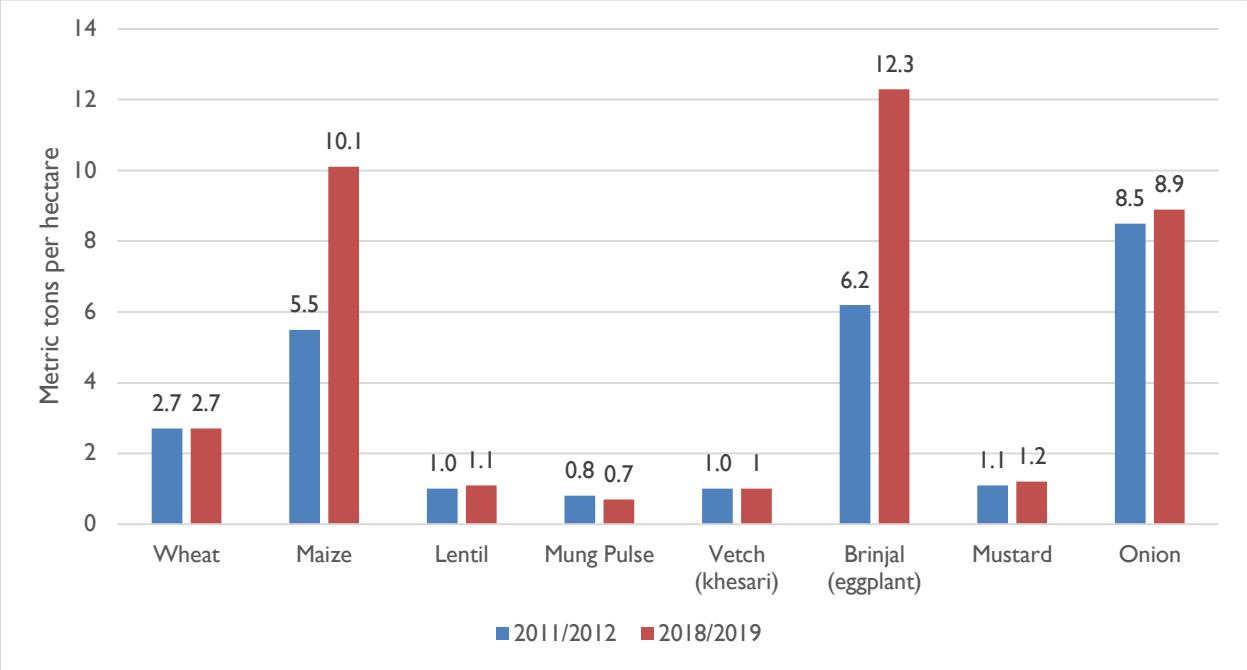
Figure 8.8: Rice yields in Feed the Future Phase One Baseline and Endline ZOI Surveys



Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Figure 8.9 shows changes in non-rice crop yields in the Bangladesh ZOI. Maize and brinjal yields nearly doubled—5.5 MT to 10.1 MT per hectare and 6.2 MT to 12.3 MT per hectare, respectively. However, the yields of all other presented non-rice crops remained relatively stagnant between 2011/2012 baseline and 2018/2019 endline. The differences in lentil yields and brinjal yields are statistically significant at the 1 percent and 5 percent levels, respectively.

Figure 8.9: Yields of selected non-rice crops in Feed the Future Phase One Baseline and Endline ZOI Surveys



Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

9. SUMMARY AND CONCLUSIONS

IFPRI researchers designed and conducted the 2011/2012 baseline and 2018/2019 endline surveys on the Feed the Future ZOI stratum of the Bangladesh Integrated Household Survey (BIHS), which assessed changes in Feed the Future's performance on the same households over time.

Overall, the Feed the Future Phase One ZOI endline survey results show significant progress between 2011/2012 baseline and 2018/2019 endline in key development indicators, including household economic status, food consumption and nutrition, and women's empowerment in agriculture.

At the endline, there were fewer ZOI households in poverty and households were not as deeply in poverty as they were at baseline. Between 2011/2012 baseline and 2018/2019 endline, the prevalence of poverty at $1.25 poverty line at 2005 PPP dropped by 37.9 percent (from 40.6 percent to 25.2 percent) in the Bangladesh Feed the Future ZOI. The depth of poverty also reduced in the ZOI from 9.3 percent at baseline to 4.6 percent at endline. The average daily per capita consumption expenditure in constant 2010 USD (a proxy for income) shows a 16.3 percent increase, from $1.78 to $2.07 between the baseline and endline.

Reductions in poverty contributed to improved living conditions among the Feed the Future ZOI households. Between baseline and endline, a greater proportion of homes were constructed with more durable materials; households had improved sanitation facilities and access to improved drinking water sources; households had greater access to electricity, which nearly doubled during this period; and there was a reduction in household crowding, measured by the number of people sleeping per room.

Educational attainment also improved. Compared with the 2011/2012 baseline, there are more school-going household members across all age groups and gender at the 2018/2019 endline. Improvements in educational attainment were larger for females and the poor. Primary school attendance among children ages 5-9 increased from 73.0 percent to 83.2 percent. At both baseline and endline, girls have higher attendance in primary and secondary education compared with boys. Notably, the rate of increase for school attendance among girls aged 10-14 was higher than boys in the same age group between baseline and endline.

The improvement in women's empowerment in the ZOI has been remarkable—only 30.5 percent of women in the Feed the Future ZOI were empowered at baseline, which increased to 68.7 percent at endline, as measured by the Abbreviated Women's Empowerment in Agriculture Index (A-WEAI). Between 2011/2012 baseline and 2018/2019 endline, the proportion of women achieving gender parity increased from 49.6 percent to 78.6 percent, and the empowerment gap between primary females and the primary males in their households reduced by 40.5 percent. These results indicate commendable improvements in gender equality within Bangladesh Feed the Future ZOI households.

The percentage of men achieving empowerment increased from 39.7 percent to 63.2 percent between the two rounds. Not only does this mean that a larger proportion of women have achieved adequate empowerment in the six A-WEAI indicators compared with men, but women became empowered at a faster rate than men between baseline and endline. The greatest gains in empowerment are observed among the poor for both men and women and among those with relatively lower educational

attainment. There is a larger percentage of the poor who became empowered compared with the non-poor. Sustaining empowerment gains requires addressing the key contributors to disempowerment that persist at the endline—namely, improving participation in community groups for both men and women and improving access to and decisions on credit for women.

There appear to be gradual shifts in gender dynamics in agriculture in the Bangladesh ZOI. Women's participation in food crop and cash-crop farming both grew substantially, whereas their participation in wage-salaried employment, for instance, dropped. There does not seem to be a consistent pattern between women's participation in economic activities and having input into decision-making in those activities. For example, while women's participation in food crop farming and cash crop farming increased significantly between baseline and endline, their input into decision-making regarding those activities decreased between the two rounds. Therefore, although more women participated in crop-related production activities, there may be scope to design and implement programs and policies to enhance women's decision-making power in agricultural production.

There were significant strides made in food consumption and nutrition in the Bangladesh Feed the Future ZOI. Hunger has been virtually eliminated in the ZOI, with the proportion of households experiencing little to no hunger increasing from 92.1 percent at baseline to 97.5 percent at endline. Hunger reduced by nearly 10 percent in female adult only households, with an increase from 87.1 percent to 95.5 percent experiencing little to no hunger. There was a modest increase in women's dietary diversity, from 4.4 to 4.9 food groups—an improvement of 12.9 percent. Women's average consumption rose by 0.6 food groups.

Although hunger has been nearly eradicated and diets are gradually diversifying in the Bangladesh ZOI, socioeconomic disparities in hunger persist. The poor and uneducated remain at risk of being hungry at the endline, with 6.6 percent of poor households and 11.7 percent of uneducated households experiencing moderate or severe hunger. Furthermore, poor women of reproductive age have lower dietary diversity compared with their non-poor counterparts at baseline and endline. Overall, while the proportion of children 6-23 months of age receiving a minimum acceptable diet has increased by 10.0 points between 2011 and 2017/2018, children of mothers with no and less than primary education generally remain worse off than children of mothers who have completed primary or higher than secondary education. Thus, while food consumption and nutrition are improving, actions are needed to ensure that the vulnerable are not left behind.

District-level Bangladesh Demographic and Health Survey (BDHS) data for the 20 ZOI districts were analyzed for select nutrition indicators. Between 2011 and 2017/2018, the prevalence of underweight women (15-49 years) decreased and the average BMI of women of reproductive age increased. At the same time, the proportion of obese women more than doubled, rising from 2.3 percent to 6.4 percent, which is a disconcerting trend. Among children under-five, the prevalence of stunting and wasting dropped (stunting: 38.6 percent to 27.0 percent; wasting: 14.2 percent to 7.4 percent). These are encouraging signs of nutritional improvements among young children in the Bangladesh ZOI.

About one-third of all farm households in the ZOI endline survey sample are "pure tenants," meaning that they do not own the land they work. Therefore, they have insecure, prohibitive, and unstable access to land through sharecropping or land-leasing arrangements, which may act as a deterrent for

technology adoption. These farmers must pay rent for the land they cultivate, which makes farming a low-profit enterprise for them. They likely remain in agriculture because of a lack of alternative employment opportunities. Changing this would require the creation of nonfarm employment opportunities in higher-productivity sectors. Such job creation could be accomplished by promoting agro-processing enterprises through provision of credit, accelerating the development of rural-urban food value chains, and providing skills development for repair and maintenance of farm machinery through appropriate vocational training for rural youth.

Rice is overwhelmingly dominant in the cropping patterns in the ZOI. Crop diversity is low and remains virtually unchanged between the 2011/2012 baseline and the 2018/2019 endline. Year-to-year price fluctuations are much larger for non-rice crops than for rice, indicating relatively high levels of market-induced risks for production of non-rice crops, such as fruits and vegetables.[69] Strategies that balance the intensification of rice production and crop diversification should be prioritized, which may help meet the caloric and nutritional demands of the population, as well as improve farmers' incomes by cultivating more profitable, yet risky crops. One option for facilitating crop diversification is contract farming, which can protect farmers from the price risks of producing high-value crops. Under this arrangement, the farmer provides agreed-upon quantities of an agricultural product to an agribusiness firm, based on the quality standards and delivery requirements of the firm, usually at a price negotiated and established in advance. Agribusiness firms may also agree to support the farmers through input supply, credit, extension advice, and transporting produce to their premises.[70] Despite its potential, very few contract-farming models have been adopted in Bangladesh. Carefully designed research is needed to reveal the constraints to crop diversity and to formulate appropriate policies to remove them. In summary, this Feed the Future endline assessment indicates that development gains have been largely broad-based and have benefitted priority populations—namely, women and the poor—in many ways. Moving forward, the five-year U.S. Global Food Security Strategy (GFSS) Bangladesh Country Plan, which prioritizes improving nutrition for women and children, strengthening resilience, and improving agriculture-led economic growth, has great potential to build upon these achievements and accelerate progress.

[69] Ahmed and Ghostlaw (2019)

[70] Eaton and Shepherd (2001)

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APPENDIX 1. SUPPLEMENTARY DATA

A1.1 ZOI Survey 2018/2019 Feed the Future indicator estimates

Table A1.1 presents Feed the Future Phase One Zone of Influence indicators at endline—in total and by key disaggregates. The table also presents for each indicator and key disaggregate: standard deviation (SD), 95 percent confidence interval (CI), design effect, inter-cluster correlation coefficient, non-response rate, weighted number of observations, unweighted number of observations, and the p-value for the statistical test performed to assess differences among disaggregate categories.

Table A1.1: Feed the Future Phase One ZOI Indicator Estimates, by Key Disaggregates: Bangladesh 2018/2019

Indicator	Est.	SD	95% CI	DEFF	ICC	Non-response rate[a]		Weighted number	Unweighted number[b]
Mean daily per capita consumption expenditures in constant 2010 USD (2005 PPP)						**Baseline**	**Endline**		
All households	2.07	1.05	2.01 – 2.14	2.35	0.07	0.00	0.96	2,064	2,064
Gendered household type									
Male and female adults	2.04	0.99	1.98 – 2.11	2.25	0.07	0.00	0.74	1,820	1,738
Female adults only	2.27	1.43	2.11 – 2.43	3.62	0.14	0.00	2.12	238	313
Male adults only	^	^	^	^	^	^	^	6	12
Children only	^	^	^	^	^	^	^	0	1
Prevalence of poverty: Percentage of people living on less than $1.25/day (2005 PPP)									
All households	25.2		22.3 – 28.1	2.1	0.1	0.0	1.0	2,064	2,064
Gendered household type									
Male and female adults	25.5		22.4 – 28.5	2.2	0.1	0.0	0.7	1,820	1,738
Female adults only	23.7		19.2 – 28.3	4.2	0.2	0.0	2.1	238	313
Male adults only	^		^	^	^	^	^	6	12
Children only	^		^	^	^	^	^	0	1
Depth of poverty: Mean percentage shortfall relative to $1.25/day poverty line (2005 PPP)									
All households	4.6		3.8 – 5.3	1.9	0.0	0.0	1.0	2,064	2,064
Gendered household type									
Male and female adults	4.6		3.8 – 5.4	2.0	0.1	0.0	0.7	1,820	1,738
Female adults only	4.6		3.4 – 5.9	3.0	0.1	0.0	2.1	238	313
Male adults only	^		^	^	^	^	^	6	12
Children only	^		^	^	^	^	^	0	1
Abbreviated Women's Empowerment in Agriculture Index[c]									
All women	0.89		0.88 – 0.90	4.40	0.18	0.00	0.00	1,835	1,831
Women's age									
18-29 years	0.87		0.85 – 0.90	4.64	0.19	0.00	0.00	315	323
30 years or older	0.90		0.88 – 0.91	4.60	0.19	0.00	0.00	1,520	1,508
Prevalence of moderate and severe hunger									
All households	2.5		1.7 – 3.3	1.7	0.0	0.0	1.0	2,064	2,064
Gendered household type									
Male and female adults	2.1		1.3 – 2.8	3.0	0.0	0.0	0.7	1,719	1,738
Female adults only	4.5		2.3 – 6.7	3.4	0.1	0.0	2.1	334	313
Male adults only	^		^	^	^	^	^	10	12
Children only	^		^	^	^	^	^	1	1
Women's dietary diversity: Mean number of food groups consumed by women of reproductive age[d]									
All women 15-49 years of age	4.9	1.0	4.8 – 5.0	4.3	0.1	4.0	5.9	2,151	2,151
Prevalence of exclusive breastfeeding among children under 6 months of age[d]									
All children	52.7	50.0	44.9 – 60.5	1.5	0.1	0.0	0.0	236	236
Children's sex									

Male	50.5	50.2	40.7 – 60.2	1.3	0.1	0.0	0.0	133	135
Female	55.5	49.9	44.6 – 66.5	1.3	0.0	0.0	0.0	103	101
Prevalence of children 6-23 months of age receiving a minimum acceptable diet[d]									
All children	35.2	47.8	31.2 – 39.1	1.0	0.0	0.2	0.0	537	537
Children's sex									
Male	33.9	47.4	27.9 – 39.9	1.1	0.0	0.4	0.0	259	265
Female	36.3	48.2	29.4 – 43.2	1.5	0.0	0.0	0.0	278	272
Prevalence of underweight women of reproductive age[d]									
All non-pregnant women 15-49 years of age	11.0	31.3	9.6 – 12.3	2.2	0.0	3.2	1.2	4,627	4,627
Prevalence of stunted children under 5 years of age[d]									
All children	27.0	44.4	24.1 – 30.0	2.0	0.0	11.8	8.0	1,773	1,769
Children's sex									
Male	25.6	43.6	22.0 – 29.1	1.5	0.0	13.3	7.9	906	913
Female	28.6	45.2	24.2 – 33.0	2.0	0.0	10.2	8.1	867	856
Prevalence of wasted children under 5 years of age[d]									
All children	7.4	26.2	6.0 – 8.8	1.3	0.0	11.8	8.3	1,770	1,763
Children's sex									
Male	7.8	26.9	6.0 – 9.7	1.1	0.0	13.3	8.4	904	908
Female	7.0	25.5	4.9 – 9.0	1.4	0.0	10.2	8.2	866	855
Prevalence of underweight children under 5 years of age[d]									
All children	17.5	38.0	15.2 – 19.7	1.6	0.0	11.8	6.5	1,799	1,797
Children's sex									
Male	16.0	36.7	13.4 – 18.7	1.3	0.1	13.3	6.2	923	930
Female	19.0	39.3	15.5 – 22.5	1.7	0.0	10.2	6.9	876	867

DEFF=design effect; Est.=estimate; n/a=not applicable; PPP=purchasing power parity; ICC=intercluster correlation
^ Results not statistically reliable, n<30
[a] Non-response rate is defined as: (Number of eligible individuals or households – Number of individuals or households included in the reported indicator)/Number of eligible individuals or households.
[b] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.
[c] The Women's Empowerment in Agriculture Index was calculated at baseline, but only data for the Abbreviated Women's Empowerment in Agriculture Index (A-WEAI) were collected at endline. Therefore, a baseline value for the A-WEAI was calculated so that endline-baseline comparisons could be made.
[d] Disaggregates based on individual household members (i.e., children's sex) are calculated using de jure household members.
Notes:
BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.
Estimates are sample-weighted.
Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018; Feed the Future Bangladesh ZOI Survey, 2018/2019.

A1.2 Supplementary results tables

Appendix 1.2 presents supplementary results tables by report chapter.

Chapter 2: Methodologies

Table A1.2.1: Comparison of Response Rates in the Phase One ZOI, by Module, Feed the Future Phase One Baseline and Endline ZOI Surveys

Response rate[a]	Baseline (2011/2012)	Endline (2018/2019)
Module 1: Household roster		
Number of households selected	2,040	2,202
Number of households occupied	2,040	2,070
Number of households interviewed	2,040	2,064
Household response rate (%)	100.00	99.71
Module 2: Dwelling characteristics		
Number of eligible households	2,040	2,070
Number of eligible households interviewed	2,040	2,064
Module 2 response rate (%)	100.00	99.71
Module 3: Resilience and food security		
Number of eligible households	2,040	2,070
Number of eligible households interviewed	2,040	2,064
Module 3 response rate (%)	100.00	99.71
Module 4: Women's nutrition		
Number of eligible women (15-49 years of age)	2,213	2,286
Number of eligible women interviewed	2,125	2,151
Module 4 response rate (%)	96.02	94.09
Module 4A: Women's anthropometry		
Number of eligible women (15-49 years of age, non-pregnant	4,443	4,549
Number of eligible interviewed	4,307	4,491
Module 4A response rate (%)	96.94	98.72
Module 5: Children's nutrition		
Number of eligible children (6-23 months of age)	542	511
Number of caregivers of eligible interviewed	522	499
Module 5 response rate (%)[b]	96.31	97.65
Module 5A: Children's anthropometry		
Number of eligible children (0-59 months of age)	1,863	1,723
Number of eligible children interviewed	1,734	1,647
Module 5A response rate (%)	93.08	95.59
Module 6A: A-WEAI, women		
Number of eligible women	2,079	2,064

Number of eligible women interviewed	2,078	2,051
Module 6A response rate (%)	99.95	99.37
Module 6B: A-WEAI, men		
Number of eligible men	1,763	1,777
Number of eligible men interviewed	1,762	1,755
Module 6B response rate (%)	99.94	98.76
Module 8: Consumption expenditures		
Number of eligible households	2,040	2,070
Number of eligible households interviewed	2,040	2,064
Module 8 response rate (%)	100.00	99.71

[a] Module response rates are calculated based on the module outcome codes, except where otherwise noted. The response rates are defined as the number of eligible individuals or households interviewed divided by the number of eligible individuals or households. All occupied households are eligible for Modules 1, 2, 3, and 8. Eligibility determination for Modules 4, 4A, 5, 5A, and 6 is initiated in the household roster and confirmed in the respective module. Note that for Module 5, the primary caregivers of the children served as the respondents, not the children directly.

[b] Module 4A does not include an outcome code, so the module is considered to be complete if the currently pregnant field is complete, and the height and weight fields have values less than 999.4.

[c] Module 5A does not include an outcome code, so the module is considered to be complete if the length or height field is complete, the height field has a value less than 999.4, and the weight field has a value less than 99.94.

Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018; Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Chapter 3: Population in the ZOI

Table A1.3.1: Household Demographic Characteristics in the Phase One ZOI, by Gendered Household Type, Feed the Future Phase One Endline ZOI Survey 2018/2019

Characteristic	Gendered household type			
	Male and female adults	Female adults only	Male adults only	Children only
Mean household size	4.21	2.83	^	^
Mean number of children under 2 years of age	0.14	0.08	^	^
Mean number of children under 5 years of age	0.35	0.27	^	^
Mean number of children 5 years of age or older (5-17 years)	1.13	1.23	^	^
Mean number of youth (15-29 years)	0.92	0.53	^	^
Mean number of women of reproductive age (15-49 years)	1.09	1.04	^	^
Mean number of adult male household members[a]	1.34	0.00	^	^
Mean number of adult female household members[a]	1.39	1.32	^	^
Percent of adults who are male (%)[a]	49.18	0.00	^	^
Percent of adults who are female (%)[a]	50.82	100.00	^	^
Highest household educational attainment (%)				
No education	4.83	11.13	^	^
Less than primary	9.29	13.94	^	^
Completed primary	51.76	53.98	^	^
Completed secondary	16.45	12.56	^	^
Higher	17.67	8.38	^	^
Number of households	1,738	313	12	1

^ Results not statistically reliable, n<30

[a] Feed the Future defines adult as an individual 18 years of age or older. Females and males 15-17 years of age are of reproductive age but are not considered adults by this definition.

Note: Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members (i.e., gendered household type) are calculated using de jure household members.

Source: Feed the Future Bangladesh ZOI Survey 2018/2019.

Table A1.3.2: Characteristics of Primary Adult Female and Male Decision-makers in the Phase One ZOI, Feed the Future Phase One Endline Survey 2018/2019

Characteristic	Female		Male	
	%	n[a]	%	n[a]
Age				
18-24	4.42	124	3.33	64
25-29	12.63	250	5.18	103
30-39	30.55	585	20.20	351
40-49	27.33	548	27.89	460
50-59	15.60	342	21.76	381
60+	9.47	198	21.64	390
Marital status				
Married	89.47	1,837	93.82	1,650
Living in a consensual union	0.00	0	0.00	0
Widowed	9.37	188	1.85	31
Divorced or separated	1.09	21	0.21	4
Never married or in a union	0.07	1	4.11	64
Education				
No education	33.85	718	37.82	673
Less than primary	15.55	318	14.48	259
Completed primary	43.47	870	34.43	599
Completed secondary	4.34	86	6.07	102
Higher	2.80	55	7.20	116
Economic activity[b]				
Participates in some form of economic activity	93.79	1,912	97.36	1,696
Participation in economic activity by type[c]				
Farm	91.44	1,866	88.36	1,536
Non–farm	13.63	276	44.70	777
Wage/salaried	11.84	239	45.84	804
Number of primary adult decision-makers		2,047		1,749

^ Results not statistically reliable, n<30

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, the sum of disaggregate sample sizes may not equal the overall sample size.

[b] Both paid and unpaid types of economic activity are included. Domestic work, such as caring for children or the elderly and cooking and cleaning, are not included.

[c] Farm work includes food crop farming, cash crop farming, livestock raising, or fishing/fishpond culture; non-farm work includes running small businesses or self-employment; and wage/salaried employment includes both agriculture and non-agriculture-based work that is salaried. Percentages do not add up to 100 percent because individuals can engage in more than one type of economic activity.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Economic activity figures are based on 2,040 observations for females at endline because of incomplete WEAI modules.

Source: Feed the Future Bangladesh ZOI Survey, 2018/2019.

Table A1.4.1.1: Comparison of Average Consumption Shortfall of the Poor at the $1.25 (2005 PPP) Per Person Per Day Threshold in the Phase One ZOI, USD (2005 PPP), in Total and by Selected Household Characteristics, Feed the Future Phase One Baseline and Endline ZOI Surveys

	Baseline (2011/2012)			Endline (2018/2019)					
Characteristic	USD (2005 PPP)	95% CI	n[a]	USD (2005 PPP)	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
All households	0.29	0.27 — 0.30	758	0.23	0.21 — 0.25	444	-0.06	0.000	***
Gendered household type									
Male and female adults	0.28	0.27 — 0.30	650	0.23	0.20 — 0.25	382	0.06	0.000	***
Female adults only	0.32	0.27 — 0.36	107	0.24	0.20 — 0.28	62	-0.07	0.014	*
Male adults only	^	^	1	^	^	0	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Household education									
No education*	0.35	0.29 — 0.42	62	^	^	21	n/a	n/a	n/a
Less than primary	0.34	0.31 — 0.36	217	0.26	0.20 — 0.32	62	-0.07	0.025	*
Completed primary	0.26	0.24 — 0.28	403	0.22	0.20 — 0.24	279	-0.04	0.007	**
Completed secondary	0.26	0.20 — 0.32	51	0.22	0.17 — 0.26	53	-0.04	0.287	n/s
Higher*	0.26	0.20 — 0.31	25	^	^	29	n/a	n/a	n/a
Household hunger									
Little to no hunger	0.27	0.26 — 0.28	641	0.22	0.20 — 0.24	415	-0.05	0.000	***
Moderate hunger*	0.38	0.33 — 0.43	99	^	^	26	n/a	n/a	n/a
Severe hunger	^	^	18	^	^	3	^	^	^

CI=confidence interval; Diff.=difference; n/a=not applicable; n/s=not significant; PPP=purchasing power parity

^ Results not statistically reliable, n<30

*As select estimates are not presented because the results are not statistically reliable, the difference, p-value, and significance could not be calculated; thus, these data are not applicable.

[a] The "n" reflects the unweighted number of households—not the number of household members—even though the average consumption shortfall of the poor measures the percentage of the poverty line at which poor individuals live and the average value of consumption of poor individuals. Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members.

Significance tests were performed to determine whether a difference exists between the baseline and endline estimates. Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

The average consumption shortfall of the poor is the average amount below the poverty threshold of a person in poverty. This value is estimated only among individuals living in households that fall below the poverty threshold.

The average consumption shortfall of the poor, expressed in USD (2005 PPP), was calculated by first subtracting the per capita daily consumption expenditure in local currency units (LCU) for the year and month of the ZOI Survey of each poor household in the sample from the $1.25 per day poverty line in LCU for the year and month of the ZOI Survey. The figure was then converted to 2005 prices by multiplying by the ratio of the 2005 Basic Needs Price Index (BNPI) LCU and the BNPI for the year and month of the ZOI Survey LCU, where 2011-12 BNPI LCU=202.96, 2018-19 BNPI LCU =289.04 and 2005 BNPI LCU=100. The resulting figure was converted to 2005 USD by dividing by the 2005 PPP conversion rate of Bangladesh where LCU 2005 PPP= 25.49389. Finally, after applying the household member sampling weight, the value for each poor household was summed across all poor households and then divided by the sum of the number of all poor sampled households with consumption data.
Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table A1.4.1.2: Comparison of Average Consumption Shortfall of the Poor at the USD $1.25 (2005 PPP) Per Person Per Day Threshold in the Phase One ZOI, Percent of Poverty Line, in Total and by Selected Household Characteristics, Feed the Future Phase One Baseline and Endline ZOI Surveys

	Baseline (2011/2012)			Endline (2018/2019)					
Characteristic	% of poverty line	95% CI	n[a]	% of poverty line	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
All households	22.9	21.9 — 23.9	758	18.2	16.6 — 19.8	446	-4.7	0.000	***
Gendered household type									
Male and female adults	22.6	21.5 — 23.6	650	18.0	16.3 — 19.7	384	-4.6	0.000	***
Female adults only	25.4	22.0 — 28.9	107	19.5	16.4 — 22.7	62	-5.9	0.014	*
Male adults only	^	^	1	^	^	0	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Household education									
No education*	28.4	23.4 — 33.4	62	^	^	21	n/a	n/a	n/a
Less than primary	26.9	24.8 — 29.1	217	21.0	16.4 — 25.7	62	-5.9	0.025	*
Completed primary	20.8	19.5 — 22.1	403	18.0	16.4 — 19.6	279	-2.8	0.007	**
Completed secondary	20.6	15.7 — 25.4	51	17.3	13.8 — 20.8	53	-3.2	0.287	n/s
Higher*	20.5	15.9 — 25.1	25	^	^	29	n/a	n/a	n/a
Household hunger									
Little to no hunger	21.5	20.5 — 22.5	641	17.7	16.1 — 19.3	415	-3.8	0.000	***
Moderate hunger*	30.3	26.3 — 34.3	99	^	^	26	n/a	n/a	n/a
Severe hunger	^	^	18	^	^	3	^	^	^

CI=confidence interval; Diff.=difference, n/a=not applicable; n/s=not significant

^ Results not statistically reliable, n<30

[a] The "n" reflects the unweighted number of households—not the number of household members—even though the average consumption shortfall of the poor measures the percentage of the poverty line at which poor individuals live and the average value of consumption of poor individuals. Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

*As some estimates are not presented because the results are not statistically reliable, the differences, p-value, and significance could not be calculated.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted. Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members. Significance tests were performed to determine whether a difference exists between the baseline and endline estimates. Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

The average consumption shortfall of the poor is the average amount below the poverty threshold of a person in poverty. This value is estimated only among individuals living in households that fall below the poverty threshold. The average consumption shortfall of the poor, expressed as a percentage of the poverty line, was calculated by first subtracting the per capita daily consumption expenditure in LCU for the year and month of the ZOI Survey of each poor household in the sample from the $1.25 per day poverty line in LCU for the year and month of the ZOI Survey. The figure was then divided by the $1.25 per day poverty line in LCU for the year and month of the ZOI Survey. Finally, after applying the household

member sampling weight, the value for each poor household was summed across all poor households and then divided by the sum of the number of all poor sampled households with consumption data.
Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table A1.4.2.1: Comparison of Average Consumption Shortfall of the Poor in the Phase One ZOI at the National Extreme Threshold of Bangladesh[d] in rural Barishal and rural Khulna divisions, in 2010 and 2016, in USD (2005 PPP), by Total and by Selected Household Characteristics, Household Income and Expenditure Surveys (HIES)

	Baseline (2010)			Endline (2016)					
Characteristic	USD (2005 PPP)	95% CI	n[a]	USD (2005 PPP)	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
All households	0.18	0.16 – 0.19	317	0.15	0.14 – 0.16	980	-0.02	0.008	**
Gendered household type									
Male and female adults	0.18	0.16 – 0.19	296	0.15	0.14 – 0.16	903	-0.03	0.006	**
Female adults only*	^	^	19	0.20	0.14 – 0.25	69	n/a	n/a	n/a
Male adults only	^	^	2	^	^	8	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Household education									
No education	0.22	0.19 – 0.26	83	0.19	0.16 – 0.22	104	-0.03	0.153	n/s
Less than primary	0.18	0.14 – 0.23	42	0.19	0.16 – 0.21	182	0.01	0.871	n/s
Completed primary	0.16	0.14 – 0.18	166	0.14	0.13 – 0.16	555	-0.02	0.123	n/s
Completed secondary*	^	^	20	0.14	0.11 – 0.17	71	n/a	n/a	n/a
Higher*	^	^	6	0.13	0.10 – 0.16	68	n/a	n/a	n/a
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

CI=confidence interval; n/a=not applicable; PPP=purchasing power parity; n/a=not applicable; n/s=not significant
^ Results not statistically reliable, n<30
— = Data are not available as these data were not collected.
* As the baseline estimates are not presented because the results are not statistically reliable, the difference, p-value, and significance could not be calculated.
[a] The "n" reflects the unweighted number of households—not the number of household members—even though the average consumption shortfall of the poor measures the percentage of the poverty line at which poor individuals live and the average value of consumption of poor individuals. Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.
[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n.s.
[d] Lower poverty line for rural Barishal and rural Khulna divisions were used for calculating the estimates in this table (BBS, 2010; BBS, 2016)

Notes: Estimates are sample-weighted; numbers of observations are unweighted.
Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members. The average consumption shortfall of the poor is the average amount below the poverty threshold of a person in poverty. This value is estimated only among individuals living in households that fall below the poverty threshold. The average consumption shortfall of the poor, expressed in USD (2005 PPP), was calculated by first subtracting the per capita monthly consumption expenditure in local currency units (LCU) of each poor household in the sample from the lower poverty line in LCU for the year of the HIES. The figure was then converted to 2005 prices by multiplying by the ratio of 2005 national upper poverty line and the stratum upper poverty line for the year of the HIES. The 2010 Barishal rural upper poverty line was LCU=1,485; 2010 Khulna rural upper poverty line was LCU = 1,435; 2016 Barishal rural upper poverty line was LCU = 2,056; 2016 Khulna rural upper poverty line was LCU = 2,019; and 2005 national upper poverty line was LCU=859.10. The resulting figure was converted to 2005 USD by dividing by the 2005 PPP conversion rate of Bangladesh, which is equal to 25.494. Finally, after applying the household member sampling weight, the value for each poor household was summed across all poor households and then divided by the sum of the number of all poor sampled households with consumption data.
Source: Household Income and Expenditure Survey (HIES), 2010 and 2016.

Table A1.4.2.2: Comparison of Average Consumption Shortfall of the Poor in the Phase One ZOI at the National Extreme Threshold of Bangladesh[d] in rural Barishal and rural Khulna divisions, in 2010 and 2016, Percent of Poverty Line, in Total and by Selected Household Characteristics, Household Income and Expenditure Surveys (HIES)

	Baseline (2010)			Endline (2016)					
Characteristic	% of poverty line	95% CI	n[a]	% of poverty line	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
All households	19.0	17.3 – 20.6	317	16.4	15.4 – 17.4	980	-2.5	0.009	**
Gendered household type									
Male and female adults	18.9	17.3 – 20.6	296	16.2	15.2 – 17.2	903	-2.7	0.007	**
Female adults only*	^	^	19	21.1	15.1 – 27.1	69	n/a	n/a	n/a
Male adults only	^	^	2	^	^	8	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Household education									
No education	23.9	20.3 – 27.4	83	20.2	16.6 – 23.8	104	-3.6	0.157	n/s
Less than primary	19.7	15.0 – 24.3	42	20.0	17.6 – 22.5	182	0.4	0.889	n/s
Completed primary	17.3	15.2 – 19.4	166	15.4	14.1 – 16.7	555	-1.9	0.135	n/s
Completed secondary*	^	^	20	15.2	11.7 – 18.7	71	n/a	n/a	n/a
Higher*	^	^	6	13.9	10.6 – 17.2	68	n/a	n/a	n/a
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

CI=confidence interval; Diff.=difference; n/a=not applicable; n/s=not significant
^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.
[*] As the baseline estimates are not presented because the results are not statistically reliable, the difference, p-value, and significance could not be calculated.
[a] The "n" reflects the unweighted number of households—not the number of household members—even though the average consumption shortfall of the poor measures the percentage of the poverty line at which poor individuals live and the average value of consumption of poor individuals. Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.
[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[c] Differences found to be statistically significant are indicated by level: * $p<0.05$, ** $p<0.01$, *** $p<0.001$. Differences found to be statistically insignificant are indicated as n/s.
[d] Lower poverty line for rural Barishal and rural Khulna divisions were used for calculating the estimates in this table (BBS, 2010; BBS 2016)
Notes:
Estimates are sample-weighted; numbers of observations are unweighted.
Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members. The average consumption shortfall of the poor is the average amount below the poverty threshold of a person in poverty. This value is estimated only among individuals living in households that fall below the poverty threshold.
The average consumption shortfall of the poor, expressed as a percentage of the national extreme poverty line, was calculated by first subtracting the per capita monthly consumption expenditure in LCU for the year of the HIES of each poor household in the sample from the lower poverty line in LCU for the year of the HIES. The figure was then divided by the lower poverty line in LCU for the year of the HIES. Finally, after applying the household member sampling weight, the value for each poor household was summed across all poor households and then divided by the sum of the number of all poor sampled households with consumption data.
Source: Household Income and Expenditure Survey (HIES), 2010 and 2016.

Table A1.4.3.1: Comparison of Average Consumption Shortfall of the Poor in the Phase One ZOI at the National Threshold of Bangladesh in rural Barishal and rural Khulna divisions, in 2010 and 2016, USD (2005 PPP), in Total and by Selected Household Characteristics, Household Income and Expenditure Surveys (HIES)

	Baseline (2010)			Endline (2016)					
Characteristic	USD (2005 PPP)	95% CI	n[a]	USD (2005 PPP)	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
All households	0.24	0.22 – 0.25	549	0.21	0.20 – 0.22	1,912	-0.03	0.002	**
Gendered household type									
Male and female adults	0.24	0.22 – 0.25	519	0.21	0.20 – 0.22	1,776	-0.03	0.002	**
Female adults only*	^	^	28	0.25	0.20 – 0.30	124	n/a	n/a	n/a
Male adults only	^	^	2	^	^	12	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Household education									
No education	0.30	0.27 – 0.33	124	0.26	0.22 – 0.29	181	-0.04	0.068	n/s
Less than primary	0.27	0.23 – 0.31	66	0.26	0.24 – 0.28	308	-0.01	0.782	n/s
Completed primary	0.22	0.21 – 0.24	299	0.20	0.19 – 0.21	1,135	-0.02	0.029	*
Completed secondary	0.21	0.15 – 0.26	39	0.19	0.16 – 0.21	151	-0.02	0.489	n/s
Higher*	^	^	21	0.19	0.17 – 0.22	137	n/a	n/a	n/a
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

CI=confidence interval; n/a=not applicable; n/s=not significant; PPP=purchasing power parity

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

*As the baseline estimates are not presented because the results are not statistically reliable, the difference, p-value, and significance could not be calculated.

[a] The "n" reflects the unweighted number of households—not the number of household members—even though the average consumption shortfall of the poor measures the percentage of the poverty line at which poor individuals live and the average value of consumption of poor individuals. Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[d] Upper poverty line for rural Barishal and rural Khulna divisions were used for calculating the estimates in this table (BBS, 2010; BBS 2016)

Notes: Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members. The average consumption shortfall of the poor is the average amount below the poverty threshold of a person in poverty. This value is estimated only among individuals living in households that fall below the poverty threshold. The average consumption shortfall of the poor, expressed in USD (2005 PPP), was calculated by first subtracting the per capita monthly consumption expenditure in local currency units (LCU) of each poor household in the sample from the upper poverty line in LCU for the year of the HIES. The figure was then converted to 2005 prices by multiplying by the ratio of the 2005 national upper poverty line and the stratum upper poverty line for the year of the HIES. The 2010 Barishal rural upper poverty line was LCU=1,485,

2010 Khulna rural upper poverty line was LCU = 1,435, 2016 Barishal rural upper poverty line was LCU = 2,056; 2016 Khulna rural upper poverty line was LCU = 2,019; and 2005 national upper poverty line was LCU=859.10. The resulting figure was converted to 2005 USD by dividing by the 2005 PPP conversion rate of Bangladesh, which is equal to 25.494. Finally, after applying the household member sampling weight, the value for each poor household was summed across all poor households and then divided by the sum of the number of all poor sampled households with consumption data.
Source: Household Income and Expenditure Survey (HIES), 2010 and 2016.

Table A1.4.3.2: Comparison of Average Consumption Shortfall of the Poor in the Phase One ZOI at the National Threshold of Bangladesh[d] in rural Barishal and rural Khulna divisions, in 2010 and 2016, Percent of Poverty Line, in Total and by Selected Household Characteristics, Household Income and Expenditure Surveys (HIES)

	Baseline (2010)			Endline (2016)					
Characteristic	% of poverty line	95% CI	n[a]	% of poverty line	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
All households	21.3	20.0 – 22.7	549	18.9	18.1 – 19.6	1,912	-2.5	0.002	**
Gendered household type									
Male and female adults	21.2	19.9 – 22.6	519	18.7	18.0 – 19.5	1,776	-2.5	0.002	**
Female adults only	^	^	28	22.2	17.7 – 26.7	124	n/a	n/a	n/a
Male adults only	^	^	2	^	^	12	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Household education									
No education	27.1	24.0 – 30.2	124	23.1	20.2 – 26.0	181	-4.0	0.068	n/s
Less than primary	24.2	20.4 – 27.9	66	23.6	21.6 – 25.6	308	-0.6	0.783	n/s
Completed primary	20.0	18.2 – 21.7	299	17.8	16.9 – 18.7	1,135	-2.2	0.029	*
Completed secondary	18.6	13.9 – 23.2	39	16.7	14.3 – 19.2	151	-1.8	0.490	n/s
Higher*	^	^	21	17.7	15.3 – 20.2	137	n/a	n/a	n/a
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

CI=confidence interval; Diff.=difference; n/a=not applicable; n/s=not significant
^ Results not statistically reliable, n<30
*As select estimates are not presented because the results are not statistically reliable, the difference, p-value, and significance could not be calculated; thus, these data are not applicable."
— = Data are not available as these data were not collected.
[a] The "n" reflects the unweighted number of households—not the number of household members—even though the average consumption shortfall of the poor measures the percentage of the poverty line at which poor individuals live and the average value of consumption of poor individuals. Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.
[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

[d] Upper poverty line for rural Barishal and rural Khulna divisions were used for calculating the estimates in this table (BBS, 2010; BBS 2016)
Notes:
Estimates are sample-weighted; numbers of observations are unweighted.
Disaggregates based on individual household members (i.e., gendered household type, household education, and household hunger) are calculated using de jure household members. The average consumption shortfall of the poor is the average amount below the poverty threshold of a person in poverty. This value is estimated only among individuals living in households that fall below the poverty threshold.
The average consumption shortfall of the poor, expressed as a percentage of the national poverty line, was calculated by first subtracting the per capita monthly consumption expenditure in LCU for the year of the HIES of each poor household in the sample from the upper poverty line in LCU for the year of the HIES. The figure was then divided by the upper poverty line in LCU for the year of the HIES. Finally, after applying the household member sampling weight, the value for each poor household was summed across all poor households and then divided by the sum of the number of all poor sampled households with consumption data.
Source: Household Income and Expenditure Survey (HIES), 2010 and 2016.

Chapter 5: A-WEAI

Table A1.5.1: Comparison of Adequate Achievement in Each A-WEAI Indicator in the Phase One ZOI Using Uncensored Headcount Ratios, by Sex and Age, Feed the Future Phase One Baseline and Endline ZOI Surveys

A-WEAI indicator and characteristic	Baseline (2011/2012)			Endline (2018/2019)				p-value[c]	
	%[a,b]	95% CI	n	%[a,b]	95% CI	N	Diff.		Sig.[d]
Women									
Input in productive decisions	80.3	77.03 – 83.49	1,850	97.7	96.94 – 98.54	1,831	17.4	0.000	***
18-29	73.0	67.28 – 78.64	508	97.7	95.66 – 99.81	323	24.7	0.000	***
30+	82.9	79.73 – 86.14	1,342	97.7	96.89 – 98.59	1,508	14.8	0.000	***
Ownership of assets	70.7	67.40 – 74.08	1,850	97.1	96.00 – 98.24	1,831	26.4	0.000	***
18-29	64.3	59.36 – 69.25	508	95.6	92.56 – 98.68	323	31.3	0.000	***
30+	73.1	69.44 – 76.76	1,342	97.4	96.29 – 98.57	1,508	24.3	0.000	***
Access to and decisions on credit	49.7	45.90 – 53.47	1,850	73.7	70.64 – 76.83	1,831	24.0	0.000	***
18-29	46.0	40.79 – 51.14	508	70.3	64.11 -76.52	323	24.3	0.000	***
30+	51.1	46.96 – 55.14	1,342	74.4	71.18 – 77.70	1,508	23.3	0.000	***
Control over income	74.3	70.42 – 78.12	1,850	95.8	94.65 – 96.89	1,831	21.5	0.000	***
18-29	67.4	61.24 – 73.60	508	97.1	94.79 – 99.32	508	29.7	0.000	***
30+	76.8	72.89 – 80.66	1,342	95.5	94.27 – 96.75	1,342	18.7	0.000	***
Group membership	41.6	37.38 – 45.85	1,850	75.3	72.16 – 78.50	1,831	33.7	0.000	***
18-29	35.5	29.98 – 41.07	508	71.5	65.94 – 77.04	323	36.0	0.000	***
30+	43.9	39.51 – 48.18	1,342	76.1	72.75 – 79.49	1,508	32.2	0.000	***
Workload	73.1	69.78 – 76.41	1,850	85.4	83.07 – 87.74	1,831	12.3	0.000	***
18-29	67.9	62.82 – 72.97	508	80.4	74.89 – 85.80	323	12.5	0.001	**
30+	75.0	71.42 – 78.58	1,342	86.5	83.97 – 88.95	1,508	11.5	0.000	***
Men									
Input in productive decisions	94.5	92.98 – 95.97	1,601	96.5	95.40 – 97.60	1,565	2.0	0.015	*
18-29	85.9	80.15 – 91.72	202	91.4	86.35 – 96.35	138	5.5	0.152	n/s
30+	95.6	94.18 – 96.92	1,399	96.9	95.81 – 97.96	1,427	1.3	0.068	n/s
Ownership of assets	97.7	96.73 – 98.63	1,601	99.2	98.67 – 99.66	1,565	1.5	0.005	**
18-29	95.1	91.49 – 98.65	202	95.4	91.97 – 98.64	138	0.3	0.893	n/s
30+	98.0	96.98 – 99.04	1,399	99.5	99.01 – 99.88	1,427	1.5	0.007	**
Access to and decisions on credit	63.3	59.57 – 67.08	1,601	80.7	78.29 – 83.19	1,565	17.4	0.000	***
18-29	57.8	50.30 – 65.32	202	70.4	61.41 – 79.34	138	12.6	0.037	*
30+	64.0	60.18 – 67.86	1,399	81.5	78.91 – 84.12	1,427	17.5	0.000	***
Control over income	96.6	95.43 – 97.68	1,601	98.1	97.22 – 98.90	1,565	1.5	0.020	*
18-29	95.3	91.68 – 98.85	202	94.8	89.55 – 100.00	138	-0.5	0.884	n/s
30+	96.7	95.55 – 97.88	1,399	98.3	97.55 – 99.05	1,427	1.6	0.022	*
Group membership	42.9	39.47 – 46.39	1,601	67.3	64.46 – 70.06	1,565	24.4	0.000	***
18-29	36.1	28.02 – 44.10	202	60.7	51.72 – 69.58	138	24.6	0.000	***
30+	43.8	40.14 – 47.46	1,399	67.8	64.79 – 70.71	1,427	24.0	0.000	***
Workload	66.5	63.09 – 69.86	1,601	77.4	74.94 – 79.91	1,565	10.9	0.000	***
18-29	65.3	57.06 – 73.46	202	81.6	75.81 – 87.41	138	16.3	0.001	**

30+	66.6	63.10 – 70.17	1,399	77.1	74.44 – 79.77	1,427	10.5	0.000	***

A-WEAI=Abbreviated Women's Empowerment in Agriculture Index; CI=confidence interval; Diff.=difference; n/s=not significant

^ Results not statistically reliable, n<30

[a] Estimates for women exclude households that do not have a primary adult female decision-maker or that have missing or incomplete indicator data.

[b] Estimates for men exclude households that do not have a primary adult male decision-maker or that have missing or incomplete indicator data.

[c] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[d] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on primary adult decision-makers who are de jure household members.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table A1.5.2: Comparison of Participation in Activities, by Sex, Feed the Future Phase One Baseline and Endline ZOI Surveys

Activity	Participated in activity						
	Baseline (2011/2012)		Endline (2018/2019)		Diff.	p-value[a]	Sig.[b]
	%	95% CI	%	95% CI			
Women[c]							
Sleeping and resting	100.0	n/a	100.0	n/a	n/a	n/a	n/a
Eating and drinking	100.0	n/a	99.9	99.7 – 100.0	-0.1	0.09	n/s
Personal care[†]	95.6	93.7 – 97.6	100.0	n/a	4.4	0.000	***
School and homework[d]	4.9	3.4 – 6.5	2.6	1.5 – 3.8	-2.3	0.019	*
Work as employed[d]	3.6	2.7 – 4.6	3.3	2.3 – 4.2	-0.3	0.526	n/s
Own business work[d]	2.1	1.2 – 3.0	4.9	3.8 – 6.0	2.8	0.000	***
Farming, livestock, fishing[d]	4.5	2.8 – 6.1	69.3	65.6 – 72.9	64.8	0.000	***
Shopping, getting services[d]	1.2	0.6 – 4.2	5.5	4.2 – 6.8	4.3	0.000	***
Weaving, sewing, textile care[d]	10.1	8.0 – 12.1	9.1	7.4 – 10.7	-1.0	0.431	n/s
Cooking[d]	93.0	91.4 – 94.5	88.3	86.4 – 90.1	-4.7	0.000	***
Domestic work (fetching food and water)[d]	98.4	97.7 – 99.1	97.4	96.6 – 98.1	-1.0	0.044	*
Care for children, adults, elderly[d]	45.5	41.9 – 49.1	57.8	54.5 – 61.1	12.3	0.000	***
Commuting (for work or school) [d]	10.5	8.8 – 12.3	—	—	—	—	—
Travel (not for work or school)	7.4	5.4 – 9.5	28.0	25.2 – 30.8	20.6	0.000	***
Watching TV, listening to radio, reading	11.5	9.1 – 13.9	29.9	26.0 – 33.8	18.3	0.000	***
Exercising	2.7	1.8 – 3.5	5.2	3.8 – 6.5	2.5	0.003	**
Social activities and hobbies	19.1	15.7 – 22.6	83.7	81.1 – 86.3	64.6	0.000	***
Religious activities	53.9	49.9 – 57.9	59.2	56.0 – 62.4	5.3	0.005	**
Other	2.6	1.6 – 3.6	0.8	0.4 – 1.2	-1.8	0.001	**
Number of women	2,039		2,051				
Men[e]							
Sleeping and resting	100.0	n/a	99.9	99.8 – 100.1	-0.1	0.321	n/s
Eating and drinking	99.7	99.4 – 100.1	99.6	99.1 – 100.1	-0.1	0.760	n/s
Personal care	96.9	95.3 – 98.6	99.9	99.8 – 100.0	3.0	0.001	**
School and homework[d]	4.3	3.2 – 5.3	4.0	3.0 – 5.1	-0.3	0.718	n/s
Work as employed[d]	23.5	20.9 – 26.1	23.8	21.0 – 26.6	0.3	0.838	n/s
Own business work[d]	31.1	27.7 – 34.4	30.1	26.8 – 33.4	-1.0	0.534	n/s
Farming, livestock, fishing[d]	34.0	30.5 – 37.5	52.2	48.1 – 56.2	18.2	0.000	***
Shopping, getting services[d]	20.8	17.8 – 23.9	25.2	28.2 – 29.5	4.4	0.039	*
Weaving, sewing, textile care[d]	1.5	0.8 – 2.2	0.5	0.2 – 0.8	-1.0	0.011	n/s
Cooking[d]	1.5	0.9 – 2.2	0.7	0.3 – 1.2	-0.8	0.045	*
Domestic work (fetching food and water) [d]	50.7	46.6 – 54.8	21.2	18.4 – 23.9	-29.5	0.000	***
Care for children, adults, elderly[d]	11.6	9.6 – 13.5	12.1	10.3 – 14.0	0.6	0.651	n/s
Commuting (for work or school) [d]	28.3	24.4 – 32.2	—	—	—	—	—
Travel (not for work or school)	6.9	5.2 – 8.6	70.0	65.2 – 74.8	63.1	0.000	***
Watching TV, listening to radio, reading	19.9	17.1 – 22.7	27.6	24.4 – 30.9	7.7	0.000	***
Exercising	5.2	4.0 – 6.4	7.1	5.6 – 8.6	1.9	0.053	n/s

Activity	Participated in activity						
	Baseline (2011/2012)		Endline (2018/2019)		Diff.	p-value[a]	Sig.[b]
	%	95% CI	%	95% CI			
Social activities and hobbies	30.9	26.9 – 34.9	74.1	70.8 – 77.4	43.2	0.000	***
Religious activities	38.5	34.3 – 42.7	43.8	39.7 – 48.0	5.3	0.005	**
Other	3.8	2.7 – 4.9	1.8	1.1 – 2.5	-2.0	0.002	**
Number of men	1,726		1,755				

CI=confidence interval; Diff.=difference; n/a=not applicable; n/s=not significant
^ Results not statistically reliable, n<30

—— = Data are not available as these data were not collected.
† The 95% CIs are reported as 'n/a' because the baseline and endline estimates are 100.0; therefore, a 95% CI cannot be generated.
[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.
[c] Estimates for women exclude households that do not have a primary adult female decision-maker or that have missing or incomplete indicator data.
[d] Activities considered to be work in the A-WEAI calculations.
[e] Estimates for men exclude households that do not have a primary adult male decision-maker or that have missing or incomplete indicator data.
[f] WEAI questionnaire was updated at endline to combine the activity categories of "commute (for work or school)" and "travel (not for work or school)" at baseline into a single category of "travel" at endline. This caused the share of performed activity and mean hours of travel time to increase dramatically at endline compared to baseline.
Notes:
Estimates are sample-weighted; numbers of observations are unweighted.
Estimates are based on primary adult decision-makers who are de jure household members.
Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table A1.5.3: Comparison of Mean Hours Devoted to Activities, by Sex, Feed the Future Phase One Baseline and Endline ZOI Surveys

	Mean hours devoted (hours:minutes)						
	Baseline (2011/2012)		Endline (2018/2019)			p-value[a]	Sig.[b]
Activity	Est.	95% CI	Est.	95% CI	Diff.		
Women[c]							
Sleeping and resting	9:03	8:57 – 9:09	9:08	8:59 – 9:15	0:05	0.413	n/s
Eating and drinking	1:55	1:51 – 1:59	1:17	1:14 – 1:19	-0:38	0.000	***
Personal care	1:22	1:17 – 1:27	1:25	1:22 – 1:27	0:03	0.312	n/s
School and homework[d]	0:05	0:03 – 0:06	0:02	0:00 – 0:02	-0:03	0.000	***
Work as employed[d]	0:12	0:09 – 0:15	0:11	0:07 – 0:14	-0:01	0.398	n/s
Own business work[d]	0:05	0:02 – 0:07	0:08	0:05 – 0:10	0:03	0.106	n/s
Farming, livestock, fishing[d]	0:08	0:04 – 0:12	1:26	1:15 – 1:36	1:17	0.000	***
Shopping, getting services[d]	0:01	0.00 – 0.01	0:03	0:02 – 0:04	0.02	0.000	***
Weaving, sewing, textile care[d]	0:16	0:11 – 0:19	0:13	0:10 – 0:16	-0:03	0.311	n/s
Cooking[d]	2:42	2:35 – 2:49	2:03	1:58 – 2:08	-0:39	0.000	***
Domestic work (fetching food and water) [d]	4:42	4:32 – 4:52	3:08	3:01 – 3:15	-1:26	0.000	***
Care for children, adults, elderly[d]	0:56	0:50 – 1:02	1:14	1:07 – 1:20	0:18	0.000	***
Commuting (for work or school) [d]	0:11	0:08 – 0:13	—	—	—	—	—
Travel (not for work or school)	0:09	0:05 – 0:12	0:21	0:18 – 0:24	0:12	0.000	***
Watching TV, listening to radio, reading	0:13	0:09 – 0:15	0:34	0:28 – 0:38	0:21	0.000	***
Exercising	0:02	0:01 – 0:02	0:03	0:02 – 0:04	0:01	0.003	**
Social activities and hobbies	0:19	0:10 – 0:17	2:01	1:52 – 2:08	1:42	0.000	***
Religious activities	0:37	0:32 – 0:41	1:05	0:58 – 1:11	0:28	0.000	***
Other	0:03	0:01 – 0:04	0:01	0:00 – 0:01	-0:02	0.009	**
Number of women	2,039		2,051				
Men[e]							
Sleeping and resting	9:00	8:53 – 9:06	9:22	9:12 – 9:30	0:22	0.000	***
Eating and drinking	1:35	1:30 – 1:38	1:19	1:15 – 1:21	-0:16	0.000	***
Personal care	1:26	1:20 – 1:31	1:13	1:10 – 1:16	-0:13	0.000	***
School and homework[d]	0:03	0:02 – 0:04	0:05	0:02 – 0:06	0:02	0.102	n/s
Work as employed[d]	1:42	1:30 – 1:54	1:50	1:36 – 2:04	0:08	0.296	n/s
Own business work[d]	2:24	2:06 – 2:42	2:24	2:06 – 2:42	0:00	0.976	n/s
Farming, livestock, fishing[d]	1:47	1:31 – 2:01	2:31	2:13 – 2:48	0:44	0.000	***
Shopping, getting services[d]	0:28	0:22 – 0:33	0:24	0:20 – 0:28	-0:04	0.323	n/s
Weaving, sewing, textile care[d]	0:02	0:00 – 0.03	0:01	0:00 – 0.02	0:01	0.277	n/s
Cooking[d]	0:02	0:00 – 0.03	0:00	n/a	0:01	0.017	*
Domestic work (fetching food and water) [d]	1:36	1:24 – 1:47	0:25	0:21 – 0:29	-1:11	0.000	***
Care for children, adults, elderly[d]	0:12	0:09 – 0:15	0:07	0:05 – 0:08	-0:05	0.003	**
Commuting (for work or school) [d]	0:31	0:25 – 0:35	—	—	—	—	—
Travel (not for work or school)	0:11	0:07 – 0:14	1:02	0:56 – 1:07	0:51	0.000	***
Watching TV, listening to radio, reading	0:28	0:22 – 0:33	0:29	0:25 – 0:33	0:01	0.664	n/s
Exercising	0:04	0:03 – 0:05	0:06	0:04 – 0:07	0:2	0.173	n/s
Social activities and hobbies	0:46	0:31 – 0:43	2:17	2:06 – 2:27	1:31	0.000	***
Religious activities	0:29	0:24 – 0:24	0:46	0:40 – 0:51	0:17	0.000	***
Other	0:07	0:04 – 0:08	0:02	0:00 – 0:03	-0:05	0.001	**

Activity	Mean hours devoted (hours:minutes)						
	Baseline (2011/2012)		Endline (2018/2019)				
	Est.	95% CI	Est.	95% CI	Diff.	p-value[a]	Sig.[b]
Number of men	1,726		1,755				

CI=confidence interval; Est.=estimate; n/a= not applicable
^ Results not statistically reliable, n<30
— = Data are not available as these data were not collected.
[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n.s.
[c] Estimates for women exclude households that do not have a primary adult female decision-maker or that have missing or incomplete indicator data.
[d] Activities considered to be work in the A-WEAI calculations
[e] Estimates for men exclude households that do not have a primary adult male decision-maker or that have missing or incomplete indicator data.
[f] WEAI questionnaire was updated at endline to combine the activity categories of "commute (for work or school)" and "travel (not for work or school)" at baseline into a single category of "travel" at endline. This caused the share of performed activity and mean hours of travel time to increase dramatically at endline compared to baseline.
Notes:
Estimates are sample-weighted; numbers of observations are unweighted.
Estimates are based on primary adult decision-makers who are de jure household members.
Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Chapter 6: Household hunger and dietary intake

Table A1.6.1.1: Comparison of Moderate to Severe Household Hunger in the Phase One ZOI, in Total and by Selected Household Characteristics, Feed the Future Phase One Baseline and Endline ZOI Surveys

	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[b]	Sig.[c]
Characteristic	**%**	**95% CI**	**n[a]**	**%**	**95% CI**	**n[a]**			
All households	7.9	6.4 – 9.4	2,040	2.5	1.7 – 3.3	2,064	-5.4	0.000	***
Gendered household type									
Male and female adults	7.1	5.7 – 8.6	1,751	2.1	1.3 – 2.8	1,738	-5.0	0.000	***
Female adults only	12.9	8.4 – 17.5	283	4.5	2.3 – 6.7	313	-8.5	0.001	***
Male adults only	^	^	6	^	^	12	^	^	^
Children only	^	^	0	^	^	1	^	^	^
Household education									
No education	20.0	13.3 – 26.6	137	11.7	4.7 – 18.7	121	-8.3	0.091	n/s
Less than primary	15.8	11.7 – 19.9	376	4.2	1.4 – 7.0	204	-11.6	0.000	***
Completed primary	5.2	3.7 – 6.7	1,084	2.4	1.4 – 3.4	1,088	-2.8	0.002	**
Completed secondary	4.3	1.9 – 6.7	231	0.5	0.0 – 1.1	321	-3.8	0.003	**
Higher	3.8	0.9 – 6.7	212	0.3	0.0 – 0.8	330	-3.5	0.019	*
Poverty status									
Poor	15.0	11.9 – 18.2	758	6.6	4.3 – 8.9	444	-8.4	0.000	***
Non-poor	3.7	2.6 – 4.7	1,282	1.4	0.8 – 2.0	1,620	-2.3	0.000	***

CI=confidence interval; Diff.=difference

^ Results not statistically reliable, n<30

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated by n/s.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members (i.e., gendered household type, household education, and poverty status) are calculated using de jure household members.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table A1.6.1.2: Comparison of Severe Household Hunger in the Phase One ZOI, in Total and by Selected Household Characteristics, Feed the Future Phase One Baseline and Endline ZOI Surveys

Characteristic	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[b]	Sig.[c]
	%	95% CI	n[a]	%	95% CI	n[a]			
All households	1.0	0.5 – 1.4	2,040	0.3	0.1 – 0.6	2,064	-0.7	0.013	*
Gendered household type									
Male and female adults	0.8	0.4 – 1.3	1,751	0.2	0.0 – 0.4	1,738	-0.6	0.011	*
Female adults only	1.7	0.2 – 3.2	283	1.0	0.0 – 2.1	313	-0.7	0.439	n/s
Male adults only	^	^	6	^	^	12	^	^	^
Children only	^	^	0	^	^	1	^	^	^
Household education									
No education	2.1	0.0 – 4.4	137	2.6	0.0 – 5.5	121	0.5	0.791	n/s
Less than primary†	1.5	0.2 – 2.8	376	0.0	n/a	204	-1.5	0.027	*
Completed primary	0.8	0.3 – 1.3	1,084	0.3	0.0 – 0.7	1,088	-0.5	0.114	n/s
Completed secondary†,*	0.0	n/a	231	0.0	n/a	321	n/a	n/a	n/a
Higher†	0.9	0.0 – 2.2	212	0.0	n/a	330	-0.9	0.164	n/s
Poverty status									
Poor	2.3	1.2 – 3.4	758	0.8	0.0 – 1.6	444	-1.5	0.031	*
Non-poor	0.2	0.0 – 0.4	1,282	0.2	0.0 – 0.4	1,620	0.0	0.782	n/s

CI=confidence interval; Diff.=difference; n/a=not applicable

^ Results not statistically reliable, n<30

† Select 95% CIs have been reported as 'n/a' when estimates are 0.0; therefore, a 95% CI cannot be generated.

*As select estimates are not presented because the results are not statistically reliable, the difference, p-value, and significance could not be calculated; thus, these data are not applicable.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated by n/s.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members (i.e., gendered household type, household education, and poverty status) are calculated using de jure household members.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table A1.6.1.3: Comparison of Moderate Household Hunger in the Phase One ZOI, in Total and by Selected Household Characteristics, Feed the Future Phase One Baseline and Endline ZOI Surveys

Characteristic	Baseline (2011/2012)			Endline (2018/2019)			Diff.	p-value[b]	Sig.[c]
	%	95% CI	n[a]	%	95% CI	n[a]			
All households	7.0	5.7 – 8.3	2,040	2.2	1.4 – 2.9	2,064	-4.8	0.000	***
Gendered household type									
Male and female adults	6.3	5.0 – 7.7	1,751	1.9	1.2 – 2.6	1,738	-4.4	0.000	***
Female adults only	11.2	7.1 – 15.4	283	3.5	1.5 – 5.5	313	-7.7	0.001	***
Male adults only	^	^	6	^	^	12	^	^	^
Children only	^	^	0	^	^	1	^	^	^
Household education									
No education	17.9	11.9 – 23.9	137	9.1	2.5 – 15.8	121	-8.8	0.055	n/s
Less than primary	14.3	10.5 – 18.1	376	4.2	1.4 – 7.0	204	-10.1	0.000	***
Completed primary	4.4	3.0 – 5.8	1,084	2.1	1.2 – 3.1	1,088	-2.3	0.007	**
Completed secondary	4.3	1.9 – 6.7	231	0.5	0.0 – 1.1	321	-3.8	0.003	**
Higher	2.9	0.7 – 5.1	212	0.3	0.0 – 0.8	330	-2.6	0.025	*
Poverty status									
Poor	12.8	9.9 – 15.6	758	5.9	3.7 – 8.1	444	-6.9	0.000	***
Non-poor	3.5	2.5 – 4.6	1,282	1.2	0.6 – 1.7	1,620	-2.3	0.000	***

CI=confidence interval; Diff.=difference; n/s=not significant

^ Results not statistically reliable, n<30

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated by n/s.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members (i.e., gendered household type, household education, and poverty status) are calculated using de jure household members.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table A1.6.1.4: Comparison of Little to No Household Hunger in the Phase One ZOI, in Total and by Selected Household Characteristics, Feed the Future Phase One Baseline and Endline ZOI Surveys

	Baseline (2011/2012)			Endline (2018/2019)					
Characteristic	%	95% CI	n[a]	%	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
All households	92.1	90.6 – 93.6	2,040	97.5	96.7 – 98.2	2,064	5.4	0.000	***
Gendered household type									
Male and female adults	92.9	91.4 – 94.3	1,751	97.9	97.2 – 98.7	1,738	5.0	0.000	***
Female adults only	87.1	82.5 – 91.6	283	95.5	93.3 – 97.7	313	8.5	0.001	***
Male adults only	^	^	6	^	^	12	^	^	^
Children only	^	^	0	^	^	1	^	^	^
Household education									
No education	80.0	73.4 – 86.7	137	88.3	81.3 – 95.3	121	8.3	0.091	n/s
Less than primary	84.2	80.1 – 88.3	376	95.8	93.0 – 98.6	204	11.6	0.000	***
Completed primary	94.8	93.3 – 96.3	1,084	97.6	96.6 – 98.6	1,088	2.8	0.002	**
Completed secondary	95.7	93.3 – 98.1	231	99.5	98.9 – 100.1	321	3.8	0.003	**
Higher	96.2	93.3 – 99.1	212	99.7	99.2 – 100.3	330	3.5	0.019	*
Poverty status									
Poor	85.0	81.8 – 88.1	758	93.4	91.1 – 95.7	444	8.4	0.000	***
Non-poor	96.3	95.3 – 97.4	1,282	98.6	98.1 – 99.2	1,620	2.3	0.000	***

CI=confidence interval; Diff.=difference; n=number

^ Results not statistically reliable, n<30

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated by n/s.

Notes:

Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members (i.e., gendered household type, household education, and poverty status) are calculated using de jure household members.

Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Table A1.6.2.1: Comparison of Percent of All Children 6-23 Months of Age Achieving Minimum Feeding Frequency, Dietary Diversity, and Consuming Specified Foods in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Breastfeeding Status, Bangladesh Demographic and Health Surveys (BDHS)

Breastfeeding status and food group consumed	Baseline (2011)		Endline (2017/2018)		Diff.	p-value [a]	Sig.[b]
	%	95% CI	%	95% CI			
All children 6-23 months of age							
Achieving minimum meal frequency	73.6	68.2 – 79.0	82.8	79.3 – 86.3	9.3	0.005	**
Achieving minimum dietary diversity	28.2	23.9 – 32.4	36.8	32.8 – 40.8	8.6	0.006	**
Consuming:							
Breastmilk	95.7	93.8 – 97.6	97	95.5 – 98.5	1.3	0.295	n/s
Grains, roots, and tubers	82.3	77.9 – 86.7	90.7	87.8 – 93.6	8.4	0.002	**
Legumes and nuts	10.9	7.3 – 14.5	17.9	14.3 – 21.6	7.1	0.006	**
Dairy products	27.1	22.5 – 31.6	30.6	26.4 – 34.9	3.6	0.278	n/s
Flesh foods	50.8	45.7 – 56.0	55.1	50.6 – 59.5	4.2	0.227	n/s
Eggs	28.0	23.5 – 32.5	47.3	42.6 – 52.0	19.3	0.000	***
Vitamin A-rich fruits and vegetables	37.7	33.0 – 42.4	37.5	32.7 – 42.4	-0.1	0.968	n/s
Other fruits and vegetables	18.9	14.8 – 23.1	26.0	21.4 – 30.6	7.1	0.030	*
Number of children	533		537				
Breastfed children							
Achieving minimum meal frequency	73.6	68.2 – 79.1	83.8	80.3 – 87.2	10.1	0.002	**
Achieving minimum dietary diversity	28.0	23.7 – 32.3	37.5	33.4 – 41.6	9.5	0.003	**
Consuming:							
Breastmilk†	100.0	n/a	100.0	n/a	n/a	n/a	n/a
Grains, roots, and tubers	81.6	77.0 – 86.2	90.4	87.4 – 93.4	8.8	0.002	**
Legumes and nuts	10.4	6.9 – 13.9	17.8	14.1 – 21.4	7.3	0 004	**
Dairy products	25.0	20.5 – 29.6	29.6	25.4 – 33.7	4.5	0.160	n/s
Flesh foods	50.7	45.5 – 55.9	54.4	49.9 – 58.9	3.7	0.288	n/s
Eggs	27.3	22.9 – 31.7	47.4	42.6 – 52.2	20.1	0.000	***
Vitamin A-rich fruits and vegetables	37.5	32.7 – 42.2	37.9	33.0 – 42.8	0.4	0.907	n/s
Other fruits and vegetables	18.8	14.6 – 23.0	25.7	20.9 – 30.4	6.9	0.039	*
Number of breastfed children	506		517				
Non-breastfed children							
Achieving minimum meal frequency	^	^	^	^	^	^	^
Achieving minimum milk feeding frequency	^	^	^	^	^	^	^
Achieving minimum dietary diversity	^	^	^	^	^	^	^
Consuming:							
Grains, roots, and tubers	^	^	^	^	^	^	^
Legumes and nuts	^	^	^	^	^	^	^
Dairy products	^	^	^	^	^	^	^
Flesh foods	^	^	^	^	^	^	^
Eggs	^	^	^	^	^	^	^
Vitamin A-rich fruits and vegetables	^	^	^	^	^	^	^
Other fruits and vegetables	^	^	^	^	^	^	^
Number of non-breastfed children	27		20				

n/a=not applicable; n/s=not significant

^ Results not statistically reliable, n<30

† Select 95% CIs have been reported as 'n/a' when estimates are 100.0; therefore, a 95% CI cannot be generated.

[a] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[b] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Disaggregates based on individual household members are calculated using de jure household members.

Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Chapter 7: Nutritional status

Table A1.7.1.1: Comparison of Mean Body Mass Index among Women of Reproductive Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Woman and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

Characteristic	Baseline (2011) Est.	Baseline (2011) 95% CI	Baseline (2011) n[a]	Endline (2017/2018) Est.	Endline (2017/2018) 95% CI	Endline (2017/2018) n[a]	Diff.	p-value [b]	Sig. [c]
All non-pregnant women of reproductive age	21.4	21.2 – 21.6	4,327	23.4	23.2 – 23.6	4627	1.9	0.000	***
Woman's age									
15-19	19.7	19.4 – 19.9	446	21.1	20.7 – 21.4	427	1.4	0.000	***
20-24	20.7	20.4 – 21.0	766	22.4	22.0 – 22.7	716	1.6	0.000	***
25-29	21.8	21.4 – 22.1	770	23.6	23.2 – 24.0	727	1.8	0.000	***
30-34	22.0	21.6 – 22.5	658	24.0	23.5 – 24.4	793	1.9	0.000	***
35-39	21.8	21.5 – 22.2	622	24.0	23.7 – 24.4	738	2.2	0.000	***
40-44	22.0	21.6 – 22.4	577	23.9	23.5 – 24.3	621	1.9	0.000	***
45-49	21.8	21.4 – 22.2	488	24.0	23.6 – 24.4	605	2.2	0.000	***
Woman's education									
No education	21.3	21.0 – 21.5	847	23.0	22.5 – 23.4	533	1.7	0.000	***
Less than primary	21.0	20.7 – 21.3	867	23.2	22.9 – 23.5	1,010	2.2	0.000	***
Completed primary	21.4	21.1 – 21.7	2024	23.4	23.1 – 23.6	2,179	2	0.000	***
Completed secondary	22.8	22.2 – 23.3	216	24.1	23.5 – 24.8	217	1.4	0.001	**
Higher	23.0	22.5 – 23.5	373	24.0	23.5 – 24.5	688	1.0	0.005	**
Gendered household type									
Male and female adults	21.4	21.2 – 21.7	4,060	23.4	23.2 – 23.6	4,204	2	0.000	***
Female adults only	21.6	21.0 – 22.1	243	23.3	22.8 – 23.8	414	1.7	0.000	***
Male adults only	^	^	24	^	^	9	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

Est.=estimate; n/a=not applicable.
^ Results not statistically reliable, n<30
— = Data are not available as these data were not collected.
[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.
[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.
Notes:
BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.
Estimates are sample-weighted; numbers of observations are unweighted.
Estimates are based on de facto household members.
Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table A1.7.1.2: Comparison of Prevalence of Underweight Women of Reproductive Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Woman and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

	Baseline (2011)			Endline (2017/2018)					
Characteristic	Est.	95% CI	n[a]	Est.	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
All non-pregnant women of reproductive age	22.2	20.3 – 24.1	4,327	11.0	9.6 – 12.3	4,627	-11.3	0.000	***
Woman's age									
15-19	34.6	30.2 – 39.0	446	21.9	17.2 – 26.5	427	-12.7	0.000	***
20-24	26.3	22.3 – 30.3	766	15.7	12.6 – 18.9	716	-10.6	0.000	***
25-29	18.5	15.4 – 21.6	770	9.6	7.1 – 12.2	727	-8.9	0.000	***
30-34	18.9	15.1 – 22.6	658	6.9	5.0 – 8.9	793	-11.9	0.000	***
35-39	16.9	13.7 – 20.2	622	7.2	5.0 – 9.4	738	-9.8	0.000	***
40-44	21.0	17.2 – 24.8	577	10.4	6.2 – 14.5	621	-10.6	0.000	***
45-49	22.4	18.0 – 26.9	488	9.2	6.8 – 11.7	605	-13.2	0.000	***
Woman's education									
No education	23.3	19.7 – 26.8	847	12.3	7.9 – 16.7	533	-11	0.000	***
Less than primary	25.5	21.8 – 29.2	867	11.7	9.7 – 13.8	1,010	-13.8	0.000	***
Completed primary	22.7	19.8 – 25.7	2,024	11	9.3 – 12.7	2,179	-11.7	0.000	***
Completed secondary	12.5	7.4 – 17.6	216	5.7	2.4 – 9.0	217	-6.8	0.025	*
Higher	10.8	6.6 – 14.9	373	9.8	6.5 – 13.2	688	-0.9	0.728	n/s
Gendered household type									
Male and female adults	22.1	20.1 – 24.1	4,060	11.0	9.7 – 12.4	4,204	-11.1	0.000	***
Female adults only	21.9	15.1 – 28.6	243	10.2	6.6 – 13.8	414	-11.7	0.003	**
Male adults only	^	^	24	^	^	9	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

Est.=estimate; n/a=not applicable.
^ Results not statistically reliable, n<30
— = Data are not available as these data were not collected.
[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.
[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.
Notes:
BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.
Estimates are sample-weighted; numbers of observations are unweighted.
Estimates are based on de facto household members.
Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table A1.7.1.3: Comparison of Prevalence of Normal Weight Women of Reproductive Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Woman and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

	Baseline (2011)			Endline (2017/2018)					
Characteristic	Est.	95% CI	n[a]	Est.	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
All non-pregnant women of reproductive age	61.8	59.7 – 63.9	4,327	56.4	54.5 – 58.4	4,627	-5.4	0.001	**
Woman's age									
15-19	62.5	58.1 – 66.9	446	66.4	60.8 – 71.9	427	3.9	0.281	n/s
20-24	62.9	58.6 – 67.1	766	61.4	57.5 – 65.3	716	-1.5	0.621	n/s
25-29	63.8	59.6 – 68.1	770	56.9	52.3 – 61.5	727	-6.9	0.030	*
30-34	60.4	56.1 – 64.7	658	54.4	49.7 – 59.1	793	-6.0	0.058	n/s
35-39	64.9	60.8 – 69.1	622	54.1	50.1 – 58.1	738	-10.8	0.000	***
40-44	58.3	53.6 – 63.0	577	50.6	45.9 – 55.3	621	-7.7	0.023	*
45-49	58.6	53.2 – 64.0	488	53.9	49.1 – 58.8	605	-4.7	0.212	n/s
Woman's education									
No education	62.2	57.6 – 66.8	847	58.1	52.9 – 63.4	533	-4.1	0.249	n/s
Less than primary	62.5	58.3 – 66.6	867	56.8	53.7 – 59.9	1,010	-5.7	0.038	*
Completed primary	61.4	58.4 – 64.3	2,024	56.8	54.1 – 59.4	2,179	-4.6	0.024	*
Completed secondary	61.9	54.2 – 69.6	216	58.8	50.4 – 67.2	217	-3.1	0.621	n/s
Higher	61.4	55.8 – 66.9	373	51.9	47.6 – 56.3	688	-9.4	0.007	**
Gendered household type									
Male and female adults	62.1	60.0 – 64.3	4,060	56.3	54.4 – 58.3	4,204	-5.8	0.000	***
Female adults only	57.6	50.0 – 65.2	243	57.2	50.2 – 64.2	414	-0.4	0.938	n/s
Male adults only	^	^	24	^	^	9	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

Est.=estimate; n/a=not applicable; n/s=not significant

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on de facto household members.

Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table A1.7.1.4: Comparison of Prevalence of Overweight Women of Reproductive Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Woman and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

	Baseline (2011)			Endline (2017/2018)					
Characteristic	Est.	95% CI	n[a]	Est.	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
All non-pregnant women of reproductive age	13.6	11.9 – 15.4	4,327	26.2	24.4 – 27.9	4,627	12.5	0.000	***
Woman's age									
15-19	2.8	0.9 – 4.7	446	10.7	7.4 – 13.9	427	7.9	0.000	***
20-24	9.2	6.7 – 11.7	766	19.3	16.0 – 22.6	716	10.0	0.000	***
25-29	15.4	12.2 – 18.6	770	26.7	22.6 – 30.8	727	11.3	0.000	***
30-34	17.6	13.9 – 21.3	658	30.9	26.6 – 35.2	793	13.3	0.000	***
35-39	14.7	11.4 – 18.0	622	32	28.3 – 35.8	738	17.4	0.000	***
40-44	18.0	14.0 – 22.1	577	31.3	27.5 – 35.2	621	13.3	0.000	***
45-49	16.1	12.2 – 20.0	488	26.7	22.5 – 31.0	605	10.6	0.000	***
Woman's education									
No education	13.4	10.4 – 16.4	847	24.4	20.6 – 28.2	533	11.0	0.000	***
Less than primary	10.3	7.8 – 12.9	867	25.4	22.7 – 28.2	1,010	15.1	0.000	***
Completed primary	13.3	11.3 – 15.4	2,024	26	23.9 – 28.0	2,179	12.7	0.000	***
Completed secondary	20.7	15.3 – 26.1	216	27.2	19.7 – 34.6	217	6.5	0.200	n/s
Higher	22.5	17.6 – 27.3	373	29.7	25.7 – 33.8	688	7.3	0.019	*
Gendered household type									
Male and female adults	13.4	11.6 – 15.1	4,060	26.1	24.3 – 27.9	4,204	12.7	0.000	***
Female adults only	18.4	12.0 – 24.9	243	27.1	21.6 – 32.7	414	8.7	0.044	*
Male adults only	^	^	24	^	^	9	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

Est.=estimate; n/a=not applicable.
^ Results not statistically reliable, n<30
— = Data are not available as these data were not collected.
[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.
[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.
Notes:
BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.
Estimates are sample-weighted; numbers of observations are unweighted.
Estimates are based on de facto household members.
Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table A1.7.1.5: Comparison of Prevalence of Obese Women of Reproductive Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Woman and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

Characteristic	Baseline (2011)			Endline (2017/2018)			Diff.	p-value[b]	Sig.[c]
	Est.	95% CI	n[a]	Est.	95% CI	n[a]			
All non-pregnant women of reproductive age	2.3	1.8 – 2.9	4,327	6.4	5.4 – 7.4	4,627	4.1	0.000	***
Woman's age									
15-19	0.2	0.0– 0.4	446	1.1	0.0 – 2.2	427	1	0.090	n/s
20-24	1.6	0.7 – 2.5	766	3.6	1.9 – 5.3	716	2	0.044	*
25-29	2.3	1.0 – 3.6	770	6.7	4.3 – 9.2	727	4.5	0.001	**
30-34	3.2	1.7 – 4.6	658	7.7	5.2 – 10.3	793	4.6	0.001	**
35-39	3.4	2.0 – 4.8	622	6.7	4.7 – 8.6	738	3.2	0.013	*
40-44	2.6	1.3 – 4.0	577	7.7	5.5 – 9.9	621	5	0.000	***
45-49	2.9	1.3 – 4.4	488	10.1	7.3 – 12.9	605	7.3	0.000	**
Woman's education									
No education	1.1	0.3 – 1.9	847	5.2	3.3 – 7.1	533	4.1	0.000	***
Less than primary	1.7	0.8 – 2.5	867	6.1	4.4 – 7.7	1,010	4.4	0.000	***
Completed primary	2.5	1.7 – 3.4	2,024	6.3	4.9 – 7.6	2,179	3.7	0.000	***
Completed secondary	4.9	2.3 – 7.6	216	8.3	4.3 – 12.3	217	3.4	0.185	n/s
Higher	5.4	3.1 – 7.7	373	8.5	5.9 – 11.1	688	3.1	0.092	n/s
Gendered household type									
Male and female adults	2.4	1.8 – 2.9	4,060	6.5	5.5 – 7.6	4,204	4.2	0.000	***
Female adults only	2.1	0.3 – 4.0	243	5.5	3.1 – 7.9	414	3.4	0.033	*
Male adults only	^	^	24	^	^	9	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

Est.=estimate; n/a=not applicable.
^ Results not statistically reliable, n<30
— = Data are not available as these data were not collected.
[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.
[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.
Notes:
BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.
Estimates are sample-weighted; numbers of observations are unweighted.
Estimates are based on de facto household members.
Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table A1.7.2.1: Comparison of Prevalence of Severe Stunting (<-3 SD) among Children Under 5 Years of Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

	Baseline (2011)			Endline (2017/2018)				p-	
Characteristic	%	95% CI	n[a]	%	95% CI	n[a]	Diff.	value[b]	Sig.[c]
All children under 5 years of age	14.8	12.7 – 16.9	1,797	6.9	5.4 – 8.4	1,769	-7.9	0.000	***
Child's sex									
Male	14.3	11.5 – 17.1	907	6.0	4.3 – 7.7	913	-8.3	0.000	***
Female	15.4	12.2 – 18.5	890	7.9	5.4 – 10.3	856	-7.5	0.000	***
Child's age									
0-11 months	6	3.4 – 8.5	352	6.1	3.5 – 8.6	412	0.1	0.958	n/s
12-23 months	21.4	16.5 – 26.4	338	10.7	6.0 – 15.4	357	-10.7	0.002	**
24-35 months	15.1	10.5 – 19.6	340	7.2	3.9 – 10.5	331	-7.9	0.006	**
36-47 months	17.9	13.3 – 22.4	408	5.9	3.1 – 8.7	306	-12	0.000	***
48-59 months	13.7	8.7 – 18.7	359	4.6	2.4 – 6.9	363	-9.1	0.001	**
Caregiver's education[d]									
No education	17.6	9.0 – 26.3	183	13.8	4.6 – 23.0	70	-3.8	0.550	n/s
Less than primary	18.4	13.3 – 23.6	319	9.3	5.3 – 13.2	267	-9.2	0.005	**
Completed primary	15.2	12.7 – 17.6	1,023	7.3	5.3 – 9.2	990	-7.9	0.000	***
Completed secondary	6.4	0.0 – 13.4	109	5.0	0.2 – 9.9	99	-1.4	0.746	n/s
Higher	3.9	0.7 – 7.1	163	2.4	0.8 – 4.0	343	-1.5	0.412	n/s
Gendered household type									
Male and female adults	14.8	12.5 – 17.0	1,693	7.0	5.5 – 8.5	1,603	-7.8	0.000	***
Female adults only	12.6	5.2 – 19.9	85	5.2	0.7 – 9.6	158	-7.4	0.092	n/s
Male adults only	^	^	19	^	^	8	^	^	^
Children only	^	^	^	^	^	^	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30
n/s=not significant
— = Data are not available as these data were not collected.
[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.
[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.
Notes:
BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.
Estimates are sample-weighted; numbers of observations are unweighted.
Estimates are based on de facto household members.
Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table A1.7.2.2: Comparison of Prevalence of Stunting (<-2 SD) among Children Under 5 Years of Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

	Baseline (2011)			Endline (2017/2018)					
Characteristic	%	95% CI	n[a]	%	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
All children under 5 years of age	38.6	35.8 – 41.5	1,797	27	24.1 – 30.0	1,769	-11.6	0.000	***
Child's sex									
Male	37.6	34.0 – 41.2	907	25.6	22.0 – 29.1	913	-12.1	0.000	***
Female	39.7	35.3 – 44	890	28.6	24.2 – 33.0	856	-11.1	0.000	***
Child's age									
0-11 months	22.2	16.8 – 27.6	352	19.6	15.7 – 23.4	412	-2.6	0.435	n/s
12-23 months	49.9	43.1 – 56.8	338	33	26.4 – 39.6	357	-16.9	0.000	***
24-35 months	37.5	32.0 – 43.0	340	32.2	25.7 – 38.8	331	-5.3	0.223	n/s
36-47 months	48.0	42.9 – 53.1	408	24.7	19.0 – 30.4	306	-23.3	0.000	***
48-59 months	34.5	28.2 – 40.8	359	26.6	20.3 – 32.9	363	-7.9	0.080	n/s
Caregiver's education[d]									
No education	43.5	35.7 – 51.4	183	47.3	33.9 – 60.7	70	3.8	0.632	n/s
Less than primary	39.2	32.9 – 45.4	319	32.8	26.8 – 38.8	267	-6.4	0.145	n/s
Completed primary	40.1	36.5 – 43.7	1,023	28.9	25.0 – 32.9	990	-11.2	0.000	***
Completed secondary	27.4	17.4 – 37.4	109	25.4	17.1 – 33.6	99	-2	0.759	*
Higher	24.4	16.4 – 32.4	163	10.8	6.8 – 14.8	343	-13.5	0.003	**
Gendered household type									
Male and female adults	38.7	35.6 – 41.8	1,693	26.9	23.6 – 30.1	1,603	-11.8	0.000	***
Female adults only	31.3	21.5 – 41.0	85	28.6	19.4 – 37.8	158	-2.7	0.694	n/s
Male adults only	^	^	19	^	^	8	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

n/s=not significant

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on de facto household members.

Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table A1.7.2.3: Comparison of Mean Height-for-Age Z-Scores among Children Under 5 Years of Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

Characteristic	Baseline (2011)			Endline (2017/2018)			Diff.	p-value[b]	Sig.[c]
	Mean	95% CI	n[a]	Mean	95% CI	n[a]			
All children under 5 years of age	-1.6	-1.7 – -1.6	1,797	-1.3	-1.4 – -1.2	1769	0.4	0.000	***
Child's sex									
Male	-1.6	-1.7 – -1.5	907	-1.2	-1.3 – -1.1	913	0.4	0.000	***
Female	-1.7	-1.8 – -1.5	890	-1.4	-1.5 – -1.3	856	0.3	0.000	***
Child's age									
0-11 months	-0.9	-1.1 – -0.7	352	-1	-1.1 – -0.8	412	-0.1	0.635	n/s
12-23 months	-2	-2.2 – -1.8	338	-1.4	-1.6 – -1.2	357	0.6	0.000	***
24-35 months	-1.8	-1.9 – -1.6	340	-1.5	-1.7 – -1.3	331	0.3	0.018	*
36-47 months	-1.9	-2.0 – -1.7	408	-1.3	-1.5 – -1.2	306	0.5	0.000	***
48-59 months	-1.7	-1.8 – -1.5	359	-1.4	-1.5 – -1.2	363	0.3	0.006	**
Caregiver's education[d]									
No education	-1.9	-2.1 – -1.7	183	-1.7	-2.0 – -1.4	70	0.1	0.501	n/s
Less than primary	-1.8	-1.9 – -1.6	319	-1.6	-1.7 – -1.4	267	0.2	0.075	n/s
Completed primary	-1.7	-1.8 – -1.6	1,023	-1.4	-1.4 – -1.3	990	0.3	0.000	***
Completed secondary	-1.1	-1.4 – -0.7	109	-1.2	-1.5 – -1.0	99	-0.1	0.487	n/s
Higher	-1.1	-1.3 – -0.9	163	-0.7	-0.9 – -0.6	343	0.4	0.015	*
Gendered household type									
Male and female adults	-1.6	-1.7 – -1.6	1,693	-1.3	-1.4 – -1.2	1603	0.4	0.000	***
Female adults only	-1.6	-1.9 – -1.3	85	-1.3	-1.5 – -1.1	158	0.3	0.143	n/s
Male adults only	^	^	19	^	^	8	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30
n/s=not significant
— = Data are not available as these data were not collected.
[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.
[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.
Notes:
BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.
Estimates are sample-weighted; numbers of observations are unweighted.
Estimates are based on de facto household members.
Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table A1.7.3.1: Comparison of Prevalence of Severe Wasting among Children Under 5 Years of Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

	Baseline (2011)			Endline (2017/2018)				p-value	Sig.
Characteristic	%	95% CI	n[a]	%	95% CI	n[a]	Diff.	[b]	[c]
All children under 5 years of age	3.0	2.1 – 4.0	1,797	1.5	0.8 – 2.1	1,763	-1.6	0.006	**
Child's sex									
Male	3.0	1.7 – 4.4	907	2	1.1 – 2.9	908	-1	0.227	n/s
Female	3.1	1.8 – 4.3	890	0.9	0.3 – 1.5	855	-2.2	0.002	**
Child's age									
0-11 months	3.4	0.7 – 6.1	352	1.2	0.3 – 2.2	407	-2.1	0.134	n/s
12-23 months	2.5	0.8 – 4.1	338	1.8	0.5 – 3.1	357	-0.6	0.544	n/s
24-35 months	3.9	1.5 – 6.3	340	1.6	0.2 – 2.9	331	-2.3	0.097	n/s
36-47 months	3.7	1.5 – 5.8	408	1.9	0.1 – 3.6	306	-1.8	0.201	n/s
48-59 months	1.7	0.4 – 3.1	359	0.9	0.0 – 2.0	362	-0.8	0.366	n/s
Caregiver's education[d]									
No education	5.2	1.2 – 9.2	183	2.1	0.0 – 4.9	67	-3.1	0.210	n/s
Less than primary	2.6	0.7 – 4.4	319	1.9	0.4 – 3.4	268	-0.6	0.586	n/s
Completed primary	2.4	1.3 – 3.4	1,023	1.6	0.8 – 2.4	987	-0.8	0.248	n/s
Completed secondary	3.7	0.0 – 7.8	109	2.6	0.0 – 5.4	99	-1.1	0.670	n/s
Higher	6.2	0.7 – 11.7	163	0.1	0.0 – 0.4	342	-6.1	0.031	*
Gendered household type									
Male and female adults	2.9	1.9 – 3.8	1,693	1.4	0.8 – 2.0	1,597	-1.5	0.011	*
Female adults only	5.5	0.0 – 11.5	85	2.2	0.0 – 4.8	158	-3.3	0.313	n/s
Male adults only	^	^	19	^	^	8	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on de facto household members.

Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table A1.7.3.2: Comparison of Prevalence of Wasting among Children Under 5 Years of Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

	Baseline (2011)			Endline (2017/2018)				p-value	Sig.
Characteristic	%	95% CI	n[a]	%	95% CI	n[a]	Diff.	[b]	[c]
All children under 5 years of age	14.2	12.1 – 16.2	1,797	7.4	6.0 – 8.8	1,763	-6.8	0.000	***
Child's sex									
Male	14.7	11.5 – 17.9	907	7.8	6.0 – 9.7	908	-6.9	0.000	***
Female	13.7	11.3 – 16.0	890	7.0	4.9 – 9.0	855	-6.7	0.000	***
Child's age									
0-11 months	13.2	8.2 – 18.2	352	7.1	4.2 – 10.0	407	-6.1	0.037	*
12-23 months	11.5	7.5 – 15.6	338	7.5	4.5 – 10.6	357	-4.0	0.119	n/s
24-35 months	14.0	10.0 – 18.1	340	5.6	3.2 – 7.9	331	-8.4	0.000	***
36-47 months	17.0	12.4 – 21.6	408	8.0	4.5 – 11.5	306	-9	0.002	**
48-59 months	14.4	10.2 – 18.7	359	8.8	5.8 – 11.9	362	-5.6	0.035	*
Caregiver's education[d]									
No education	16.6	8.6 – 24.5	183	16	6.1 – 25.9	67	-0.6	0.927	n/s
Less than primary	18.2	13.6 – 22.8	319	8.5	5.0 – 12.1	268	-9.7	0.001	**
Completed primary	13.2	10.7 – 15.7	1,023	7.7	5.8 – 9.7	987	-5.5	0.001	**
Completed secondary	10.6	4.6 – 16.6	109	4.1	0.6 – 7.6	99	-6.4	0.068	n/s
Higher	10.9	4.7 – 17.2	163	4.3	2.1 – 6.5	342	-6.7	0.048	*
Gendered household type									
Male and female adults	14.4	12.2 – 16.6	1,693	7.7	6.3 – 9.1	1,597	-6.7	0.000	***
Female adults only	8.0	1.5 – 14.6	85	4.9	1.4 – 8.4	158	-3.1	0.406	n/s
Male adults only	^	^	19	^	^	8	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on de facto household members.

Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table A1.7.3.3: Comparison of Prevalence of Healthy Weight Children Under 5 Years of Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

	Baseline (2011)			Endline (2017/2018)			Diff.	p-value [b]	Sig. [c]
Characteristic	%	95% CI	n[a]	%	95% CI	n[a]			
All children under 5 years of age	84.8	82.7 – 86.9	1,797	90.1	88.5 – 91.7	1,763	5.4	0.000	***
Child's sex									
Male	83.7	80.6 – 86.9	907	89.1	86.8 – 91.5	908	5.4	0.007	**
Female	85.8	83.5 – 88.2	890	91.2	89.0 – 93.4	855	5.4	0.001	**
Child's age									
0-11 months	83.9	78.4 – 89.4	352	89.4	85.8 – 92.9	407	5.5	0.101	n/s
12-23 months	87.6	83.5 – 91.7	338	89.7	86.2 – 93.2	357	2.1	0.450	n/s
24-35 months	85.8	81.7 – 89.8	340	91.0	87.9 – 94.2	331	5.3	0.045	*
36-47 months	82.2	77.6 – 86.9	408	91.5	88.0 – 95.0	306	9.2	0.002	**
48-59 months	85.0	80.7 – 89.3	359	89.4	85.8 – 93.0	362	4.4	0.119	n/s
Caregiver's education[d]									
No education	83.4	75.5 – 91.4	183	84.0	74.1 – 93.9	67	0.6	0.927	n/s
Less than primary	81.6	77.0 – 86.2	319	89.6	85.6 – 93.6	268	8.0	0.100	n/s
Completed primary	85.6	83.0 – 88.2	1,023	90.6	88.6 – 92.6	987	5.0	0.003	**
Completed secondary	87.5	81.0 – 94.1	109	92.4	87.5 – 97.3	99	4.8	0.243	n/s
Higher	86.1	79.3 – 92.9	163	89.7	86.1 – 93.4	342	3.6	0.354	n/s
Gendered household type									
Male and female adults	84.5	82.3 – 86.8	1,693	89.6	88.0 – 91.2	1,597	5.1	0.000	***
Female adults only	91.1	84.4 – 97.8	85	94.2	90.5 – 98.0	158	3.1	0.423	n/s
Male adults only	^	^	19	^	^	8	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on de facto household members.

Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table A1.7.3.4: Comparison of Prevalence of Overweight Children Under 5 Years of Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

	Baseline (2011)			Endline (2017/2018)				p-value	Sig.
Characteristic	%	95% CI	n[a]	%	95% CI	n[a]	Diff.	[b]	[c]
All children under 5 years of age	1.0	0.5 – 1.5	1,797	2.5	1.4 – 3.5	1,763	1.4	0.016	*
Child's sex									
Male	1.6	0.7 – 2.5	907	3.1	1.4 – 4.7	908	1.5	0.119	n/s
Female	0.5	0.1 – 0.9	890	1.8	0.8 – 2.8	855	1.3	0.016	*
Child's age									
0-11 months	2.9	0.7 – 5.0	352	3.5	1.0 – 6.0	407	0.6	0.700	n/s
12-23 months	0.8	0.0 – 1.7	338	2.8	0.8 – 4.8	357	1.9	0.079	n/s
24-35 months	0.2	0.0 – 0.5	340	3.4	1.0 – 5.8	331	3.2	0.010	*
36-47 months	0.8	0.0 – 1.6	408	0.5	0.0 – 1.4	306	-0.3	0.659	n/s
48-59 months	0.6	0.0 – 1.2	359	1.7	0.3 – 3.2	362	1.2	0.154	n/s
Caregiver's education[d]									
No education	0.0	n/a	183	0.0	n/a	67	0.0	n/a	n/a
Less than primary	0.2	0.0 – 0.7	319	1.9	0.0 – 3.8	268	1.6	0.094	n/s
Completed primary	1.2	0.5 – 1.8	1,023	1.7	0.8 – 2.5	987	0.5	0.385	n/s
Completed secondary	1.9	0.0 – 5.0	109	3.5	0.1 – 6.9	99	1.6	0.493	n/s
Higher	3.0	0.0 – 5.9	163	6	2.7 – 9.3	342	3.0	0.176	n/s
Gendered household type									
Male and female adults	1.1	0.5 – 1.6	1,693	2.6	1.5 – 3.8	1,597	1.6	0.013	*
Female adults only	0.9	0.0 – 2.6	85	0.9	0.0 – 2.2	158	0.0	0.993	n/s
Male adults only	^	^	19	^	^	8	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30
n/a=not applicable; n/s=not significant.
— = Data are not available as these data were not collected.
[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.
[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated as n/s.
Notes:
BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.
Estimates are sample-weighted; numbers of observations are unweighted.
Estimates are based on de facto household members.
Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table A1.7.3.5: Comparison of Prevalence of Obese Children Under 5 Years of Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

Characteristic	Baseline (2011)			Endline (2017/2018)			Diff.	p-value[b]	Sig.[c]
	%	95% CI	n[a]	%	95% CI	n[a]			
All children under 5 years of age	0.4	0.1 – 0.8	1,797	0.7	0.3 – 1.0	1,763	0.2	0.393	n/s
Child's sex									
Male	0.7	0.1 – 1.3	907	0.6	0.0 – 1.2	908	-0.1	0.798	n/s
Female	0.1	0.0 – 0.3	890	0.7	0.1 – 1.2	855	0.6	0.064	n/s
Child's age									
0-11 months	1.2	0.0 – 2.5	352	1.6	0.4 – 2.9	407	0.4	0.649	n/s
12-23 months	0.5	0.0 – 1.2	338	0.5	0.0 – 1.3	357	0.0	0.928	n/s
24-35 months	0.1	0.0 – 0.4	340	0.9	0.0 – 2.1	331	0.8	0.205	n/s
36-47 months	0.2	0.0 – 0.6	408	0.0	n/a	306	-0.2	0.320	n/s
48-59 months	0.2	0.0 – 0.7	359	0.0	n/a	362	-0.2	0.318	n/s
Caregiver's education[d]									
No education	0.0	n/a	183	0.0	n/a	67	0.0	n/a	n/a
Less than primary	0.0	n/a	319	0.3	0.0 – 0.8	268	0.3	0.317	n/s
Completed primary	0.5	0.1 – 1.0	1,023	0.7	0.2 – 1.2	987	0.1	0.701	n/s
Completed secondary	0.0	n/a	109	0.6	0.0 – 1.5	99	0.6	n/a	n/a
Higher	1.8	0.0 – 4.4	163	1.1	0.0 – 2.6	342	-0.6	0.667	n/s
Gendered household type									
Male and female adults	0.5	0.1 – 0.8	1,693	0.7	0.3 – 1.2	1,597	0.3	0.347	n/s
Female adults only	0.0	n/a	85	0.0	n/a	158	0.0	n/a	n/a
Male adults only	^	^	19	^	^	8	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30
n/a=not applicable.
— = Data are not available as these data were not collected.
[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.
[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.
[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001. Differences found to be statistically insignificant are indicated by n/s.
Notes:
BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.
Estimates are sample-weighted; numbers of observations are unweighted.
Estimates are based on de facto household members.
Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table A1.7.3.6: Comparison of Mean Weight-for-Height Z-scores among Children Under 5 Years of Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

	Baseline (2011)			Endline (2017/2018)			Diff	p-value	Sig.
Characteristic	%	95% CI	n[a]	%	95% CI	n[a]		[b]	[c]
All children under 5 years of age	-0.9	-0.9 – -0.8	1,797	-0.4	-0.5 – -0.4	1,763	0.4	0.000	***
Child's sex									
Male	-0.8	-1.0 – -0.7	907	-0.4	-0.5 – -0.3	908	0.4	0.000	***
Female	-0.9	-0.9 – -0.8	890	-0.4	-0.5 – -0.3	855	0.4	0.000	***
Child's age									
0-11 months	-0.5	-0.7 – -0.3	352	-0.2	-0.4 – 0.0	407	0.3	0.011	*
12-23 months	-0.6	-0.8 – -0.4	338	-0.4	-0.5 – -0.2	357	0.2	0.019	*
24-35 months	-1.0	-1.1 – -0.9	340	-0.4	-0.5 – -0.2	331	0.6	0.000	***
36-47 months	-1.1	-1.2 – -0.9	408	-0.6	-0.8 – -0.5	306	0.4	0.000	***
48-59 months	-1.0	-1.2 – -0.9	359	-0.7	-0.8 – -0.6	362	0.4	0.000	***
Caregiver's education[d]									
No education	-1	-1.3 – -0.8	183	-0.9	-1.2 – -0.6	67	0.1	0.553	n/s
Less than primary	-1.1	-1.2 – -0.9	319	-0.5	-0.7 – -0.4	268	0.5	0.000	***
Completed primary	-0.8	-0.9 – -0.7	1,023	-0.5	-0.6 – -0.4	987	0.3	0.000	***
Completed secondary	-0.7	-0.9 – -0.4	109	-0.2	-0.4 – 0.0	99	0.5	0.006	**
Higher	-0.6	-0.9 – -0.4	163	-0.1	-0.3 – 0.1	342	0.5	0.001	**
Gendered household type									
Male and female adults	-0.9	-0.9 – -0.8	1,693	-0.4	-0.5 – -0.4	1,597	0.4	0.000	***
Female adults only	-0.7	-1.1 – -0.4	85	-0.4	-0.6 – -0.2	158	0.3	0.078	n/s
Male adults only	^	^	19	^	^	8	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on de facto household members.

Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table A1.7.4.1: Comparison of Prevalence of Severely Underweight Children Under 5 Years of Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

	Baseline (2011)			Endline (2017/2018)				p-value	Sig.
Characteristic	%	95% CI	n[a]	%	95% CI	n[a]	Diff.	[b]	[c]
All children under 5 years of age	8.4	6.5 – 10.2	1,797	3.3	2.2 – 4.4	1,797	-5.1	0.000	***
Child's sex									
Male	8.2	6.0 – 10.5	907	2.7	1.6 – 3.8	930	-5.5	0.000	***
Female	8.5	5.8 – 11.2	890	3.9	2.1 – 5.6	867	-4.7	0.004	**
Child's age									
0-11 months	4.1	1.8 – 6.4	352	3.9	1.5 – 6.3	415	-0.3	0.877	n/s
12-23 months	8.4	5.1 – 11.7	338	3.5	1.1 – 5.8	363	-5.0	0.016	*
24-35 months	8.3	4.2 – 12.4	340	2.5	0.9 – 4.2	336	-5.8	0.010	*
36-47 months	10.6	7.4 – 13.9	408	2.4	0.1 – 4.6	316	-8.3	0.000	***
48-59 months	9.8	6.2 – 13.4	359	3.9	1.7 – 6.1	367	-5.9	0.006	**
Caregiver's education[d]									
No education	12.2	5.3 – 19.1	183	10.7	1.8 – 19.5	70	-1.5	0.789	n/s
Less than primary	11.2	7.8 – 14.6	319	4.0	1.3 – 6.8	271	-7.1	0.001	**
Completed primary	7.8	5.7 – 9.9	1,023	3.1	2.0 – 4.3	1,007	-4.7	0.000	***
Completed secondary	3.3	0.0 – 7.3	109	1.3	0.0 – 3.2	100	-2.0	0.363	n/s
Higher	3.4	0.0 – 6.8	163	1.9	0.3 – 3.4	349	-1.5	0.414	n/s
Gendered household type									
Male and female adults	8.4	6.4 – 10.4	1,693	3.4	2.2 – 4.5	1,629	-5.1	0.000	***
Female adults only	4.6	0.2 – 9.0	85	2.3	0.0 – 4.7	160	-2.3	0.365	n/s
Male adults only	^	^	19	^	^	8	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

[d] The ZOI Survey identifies the primary caregiver of each age-eligible child. This person is likely, but not necessarily, the child's biological mother.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on de facto household members.

Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table A1.7.4.2: Comparison of Prevalence of Underweight Children Under 5 Years of Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

	Baseline (2011)			Endline (2017/2018)				p-value	
Characteristic	%	95% CI	n[a]	%	95% CI	n[a]	Diff.	[b]	Sig.[c]
All children under 5 years of age	32.3	29.4 – 35.2	1,797	17.5	15.2 – 19.7	1,797	-14.8	0.000	***
Child's sex									
Male	30.3	26.8 – 33.9	907	16.0	13.4 – 18.7	930	-14.3	0.000	***
Female	34.3	29.9 – 38.7	890	19.0	15.5 – 22.5	867	-15.3	0.000	***
Child's age									
0-11 months	18.1	13.3 – 22.9	352	14.0	10.1 – 17.9	415	-4.1	0.189	n/s
12-23 months	29.6	23.6 – 35.7	338	16.2	11.1 – 21.4	363	-13.4	0.001	**
24-35 months	32.9	27.2 – 38.7	340	18.5	13.9 – 23.0	336	-14.5	0.000	***
36-47 months	40.9	35.4 – 46.4	408	16.2	12.3 – 20.1	316	-24.7	0.000	***
48-59 months	37.8	31.6 – 43.9	359	22.8	18.0 – 27.7	367	-14.9	0.000	***
Caregiver's education[d]									
No education	41.3	28.7 – 53.9	183	32.4	16.9 – 47.8	70	-8.9	0.377	n/s
Less than primary	39.1	32.4 – 45.8	319	21.2	15.5 – 26.9	271	-17.9	0.000	***
Completed primary	31.2	28.1 – 34.3	1,023	18.5	15.7 – 21.4	1,007	-12.7	0.000	***
Completed secondary	14.9	6.1 – 23.6	109	13.0	6.1 – 19.9	100	-1.9	0.742	n/s
Higher	21.9	13.1 – 30.6	163	8.3	5.0 – 11.7	349	-13.5	0.005	**
Gendered household type									
Male and female adults	32.1	28.9 - 35.4	1,693	17.5	15.1 – 19.8	1,629	-14.6	0.000	***
Female adults only	29.3	18.2 - 40.4	85	17.1	10.8 – 23.4	160	-12.2	0.060	n/s
Male adults only	^	^	19	^	^	8	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

[d] The ZOI Survey identifies the primary caregiver of each age-eligible child. This person is likely, but not necessarily, the child's biological mother.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.

Estimates are sample-weighted; numbers of observations are unweighted.

Estimates are based on de facto household members.

Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

Table A1.7.4.3: Comparison of Mean Weight-for-Age Z-scores among Children Under 5 Years of Age in the Phase One ZOI of Bangladesh in Dhaka, Barishal, and Khulna divisions, in Total and by Selected Child, Caregiver, and Household Characteristics, Bangladesh Demographic and Health Surveys (BDHS)

Characteristic	Baseline (2011)			Endline (2017/2018)			Diff.	p-value [b]	Sig.[c]
	Mean z-score	95% CI	n[a]	Mean z-score	95% CI	n[a]			
All children under 5 years of age	-1.5	-1.6 – -1.5	1,797	-1.1	-1.1 – -1.0	1,797	0.5	0.000	***
Child's sex									
Male	-1.5	-1.6 – -1.4	907	-1.0	-1.1 – -0.9	930	0.5	0.000	***
Female	-1.6	-1.7 – -1.5	890	-1.1	-1.2 – -1.0	867	0.5	0.000	***
Child's age									
0-11 months	-1.0	-1.1 – -0.9	352	-0.9	-1.0 – -0.7	415	0.2	0.118	n/s
12-23 months	-1.4	-1.6 – -1.3	338	-1.0	-1.1 – -0.8	363	0.5	0.000	***
24-35 months	-1.7	-1.8 – -1.5	340	-1.0	-1.2 – -0.8	336	0.6	0.000	***
36-47 months	-1.8	-1.9 – -1.7	408	-1.2	-1.3 – -1.1	316	0.6	0.000	***
48-59 months	-1.7	-1.8 – -1.6	359	-1.3	-1.4 – -1.2	367	0.4	0.000	***
Caregiver's education[d]									
No education	-1.8	-2.0 – -1.6	183	-1.6	-1.9 – -1.3	70	0.2	0.351	n/s
Less than primary	-1.7	-1.9 – -1.6	319	-1.3	-1.4 – -1.1	271	0.5	0.000	***
Completed primary	-1.5	-1.6 – -1.4	1,023	-1.1	-1.2 – -1.1	1,007	0.4	0.000	***
Completed secondary	-1.1	-1.3 – -0.8	109	-0.8	-1.0 – -0.6	100	0.2	0.128	n/s
Higher	-1.1	-1.3 – -0.9	163	-0.5	-0.7 – -0.3	349	0.6	0.000	***
Gendered household type									
Male and female adults	-1.5	-1.6 – -1.5	1,693	-1.1	-1.1 – -1.0	1,629	0.5	0.000	***
Female adults only	-1.4	-1.7 – -1.1	85	-1	-1.2 – -0.8	160	0.4	0.022	*
Male adults only	^	^	19	^	^	8	^	^	^
Children only	^	^	0	^	^	0	^	^	^
Poverty status									
Poor	—	—	—	—	—	—	—	—	—
Non-poor	—	—	—	—	—	—	—	—	—
Household hunger									
Little to no hunger	—	—	—	—	—	—	—	—	—
Moderate hunger	—	—	—	—	—	—	—	—	—
Severe hunger	—	—	—	—	—	—	—	—	—

^ Results not statistically reliable, n<30

— = Data are not available as these data were not collected.

[a] Records missing information for the disaggregate variables have been excluded from the disaggregated estimates. The unweighted sample size reflects this loss in observations; therefore, disaggregate sample sizes may not total to the aggregated sample size.

[b] Significance tests were performed to determine whether a difference exists between the baseline and endline estimates.

[c] Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

[d] The ZOI Survey identifies the primary caregiver of each age-eligible child. This person is likely, but not necessarily, the child's biological mother.

Notes:

BDHS analyses are for all 20 Feed the Future ZOI districts. Please see Section 1.2 for a complete list of ZOI districts.
Estimates are sample-weighted; numbers of observations are unweighted. Estimates are based on de facto household members.
Source: Bangladesh Demographic and Health Survey (BDHS), 2011 and 2017/2018.

APPENDIX 2. METHODOLOGY

A2.1 Sampling and weighting

Sampling

The BIHS sample is statistically representative at the following levels: (1) nationally of rural Bangladesh; (2) rural areas of each of the seven administrative divisions of the country: Barishal, Chattogram, Dhaka, Khulna, Rajshahi, Rangpur, and Sylhet;[71] and (3) the Feed the Future ZOI. In preparation for conducting the 2011/2012 baseline survey, USAID provided IFPRI the list of Feed the Future locations (districts and *upazilas* [i.e., subdistricts]). IFPRI hired a consultant statistician who carried out the necessary sample calculations using the sampling frame developed from the community series of the 2001 population census of Bangladesh. Later, sampling weights were adjusted based on the latest population census of 2011.[72]

The domain of the national BIHS was the rural areas of the entire country, and the domain of the Feed the Future ZOI was 120 upazilas in rural areas of 20 districts in three divisions—Barishal, Dhaka, and Khulna. For the national BIHS sampling, all rural areas of the country were stratified into seven strata representing the seven divisions. The Feed the Future ZOI constitutes a separate stratum.

The sampling process included the following steps:

First, the total sample size for the BIHS 2011/2012 baseline was estimated using the following statistical formula that account for the estimated population proportion, design effect, and the confidence interval required to yield an estimate with a specified margin of error:

$$n = (p*(1-p)*deff*z*z)) / (e*e) \qquad (1)$$

where, n = sample size

p = estimated proportion of the population that presents the characteristic

$deff$ = design effect

z = level of confidence according to the standard normal distribution

e = tolerated margin of error or level of permissible error (1 percent, 5 percent, or 10 percent)

Since the value of p is unknown (the prevalence of the core indicator), it is common practice in the literature to assume p to be 0.5 (50 percent), which gives the maximum variance of the estimator of proportion and in turn the maximum value of sample size (n). Following the methodology used in the HIES 2005, on average, the design effect ($deff$) is 2. This means that for the sample to produce the same sampling error as a simple random sample of size n, the sample size must be increased by the factor 2. The sample size was calculated for a 95 percent level of confidence—that is, z = 1.96, and the

[71] The administrative structure of Bangladesh consists of divisions, districts, upazilas, and unions, in decreasing order by size. When BIHS sampling was carried out in 2011, there were 7 divisions, 64 districts, 484 upazilas, and 4,498 unions (all rural). However, a division called Mymensingh was created in 2015 from districts previously composing the northern part of Dhaka Division.

[72] The BIHS sampling was done by a consultant statistician, former Chief Statistician at the Bangladesh Bureau of Statistics, Ministry of Planning.

level of precision or relative error was set at 10 percent, with the margin of error, e =0.10*p, thus equaling 5 percent. Using these values in the aforementioned equation, the average sample size for each division is as follows:

$$n = (0.5(1-0.5)*2*1.96 * 1.96) / (0.05*0.05) = 768 \quad (2)$$

Using an average sample size of 768 households for each division, the national sample was estimated to be (768 * 7) = 5,376, which was rounded up to 5,500 households to account for potential non-response from sampled households. These 5,500 households were nationally representative of rural Bangladesh. The same statistical formula for the ZOI gave a sample size of 768 households, which was rounded up to 1,000 households to account for potential non-response from sampled households. Therefore, the total sample size for the 2011/2012 BIHS baseline was 5,500 households (nationally representative of rural Bangladesh) + 1,000 households (representative of the Feed the Future ZOI) = 6,500 households total.

Second, the number of PSUs required for the survey was determined following the methodology used by BBS for HIES 2010, where 20 households were selected per PSU for enumeration. Consistent with the HIES sampling methodology, the number of PSUs required for the nationally representative rural sample was determined by dividing the total national rural sample by the total number of households per PSU—that is, 5,500/20 = 275 PSUs (villages); and 1,000/20 = 50 PSUs were required for the ZOI sample.

Third, the Neyman allocation method was used to allocate the 275 sample PSUs among seven strata representing the seven divisions. The Neyman allocation method takes into account the size of the stratum as well as the variability within the stratum, which resulted in the following division-wise distribution of the national rural sample of 275 PSUs: 21 PSUs in Barishal, 48 PSUs in Chattogram, 87 PSUs in Dhaka, 27 PSUs in Khulna, 29 PSUs in Rajshahi, 27 PSUs in Rangpur, and 36 PSUs in Sylhet. Since the domain of the Feed the Future ZOI stratum includes upazilas from three divisions, proportional allocation was made to distribute the sample of 50 PSUs to three divisions: Barishal (14 PSUs), Dhaka (12 PSUs), and Khulna (24 PSUs).

Finally, the sample design of the BIHS followed a stratified sampling in two stages for selecting PSUs and then selecting households within each PSU. In the first stage, the number of PSUs (villages) allocated to each stratum were randomly selected with probability proportional to size (size being the number of households in each village) from the list of all villages within the stratum obtained from the 2001 population census data. In the second stage, conducted complete census in each of the 325 selected villages, prepared lists of all households from the village census data, and then randomly selected 20 households from each village from the census list. The sample selection process entailed eight draws: seven draws for seven strata (divisions) for the BIHS nationally representative samples, and one draw for the ZOI sample.

Initially, the ZOI stratum had a sample of 1,000 households in 50 PSUs. However, IFPRI researchers recognized that the sample size was inadequate for certain disaggregated analyses of the data from the ZOI sample of 1,000 households, such as by age categories, gendered household type, and some non-rice crops, such as maize. To obtain more robust estimates of disaggregated analysis and after consultation with USAID, IFPRI researchers expanded the ZOI sample using the following approach: The BIHS national sampling frame consists of 135 PSUs in Barishal, Dhaka, and Khulna divisions (strata), of which 52 PSUs (with 1,040 sample households) belong to ZOI survey upazilas (sub-districts). These 52

PSUs—which are common in both national and ZOI domains—were added to the original ZOI sample of 50 PSUs, giving the total sample of 2,040 households in 102 PSUs for the 2011/2012 ZOI baseline. This process did not entail any additional sample draws.

Since the sampling frame of the BIHS has the ZOI stratum and the seven strata representing the seven divisions, the analysis of data from expanded sample from the three divisional strata required estimation of appropriate sampling weights to obtain results that are statistically representative of the ZOI. The consultant statistician calculated the sampling weights and trained IFPRI research analysts on the use of the weights in analyzing the expanded sample of the ZOI dataset.

The Phase One ZOI endline assessment in 2018/2019 surveyed the same households from the Phase One baseline survey conducted in 2011/2012, making BIHS a panel dataset. Due to attrition, household merges, and household splits, the total sample size of the 2018/2019 ZOI endline survey was 2,064 households.[73]

Weighting

Based on the sampling procedure described in the previous section, the BIHS has two components: (i) a nationally representative component of rural Bangladesh that includes all seven strata representing the seven divisions, and (ii) the Feed the Future component drawn from the three divisional stratum that is representative of the ZOI. Appropriate sampling weights are used to obtain estimates that are statistically representative of the Feed the Future ZOI. A consultant statistician calculated the sampling weights and trained IFPRI research analysts on the use of the weights when generating estimates from the Feed the Future sample of BIHS. Additional information about Feed the Future sampling methodology can be found in the *Feed the Future Population-Based Survey Sampling Guide*.[74]

Steps to calculate survey weights for the Phase One baseline survey conducted in 2011/12

Data required for weighting of survey data were collected throughout the sampling process, and included: (1) PSU measure of size (where size is in terms of number of population or number of households) used for selection of PSUs; (2) measure of size of strata from which PSUs are drawn; (3) measure of size of PSUs at the time of listing; and (4) response rates among households, women, and

[73] At 2011/2012 baseline, 2,040 households were selected and surveyed for the Feed the Future Phase One ZOI stratum of the BIHS 2011/12 survey. Between baseline and endline survey rounds, 162 split households were formed from the original 2,040 households. Therefore, a total of 2,202 households were considered for survey at endline. However, of the 2,040 original households, 1,908 households were surveyed while 132 households attrited. From the 162 split households, 156 split households were surveyed while 6 split households attrited. This means a total of 1,908 + 156 = 2,064 households were surveyed at endline. Annual attrition rate is therefore [((132 + 6)/2,202)]*100/7 = 6.27/7 = 0.90 percent. Given the low attrition rate and the inclusion of split households in the survey, the Feed the Future stratum of BIHS still remains representative of the Phase One ZOI because sampling weights were adjusted accordingly from baseline following Himelein (2014) who recommends adjustments to the weights, which maintain representativeness as much as possible over multiple rounds of (panel) survey.

[74] Stukel (2018)

men. Sampling probability was computed separately for each sampling stage and for each village (that is, PSU). Weights were calculated for households, women, men, and children in the sample.

Design weights were calculated based on the separate sampling probabilities for each sampling stage and for each cluster:

P_{1hi}= first-stage sampling probability of the *i*-th cluster (village) in stratum *h*.
P_{2hi}= second-stage sampling probability within the *i*-th cluster (household selection).

The probability of selecting cluster *i* in the sample is:

$P_{1hi}= \frac{m_h \times N_{hi}}{N_h}$

The second-stage probability of selecting a household in cluster *i* is:

$P_{2hi}=\frac{n_{hi}}{L_{hi}}$

where,

m_h= number of sample clusters selected in stratum *h*.
N_{hi} = total population in the frame for the *i*-th sample cluster in stratum *h*.
N_h= total population in the frame in stratum *h*.
n_{hi}= number of sample households selected for the *i*-th sample cluster in stratum *h*.
L_{hi}= number of households listed in the household listing for the *i*-th sample cluster in stratum *h*.

The overall selection probability of each household in cluster *i* of stratum *h* is the product of the selection probabilities of the two stages:

$$P_{hi} = P_{1hi} \times P_{2hi} = \frac{m_h \times N_{hi}}{N_h} \times \frac{n_{hi}}{L_{hi}}$$

The design weight for each household in cluster *i* of stratum *h* is the inverse of its overall selection probability:

$$W_{hi} = \frac{1}{p_{hi}} = \frac{N_h \times L_{hi}}{m_h \times N_{hi} \times n_{hi}}$$

The sampling weight was calculated with the design weight corrected for non-response for each of the selected clusters. Response rates were calculated at the cluster level as ratios of the number of interviewed units over the number of eligible units, where units could be household or individual (woman, child).

Steps to calculate (panel) survey weights for the Phase One endline survey conducted in 2018/2019

The Phase One ZOI endline assessment in 2018/2019 surveyed the same households from the Phase One baseline survey conducted in 2011/2012, making BIHS a panel dataset. This means that the survey weights used for the endline (2018/2019) analysis required to be adjusted for potential attrition, splits ad

merges among the households to retain representativeness of the estimates. Himelein (2014)'s methodology was adapted to calculate the BIHS endline weights, which outlined six steps required for adjusting panel survey weights to maintain representativeness:[75]

1. Probability of EA (equivalent to stratum for BIHS) selection in subsequent panel survey rounds (Section 2.2 in Himelein (2014)):

The probability is calculated as $p_1 = \frac{m_h}{M_h}$, where m is the number of households subsampled into the subsequent panel round in stratum h and M is the total number of households in round 1 sample in stratum h. Since all responding baseline households were selected for re-survey in subsequent rounds of BIHS, the value of p_1 is equal to 1 at endline.

2. Probability of Household Selection into Tracking (Section 2.3 in Himelein (2014)):

Since some households from round 1 split into more than one household in subsequent panel rounds, the weight needs to account for the probability of tracking split-off households, p_2. The probability of tracking (adapted from the formula in pg. 42 of Himelein (2014)) is specified as follows:

$$p_2 = \{1 \; if \; not \; selected \; for \; tracking, or \; selected \; but \; no \; split - offs \; \frac{(z+1)}{1+z\left(\frac{q}{n}\right)} \; otherwise$$

where z is the number of new households entering the survey from a given parent household, q is the number of households in the EA in round 1, and n is the (randomly selected) number of eligible households within each EA for which all split-offs were tracked. In BIHS, all split-households from round 1 were eligible for tracking in subsequent survey rounds if the split-households were located within the same sub-district as the parent household. Therefore, in BIHS, $n = q$, and thus $p_2 = 1$.

3. Fair Share Correction (Section 2.4 in Himelein (2014)):

According to Himelein (2014), a household's probability of selection is increased by a factor of two for all households that have new members arriving from other households. This component is referred to as k in Himelein (2014). In BIHS, $k = 2$ was assigned to all households that received a new member through marriage or a new member that returned from divorce or separation (who was not a member in round 1).

4. Attrition Correction Factor (Section 2.6 in Himelein (2014)):

To obtain the attrition adjustment factor, the probability that a sample household was successfully re-interviewed in subsequent rounds is modeled with the linear logistic model at the level of the individual.

A binary response variable is created by coding the response disposition for eligible household members that were not interviewed in the subsequent panel rounds as zero, and household members that were interviewed as one. All household members in the previous panel round are considered eligible, except those who are new members or members who have died (Himelein 2014, pg. 43). Additionally, those members who left the household (to join another household) due to marriage or divorce are not

[75] Himelein (2014)

considered eligible members in BIHS. This is because those individuals become a part of existing households, which were not previously surveyed in BIHS. Per Himelein (2014, pg. 43), household members who have split from the parent household and relocated outside the sub-district (i.e. *upazila*) were not tracked, but were accounted for in the attrition adjustment factor as they were identified as migrant members.

A logistic response propensity model is then estimated, including the household and individual characteristics measured in the previous round as covariates. The covariates selected for the logistic model were selected to closely match the list of covariates provided in Himelein (2014, pg. 43). The covariates used are listed as follows:

- being a split-off member targeted for tracking (binary)
- demographic characteristics, including sex (binary), age (continuous), marital status (categorical)
- educational attainment (categorical)
- currently attending school (binary)
- labor force participation (binary)
- household size (discrete)
- household per capita daily consumption expenditure (quintiles)
- value of household's durable assets (quintiles)
- value of household's productive assets (quintiles)
- household had savings in the last 12 months (binary)
- value of household's current cash savings (quintiles)
- household receives remittance (binary)
- household earns livelihood from livestock (binary)
- household earns livelihood from agriculture (binary)
- household earns livelihood from nonfarm enterprises (binary)
- household owns residence (binary)
- material used for outer wall (categorical)
- material used for roof (categorical)
- material used for floor (categorical)
- household owns a mobile phone in working condition (binary)
- household's district of residence (categorical)

The logistic model allowed us to obtain predicted probability of response for each household member in the subsequent survey round. The response probabilities were then aggregated at the household level by calculating the average. The household-level predicted response probabilities were then ranked into 10 equal groups (deciles), and the average response rate for each decile was calculated at the household-level. The reciprocal of that average is defined as the attrition adjustment factor (ac).

Finally, the steps in Section 2.5 and the end of 2.6 are combined to produce the revised weights.

Since there are three rounds of BIHS (2011/12, 2015, and 2018/19), we calculated the weights in chronological order. First, the midline weights were calculated following the steps outlined above and then applied the following formula adapted from Sections 2.5 and 2.6 of Himelein (2014):

$$Weight_{midline} = Weight_{baseline} \times \left(p_{1,midline} \times p_{2,midline} \times k_{midine}\right)^{-1} \times ac_{midline}$$

Then, the same steps were followed for calculating the endline weights using the following formula adapted from Sections 2.5 and 2.6 in Himelein (2014):

$$Weight_{endline} = Weight_{midline} \times \left(p_{1,endline} \times p_{2,endline} \times k_{endine}\right)^{-1} \times ac_{endline}$$

5. Trimming

Following Section 2.7 in Himelein (2014), the weights were 'trimmed' by winsorizing the values at the 2nd and 98th percentile of the distribution.

6. Post-Stratification

Himelein (2014) suggests an additional component in the weights calculation to correct for population growth 'at a level of disaggregation such that the post-stratification correction is at the lowest reliable level available from an auxiliary data source.' The population growth rate between the baseline and endline surveys in the Feed the Future ZOI can be projected based on the inter-census growth rates estimated from the 2001 and 2011 population census data from BBS for the districts in the Feed the Future ZOI. However, these are relatively old data and any projection from these data does not account for the lower (and in some instances negative) rates of population growth observed in many southwestern districts of Bangladesh in recent years.

For the southwestern districts of Bangladesh, the average annual population growth rate of 0.15 percent between 2000 and 2010 has decreased to 0.042 percent within the period 2011-2019.[76] Such change in population growth rates can be attributed to a low fertility rate due to sociodemographic change and an increase in out-migration rates due to environmental stresses, economic vulnerability, and prospects of remittance income in coastal Bangladesh.[77]

Himelein (2014) observes that, "…Post-stratification should therefore be seen more as a fine-tuning adjustment rather than a major realignment. If the weights are adjusted using poor-quality auxiliary information, there is the possibility of reducing precision or introducing bias into the estimates."

The above discussion provides a strong case for not using the post-stratification weights if the population growth data are not of high quality. We believe this is the case if we extrapolate from the inter-census growth rates estimated from the 2001 and 2011 population census data.

Post adjustment of weights

Although the sampling frame at baseline was developed from the community series of the population census 2001, the baseline weights were calculated using household population figures in the ZOI from the 2011 population census. When the 2011/2012 baseline survey was conducted, the 2011 population census data were not yet publicly available.

[76] Szabo (2015); WorldPop (2018)

[77] Szabo et al. (2018)

As mentioned above, endline weights were computed by applying appropriate adjustments to baseline weights following the Himelein (2014) paper.

A2.2 Poverty prevalence and consumption expenditure methods

Data source

Prevalence of poverty at US$1.25 (2005 PPP) per person per day was calculated using the data from the Feed the Future ZOI Stratum of IFPRI's Bangladesh Integrated Household Survey (BIHS). BIHS 2011/2012 is the baseline survey, and BIHS 2018/2019 is the endline survey. Depth of poverty at $1.25 (2005 PPP) per person per day, and Average shortfall at $1.25 (2005 PPP) per person per day, both in terms of USD (2005 PPP) and percentage of poverty line, were also calculated from BIHS 2011/2012 and 2018/2019.

The Household Roster and Household Consumption Expenditure modules of the BIHS questionnaire are used to calculate the per capita expenditures and prevalence of poverty indicators. The household consumption expenditure module is similar to the LSMS, where households' consumption of various food and non-food items is measured to infer household income and well-being. Food and non-food consumption are covered in separate modules in the BIHS questionnaire.

Prevalence of poverty at the National Extreme Threshold of Poverty of Bangladesh was calculated using HIES data. The sample was restricted to rural Barishal and rural Khulna divisions. HIES 2010 was regarded as the baseline survey and HIES 2016 was regarded as the endline survey. Depth of poverty at the national extreme threshold, and average shortfall at the national extreme threshold, both in terms of 2005 PPP and percentage of poverty line, were also calculated from HIES 2010 and 2016.

Data preparation

Data excluded from analysis:

Consumption expenditure calculation from BIHS 2011/2012 and 2018/2019

- All lumpy expenditures and life cycle events are excluded from consumption expenditure. Such expenses include: expense for pilgrimage, dowry/dower, caesarean section, land purchase, etc. The transfers of money to entities outside of the households (for example, donations, insurance, taxes, or levies) or expenses on large purchases that occur infrequently, as Deaton and Zaidi (2002) have suggested, are excluded because they either do not contribute to the household's well-being or are considered "lumpy expenditures" that should not be included within the aggregate.[78]
- Durable goods costs are excluded but use value of durable goods are included. For durable goods, data were collected in a manner that allowed us to calculate use value per annum/month. The BIHS collected information for a list of durable items in the asset module of the questionnaire. Information included - the number of such items owned, the year of purchase, the price of purchase, and the estimate of the current value of the item. Since durable goods are typically expensive and used year after year, the purchase price or the current value is not

[78] Deaton and Zaidi (2002)

added directly to the consumption aggregate. Instead, the consumption value of durable goods is estimated as a flow of services accrued to the household—that is, the use value of the durable good. The use value includes the value of durable goods used till date of the survey, and the opportunity cost of interest earnings. The calculation, however, excludes antiques and jewelry which do not depreciate in value over time.

- The rental value of housing for households who rented the housing units was used as the housing expenditure. For owner-occupied households or employer-provided households, the expected rental values were used as housing expenditure. In all such cases, the respondent reported the expected value of the rent by estimating their housing cost based on the cost of housing for similar dwelling units in the neighborhood; thus, there was no need to use a hedonic regression to estimate rental values where the expected value was missing.

Consumption expenditure calculation from HIES 2010 and 2016

- The Household Income and Expenditure Survey is a secondary source dataset. IFPRI does not have access to details regarding the calculation of consumption expenditure from HIES. For more details on calculating the consumption expenditure from HIES, please refer to Ahmed et al. (2017).[79]

Imputations:

Consumption expenditure calculation from BIHS 2011/2012 and 2018/2019

- For items with missing prices, prices were imputed from the next available level of disaggregation. If household level price was not available, then price was imputed from the village level or from union level or from upazila level or from district level or from division/strata level, depending on the market from which we were able to find the price of the items that have missing value. This imputation was done for only a few food items which had missing price at the household level.
- The data was inspected for outliers so that expenditure measures were not distorted. Generally, 3 standard deviations (Z value) were calculated for continuous variables to test whether the distribution is normal or skewed and took other standard measures for data validity and reliability process.

Consumption expenditure calculation from HIES 2010 and 2016

- The HIES is a secondary source dataset. IFPRI does not have access to details regarding the calculation of the consumption expenditure from HIES.

[79] Ahmed, F., D. Roy, M. Yanez-Pagans, N. Yoshida. 2017. *Design of a Multi-Stage Stratified Sample for Poverty and Welfare Monitoring with Multiple Objectives: A Bangladesh Case Study.* Policy Research Working Paper 7989. Washington, DC: World Bank. http://documents.worldbank.org/curated/en/480321488461618499/pdf/WPS7989.pdf

Prices:

Consumption expenditure calculation from BIHS 2011/2012 and 2018/2019

- Market surveys were performed to collect village level prices along with the collection of household prices based on the BIHS questionnaire.
- There is little temporal and spatial price variation in the Feed the Future data. Since the BIHS data was collected over three months within a single season, there is little variation of price over time. Furthermore, markets are integrated in the 20 districts of the Feed the Future ZOI, with prices remaining relatively constant. Thus, there is little spatial variation in prices as well.

Consumption expenditure calculation from HIES 2010 and 2016

- The HIES is a secondary source dataset. IFPRI does not have access to details regarding the calculation of consumption expenditure from HIES.

Other adjustments:

Weights for BIHS 2011/2012 and 2018/2019

- Based on the sampling procedure described previously, weights were calculated for household level based on the proportion of households in the survey to the number of actual households in each stratum of the sample. Population weights are generated by multiplying the household sampling weight by the number of household members present in each of the sampled households in the BIHS survey.

Consumption expenditure calculation from HIES 2010 and 2016

- The Household Income and Expenditure Survey is a secondary source dataset. IFPRI does not have access to details regarding the calculation of consumption expenditure from HIES.

Currency conversions using consumer price indices and purchasing power parity for BIHS 2011/2012 and 2018/2019

In order to analyze the data, the consumption values and poverty thresholds had to be adjusted for inflation and converted between *Taka* and USD. The inflation adjustments were done using the Basic Needs Price Index (BNPI) and the conversion between *Taka* and USD was done using the 2005 PPP.[80] An important feature of this analysis is that the BNPI is used rather than the Consumer Price Index (CPI) to adjust the poverty line over time. The main reason for using the BNPI rather than CPI stems from the decision of the BBS (also followed by the World Bank) to not rely on CPI for updating the poverty line, as the assumption is that CPI is downward biased in the estimation of inflation as

[80] According to the World Bank, purchasing power parity conversion factor is "The number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as U.S. dollar would buy in the United States." The Atlas method is a variation of the simple exchange rate that accounts for cross-country exchange rate fluctuations. The World Bank defines the Atlas conversion factor for any year as, "The average of a country's exchange rate for that year and its exchange rates for the two preceding years, adjusted for the difference between the rate of inflation in the country and international inflation; the objective of the adjustment is to reduce any changes to the exchange rate caused by inflation."

experienced by the poor of Bangladesh. The Basic Needs Price Index (BNPI), is calculated by the BBS for every round of the HIES from 1990/1991 to 2016.

Poverty thresholds estimated from BIHS 2011/2012 and 2018/2019

Prevalence of Poverty at $1.25 (2005 PPP) per person, per day

The local currency equivalent (LCE) of the PPP $1.25 per day poverty line was calculated as follows:

$$LCE = 1.25\ x\ PPP_{2005}\ x \left[\frac{Survey\ Month\ and\ Year\ Price\ index}{2005\ Price\ Index}\right]$$

The $1.25 2005 PPP threshold is equivalent to 64.678 taka, per person, per day in 2011/2012 prices and 92.109 taka, per person, per day in 2018/2019 prices.

Daily Per Capita Consumption Expenditure in Constant 2010 USD at 2005 PPP

To report per capita expenditure measures in 2010 USD, per capita expenditures measured in Bangladeshi Taka local currency units (LCU) were converted to 2010 USD using the Basic Needs Price Index (BNPI) and the PPP Index estimated by the World Bank. The following formula was used: (2005 BNPI LCU/ Survey Month and Year BNPI LCU)*1/(PPP 2005)* (2010 USD CPI /2005 USD CPI) where LCU PPP 2005 = 25.49389, 2011-12 BNPI LCU = 202.96, 2018-19 BNPI LCU = 289.04 and 2005 BNPI LCU = 100, 2010 USD CPI =111.65, and 2005 USD CPI = 100. The conversion factor for 2011/2012 was 0.021579 and for 2018-19 was 0.015152.

Extreme and national poverty thresholds estimated from HIES 2010 and 2016

The national extreme poverty threshold is the national lower poverty line, which is the summation of the food poverty line and the lower non-food allowance, as calculated by BBS using HIES. The national poverty threshold is the national upper poverty line, which is the summation of the food poverty line and the upper non-food allowance, as calculated by BBS using HIES. According to the HIES 2010 and 2016 Reports, published by BBS, the upper and lower poverty lines are kept constant over time in real terms, so that proper comparisons of poverty rates can be made across time. The poverty lines for 2010 and 2016 have been updated from the 2005 poverty lines using price indices constructed for each quarter (BBS 2010; BBS 2016). The table shows the lower and upper poverty lines for rural Barishal and rural Khulna divisions that were used to calculate poverty from HIES 2010 and 2016.

Table A2.1.1: National Extreme Poverty Threshold and National Poverty Threshold, in *Taka* per person per month, of rural Barishal and rural Khulna divisions of Bangladesh, 2010 and 2016

	National Extreme Poverty Threshold (Lower Poverty Line)	National Poverty Threshold (Upper Poverty Line)
2010		
Barishal (rural)	1,284	1,485
Khulna (rural)	1,192	1,435
2016		
Barishal (rural)	1,778	2,056
Khulna (rural)	1,677	2,019

Source: Household Income and Expenditure Survey, 2010 and 2016.

Table A2.1.2 presents the national extreme poverty threshold and national poverty threshold from 2005 in *Taka* per capita per day for rural Barisal and Khulna divisions. Using the PPP conversion rate of USD 1.00 (2005 PPP) = BDT 25.49389, the table also presents the USD equivalent of these thresholds in 2005 prices.

Table A2.1.2: National Extreme Poverty Threshold and National Poverty Threshold, in Taka per person per day, 2005, presented in USD PPP (2005) equivalents, of rural Barishal and rural Khulna divisions of Bangladesh

	Barishal (rural)	Khulna (rural)
National Extreme Threshold (Lower Poverty Line) in *Taka* per capita per day	24.76	21.44
USD (2005 PPP) equivalent of National Extreme Threshold (Lower Poverty Line) in per capita per day	0.97	0.84
National Threshold (Upper Poverty Line) in *Taka* per capita per day	30.44	24.43
USD (2005 PPP) equivalent of National Threshold (Upper Poverty Line) in per capita per day	1.19	0.96

Source: Feed the Future Bangladesh ZOI Survey, 2018/2019.
Note: USD 1.00 (2005 PPP) = BDT 25.49389

APPENDIX 3. DATA QUALITY

This appendix presents information that reflects the quality of data collected in the Phase One Zone of Influence in the Feed the Future Bangladesh ZOI Survey 2018/2019. Data-driven decisions call for high-quality data collection. High quality data was ensured in the endline ZOI Survey through field monitoring, data post-processing, and data analysis. The questionnaire was revised based on feedback and pre-tested in the field to ensure that the survey questionnaire was error-free and to serve as an end-to-end rehearsal of all content and survey procedures. During field-level data collection, survey supervisors routinely oversaw interviews conducted by enumerators, and verified that enumerators completed all questionnaires on a daily basis. If the supervisors detected inconsistencies in responses in completed questionnaires, they visited the related respondents to identify the reasons and correct the responses as needed. In addition, the supervisors made random checks of about 10 percent of the completed questionnaires by revisiting the sample households. The Bangladesh ZOI Survey used the CSPro software for data entry and conducting data quality checks, including completion checks, structure checks, and consistency checks.

Similarly, continuous data monitoring in the field is fundamental to the quality of data collection. In addition to using the data collection and monitoring approach described in the Feed the Future ZOI Survey Toolkit field manuals,[81] the Bangladesh ZOI Survey in-country data manager ran field check tables that provided a management system for checking data quality. These tables cross-checked certain quality control indicators by field teams and individual interviewers to detect potential areas in which correction and remedial action were required. Any issues that were attributed to non-sampling error (that is, field-based error) were communicated as feedback to the field teams.

In the post-processing stage, secondary editing procedures were implemented according to the Feed the Future ZOI Survey Data Processing Manual to ensure the data were clean and of the highest quality. During the analysis phase, any inconsistencies or issues identified by data analysts were communicated to the data processing manager for troubleshooting and resolution.

Table A3.1.1 presents the household completion rates.

During the endline survey, the teams were formed containing one supervisor for two teams of two interviewers. In total, 23 survey teams were deployed to collect data for the ZOI endline survey.

The overall household response rate was 99.04 percent, which is greater than the target of 95 percent for the household response rate. Non-response at endline was mostly due to loss through attrition of panel households having moved away that was not compensated by the addition of split-off households to the sample.

[81] USAID (2018)

Table A3.1.1: Household Completion Rate

Percent distribution of sampled households by result of household interview and household response rate by interviewer team, Feed the Future Bangladesh ZOI Survey 2018/2019

Team	Result of household interview								Total number	Total percentage	Household response rate (%) [a]
	Completed (1)	Not at home (2)	Extended absence (3)	Refused (5)	Dwelling vacant (6)	Not a dwelling (7)	Ill or impaired (10)	Other (96)			
Team 1	52	0	0	3	6	0	0	0	61	100.0	94.6
Team 2	81	1	0	0	5	0	0	0	87	100.0	98.8
Team 3	80	0	0	0	5	0	0	0	85	100.0	100.0
Team 4	100	1	0	1	4	0	0	0	106	100.0	98.0
Team 5	82	1	0	0	4	0	0	0	87	100.0	98.8
Team 6	97	1	0	1	3	0	0	0	102	100.0	98.0
Team 7	109	0	0	1	3	0	0	0	113	100.0	99.1
Team 8	44	0	0	0	1	0	0	0	45	100.0	100.0
Team 9	56	3	0	0	5	0	0	1	65	100.0	94.9
Team 10	81	1	0	0	3	0	0	0	85	100.0	98.8
Team 11	118	1	0	0	6	0	0	1	126	100.0	99.2
Team 12	72	3	0	0	6	0	0	2	83	100.0	96.0
Team 13	60	0	0	0	3	0	0	0	63	100.0	100.0
Team 14	104	0	0	0	3	0	0	0	107	100.0	100.0
Team 15	101	0	0	0	6	0	0	1	108	100.0	100.0
Team 16	111	0	0	0	4	0	0	1	116	100.0	100.0
Team 17	107	0	0	0	3	0	0	0	110	100.0	100.0
Team 18	129	0	0	0	6	0	0	0	135	100.0	100.0
Team 19	70	1	0	0	14	0	0	0	85	100.0	98.6
Team 20	86	0	0	0	6	0	0	1	93	100.0	100.0
Team 21	99	1	0	0	9	0	0	0	109	100.0	99.0
Team 22	102	0	0	0	1	0	0	0	103	100.0	100.0
Team 23	123	0	0	0	5	0	0	0	128	100.0	100.0
All teams	2,064	14	0	6	111	0	0	7	2,202	100.0	99.0

[a] Household response rate=(1)/[(1)+(2)+(3)+(5)+(10)]x100. The target is 95 percent for the household response rate.
Source: Feed the Future Bangladesh ZOI Survey, 2018/2019.

Table A3.1.2 presents information about the presence of primary adult decision-makers in households with a completed roster.

Virtually all (99.9 percent) of the households at endline had at least one primary adult decision-maker. Notably, about 15 percent of households had no adult male member present at endline, whereas less than 1 percent of households had no adult female member present at endline.

Table A3.1.2: Primary Male and Female Decision-makers

Number of households with a completed roster and, among those households, the percentage with at least one male member 18 years of age or older, the percentage with a male decision-maker, the percentage with at least one female member 18 years of age or older, the percentage with a female decision-maker, and the percentage of households with at least one decision-maker, by interviewer team, Feed the Future Bangladesh ZOI Survey 2018/2019

		Male		Female		
Team	HH with Module 1 completed (N)	HH with at least one male member 18+ (%)	HH with primary adult male decision-maker (%)	HH with at least one female member 18+ (%)	HH with primary adult female decision-maker (%)	HH with at least one primary adult decision-maker (%)
Team 1	52	88.5	88.5	100.0	100.0	100.0
Team 2	81	90.1	90.1	100.0	100.0	100.0
Team 3	80	90.0	90.0	98.8	97.5	98.8
Team 4	100	89.0	89.0	99.0	99.0	100.0
Team 5	82	89.0	89.0	100.0	98.8	100.0
Team 6	97	83.5	83.5	99.0	99.0	100.0
Team 7	109	89.0	89.0	99.1	99.1	100.0
Team 8	44	84.1	84.1	100.0	97.7	100.0
Team 9	56	82.1	82.1	98.2	98.2	100.0
Team 10	81	72.8	72.8	100.0	100.0	100.0
Team 11	118	88.1	87.3	100.0	100.0	100.0
Team 12	72	84.7	84.7	98.6	98.6	100.0
Team 13	60	95.0	95.0	98.3	98.3	100.0
Team 14	104	88.5	88.5	99.0	99.0	100.0
Team 15	101	87.1	87.1	100.0	100.0	100.0
Team 16	111	93.7	93.7	98.2	98.2	100.0
Team 17	107	82.2	82.2	100.0	100.0	100.0
Team 18	129	82.2	82.2	99.2	98.5	100.0
Team 19	70	70.0	70.0	100.0	100.0	100.0
Team 20	86	93.0	93.0	100.0	100.0	100.0
Team 21	99	75.8	75.8	99.0	99.0	100.0
Team 22	102	72.6	72.6	99.0	99.0	100.0
Team 23	123	80.5	80.5	100.0	100.0	100.0
All teams	2,064	84.8	84.7	99.4	99.2	99.9

HH=household
Note: The target is [100% - expected prevalence of child-only households].

Source: Feed the Future Bangladesh ZOI Survey, 2018/2019.

Table A3.1.3 assesses age heaping in the household roster. Age heaping can be a common occurrence in surveys; however, a high rate of age heaping can introduce serious bias to the survey results and indicates less careful interviewing. The ZOI endline data show that 17.5 percent of household members in five-year age groups had their ages recorded as ending in 5 or 0, which is well below the 30 percent target for all age ranges.

Table A3.1.3: Age Heaping in the Household Roster

Percentage of household members in 5-year age groups with ages recorded as ending in 5 or 0 by interviewer team, Feed the Future Bangladesh ZOI Survey 2018/2019

	Ages of household members											
Team	Ages 3-7 recorded as 5 (%)	Ages 8-12 recorded as 10 (%)	Ages 13-17 recorded as 15 (%)	Ages 18-22 recorded as 20 (%)	Ages 23-27 recorded as 25 (%)	Ages 28-32 recorded as 30 (%)	Ages 33-37 recorded as 35 (%)	Ages 38-42 recorded as 40 (%)	Ages 43-47 recorded as 45 (%)	Ages 48-52 recorded as 50 (%)	All ages ending in 5 or 0 (%)	Number of household members
Team 1	23.8	18.5	15.8	0.0	27.3	7.1	12.5	6.3	20.0	16.7	17.2	198
Team 2	16.1	18.9	25.8	36.0	23.5	14.7	21.4	25.0	25.0	20.0	23.5	319
Team 3	8.0	13.3	8.8	34.6	20.0	11.8	5.6	18.2	26.7	9.1	14.7	333
Team 4	14.7	18.9	27.9	21.7	20.0	14.3	11.4	15.6	3.6	16.7	16.1	378
Team 5	14.7	10.3	21.2	25.0	21.4	21.7	15.8	7.4	13.6	9.5	16.9	349
Team 6	20.9	16.7	16.4	35.5	24.0	28.6	15.4	25.9	14.3	13.6	18.8	410
Team 7	21.6	29.6	19.6	14.7	11.8	32.1	34.6	30.8	44.8	22.2	25.1	399
Team 8	18.8	27.3	14.3	33.3	7.1	6.3	0.0	6.3	0.0	0.0	13.2	159
Team 9	5.9	7.1	35.3	11.8	16.7	5.6	33.3	0.0	9.5	0.0	11.3	213
Team 10	22.2	21.9	13.3	28.0	18.2	6.7	18.5	7.1	20.0	15.4	16.8	309
Team 11	13.5	19.2	20.0	19.6	10.3	8.8	8.0	0.0	6.3	0.0	11.6	490
Team 12	30.3	21.4	20.0	20.0	5.6	10.0	11.8	5.3	10.5	10.5	16.3	283
Team 13	14.3	26.3	13.8	21.1	25.0	9.5	5.3	0.0	0.0	42.9	17.3	255
Team 14	32.0	3.9	13.9	32.0	22.7	22.7	20.0	10.3	0.0	9.7	14.8	365
Team 15	24.3	16.7	22.0	25.7	4.0	10.7	3.3	12.9	18.4	13.0	16.0	424
Team 16	17.1	26.7	13.3	24.4	16.3	15.8	5.4	23.1	13.0	8.3	19.1	444
Team 17	19.6	15.6	15.0	23.9	19.1	18.4	10.7	6.9	17.9	8.0	17.6	444
Team 18	32.2	20.6	25.0	34.1	32.3	12.8	4.2	2.5	3.9	7.7	19.3	549
Team 19	29.3	23.1	23.3	29.4	21.1	8.0	5.9	6.3	0.0	40.0	19.5	303
Team 20	27.6	37.1	9.1	12.5	36.8	14.8	12.1	10.7	4.2	7.1	17.4	334
Team 21	21.4	18.0	16.3	19.4	20.8	19.6	38.5	10.0	31.3	0.0	21.0	438
Team 22	32.7	28.3	13.2	16.7	20.0	22.2	0.0	7.1	28.6	15.8	21.5	428
Team 23	12.9	20.6	17.0	20.0	13.3	6.1	15.0	8.6	4.2	7.7	13.8	507
All teams	21.3	20.2	18.2	24.1	18.7	14.8	12.7	10.7	14.1	12.1	17.5	8,331

Note: The target for all age ranges is 30 percent.
Source: Feed the Future Bangladesh ZOI Survey, 2018/2019.

Table A3.1.4 presents the mean number of eligible women of reproductive age per household.

The number of eligible women and the total number of completed households were used to compute the mean number of eligible women per household. An average of 1.11 eligible women of 15-49 years of age were present per household during the 2018/2019 endline survey. The target mean number of eligible women per household of 1.15 was obtained from the Bangladesh Bureau of Statistics (BBS) 2011 Population and Housing Census data, which are the latest available census data in Bangladesh.

Table A3.1.4: Eligible Women per Household

Mean number of eligible women 15-49 years of age per household, Feed the Future Bangladesh ZOI Survey 2018/2019

Team	Completed household (N)	Eligible women in completed household (N)	Mean number of eligible women per household
Team 1	52	53	1.0
Team 2	81	91	1.1
Team 3	80	87	1.1
Team 4	100	111	1.1
Team 5	82	97	1.2
Team 6	97	110	1.1
Team 7	109	121	1.1
Team 8	44	47	1.1
Team 9	56	55	1.0
Team 10	81	78	1.0
Team 11	118	130	1.1
Team 12	72	76	1.1
Team 13	60	66	1.1
Team 14	104	107	1.0
Team 15	101	117	1.2
Team 16	111	120	1.1
Team 17	107	125	1.2
Team 18	129	145	1.1
Team 19	70	78	1.1
Team 20	86	103	1.2
Team 21	99	106	1.1
Team 22	102	130	1.3
Team 23	123	133	1.1
All teams	2,064	2,286	1.1

Note: The target is 1.15 eligible women per household.
Source: Feed the Future Bangladesh ZOI Survey, 2018/2019.

Table A3.1.5 presents the mean number of eligible children under six years of age per household.

On average, each household had 0.46 eligible children younger than six years of age. The target number for eligible children younger than six years of age from the population census data could not be obtained; however, the available 2011 population census data indicate that the target number for eligible children younger than five years of age is 0.36 eligible children per household.

Table A3.1.5: Eligible Children per Household

Mean number of eligible children younger than 6 years of age per household, Feed the Future Bangladesh ZOI Survey 2018/2019

Team	Completed household (N)	Eligible children in household (N)	Mean number of eligible children per household
Team 1	52	22	0.4
Team 2	81	35	0.4
Team 3	80	38	0.5
Team 4	100	30	0.3
Team 5	82	37	0.5
Team 6	97	49	0.5
Team 7	109	36	0.3
Team 8	44	15	0.3
Team 9	56	27	0.5
Team 10	81	42	0.5
Team 11	118	53	0.5
Team 12	72	33	0.5
Team 13	60	24	0.4
Team 14	104	27	0.3
Team 15	101	41	0.4
Team 16	111	57	0.5
Team 17	107	54	0.5
Team 18	129	84	0.7
Team 19	70	50	0.7
Team 20	86	33	0.4
Team 21	99	61	0.6
Team 22	102	52	0.5
Team 23	123	58	0.5
All teams	2,064	958	0.5

Note: The target is 0.36 number of eligible children per household.*
* The number represents children younger than five years of age as data for children younger than six years of age were not available from the BBS 2011 population census data and could not be estimated for endline.
Source: Feed the Future Bangladesh ZOI Survey, 2018/2019.

Table A3.1.6 presents the eligibility and response rate of primary adult female decision-makers. Among the eligible 2,047 primary adult female decision-makers at endline, 2,040 responded to the module. The overall response rate is greater than 99.5 percent, which is above the target response rate of 95 percent.

Table A3.1.6: Module 6 (Women) Women's Empowerment in Agriculture Module, Eligibility and Response Rate

Percent distribution of eligible women (primary adult female decision-maker) by result of individual outcome, by interviewer team, Feed the Future Bangladesh ZOI Survey 2018/2019

Team	Result of module		Total (%)	Number of women	Response rate (%)[a]
	Completed (code 1)	Respondent not at home (code 4)			
Team 1	52	0	100.0	52	100.0
Team 2	81	0	100.0	81	100.0
Team 3	78	0	100.0	78	100.0
Team 4	99	0	100.0	99	100.0
Team 5	81	0	100.0	81	100.0
Team 6	96	0	100.0	96	100.0
Team 7	108	0	100.0	108	100.0
Team 8	43	0	100.0	43	100.0
Team 9	55	0	100.0	55	100.0
Team 10	80	1	100.0	81	98.8
Team 11	118	0	100.0	118	100.0
Team 12	71	0	100.0	71	100.0
Team 13	59	0	100.0	59	100.0
Team 14	103	0	100.0	103	100.0
Team 15	100	1	100.0	101	99.0
Team 16	106	3	100.0	109	97.2
Team 17	107	0	100.0	107	100.0
Team 18	127	0	100.0	127	100.0
Team 19	69	1	100.0	70	98.6
Team 20	86	0	100.0	86	100.0
Team 21	97	1	100.0	98	99.0
Team 22	101	0	100.0	101	100.0
Team 23	123	0	100.0	123	100.0
All teams	2,040	7	100.0	2,047	99.7

[a] The response rate is the percentage of households completed divided by the number with response codes 1 and 5. The target response rate is 95 percent.
Source: Feed the Future Bangladesh ZOI Survey, 2018/2019.

Table A3.1.7 presents the eligibility and response rate of primary adult male decision-makers.

Among the eligible 1,749 primary adult male decision-makers at endline, 1,740 respondents completed the WEAI module. Some of the respondents were not at home during the fieldwork; therefore, they were unable to complete the module. The overall response rate was 99.5 percent, which is above the target response rate of 95 percent.

Table A3.1.7: Module 6 (Men) Women's Empowerment in Agriculture Module, Eligibility and Response Rate

Percent distribution of eligible men (primary adult male decision-maker) by result of individual outcome, by interviewer team, Feed the Future Bangladesh ZOI Survey 2018/2019

Team	Result of module			Total (%)	Number of men	Response rate (%)[a]
	Completed (code 1)	Respondent not at home (code 4)	Refused (code 5)			
Team 1	46	0	0	100.0	46	100.0
Team 2	73	0	0	100.0	73	100.0
Team 3	71	0	1	100.0	72	98.6
Team 4	89	0	0	100.0	89	100.0
Team 5	73	0	0	100.0	73	100.0
Team 6	79	0	2	100.0	81	97.5
Team 7	96	1	0	100.0	97	99.0
Team 8	37	0	0	100.0	37	100.0
Team 9	46	0	0	100.0	46	100.0
Team 10	59	0	0	100.0	59	100.0
Team 11	102	1	0	100.0	103	99.0
Team 12	61	0	0	100.0	61	100.0
Team 13	56	0	1	100.0	57	98.2
Team 14	92	0	0	100.0	92	100.0
Team 15	86	0	2	100.0	88	97.7
Team 16	104	0	0	100.0	104	100.0
Team 17	87	1	0	100.0	88	98.9
Team 18	106	0	0	100.0	106	100.0
Team 19	49	0	0	100.0	49	100.0
Team 20	80	0	0	100.0	80	100.0
Team 21	75	0	0	100.0	75	100.0
Team 22	74	0	0	100.0	74	100.0
Team 23	99	0	0	100.0	99	100.0
All teams	1,740	3	0	100.0	1,749	99.5

[a] The response rate is the percentage of households completed divided by the number with response codes 1 and 5. The target response rate is 95 percent.

Source: Feed the Future Bangladesh ZOI Survey, 2018/2019.

APPENDIX 4. ABBREVIATED WOMEN'S EMPOWERMENT IN AGRICULTURE INDEX ADEQUACY CRITERIA AND FACT SHEET

A4.1 Criteria for achieving adequacy for A-WEAI indicators

Table A4.1.1 presents the Women's Empowerment in Agriculture Index's five domains of empowerment, their corresponding empowerment indicators, the survey questions that are used to elicit the data required to establish adequacy or inadequacy for each empowerment indicator, their corresponding variables in the Feed the Future Bangladesh Zone of Influence (ZOI) Survey 2018/2019 dataset, and how adequacy criteria are defined for each empowerment indicator. For additional details, please refer to the *Guide to Feed the Future Statistics*.[82]

[82] Zalisk, Dupuis, Gauthier, Kaur, Khan, Swindale, and Johnson (2019)

Table A4.1.1: Women's Empowerment in Agriculture Five Dimensions of Empowerment: Domains, Indicators, ZOI Survey Questions and Variables, Adequacy and Inadequacy Criteria, and Weights

Domain	Indicator name	Survey questions	ZOI Survey (2018-2019) Questions	ZOI Survey (2018-2019) Variables	Adequacy criteria	Inadequacy criteria	Weight
Decision-making over production	Indicator 1.1: Input in productive decisions	"When decisions are made regarding food crop farming, cash crop farming, livestock raising, and fishing or fishpond culture, who is it that normally takes the decision?" "How much input did you have in making decisions about food crop farming, cash crop farming, livestock raising, and fishing or fishpond culture?" "To what extent do you feel you can make your own decisions regarding these aspects of household life if you want(ed) to: food crop farming, cash crop farming, livestock raising, and fishing or fishpond culture if you wanted to?"	Q.6202 (a, b, c, f) Q.6203 (a, b, c, f) Q.6204 (a, b, c, f)	v6202_01–v6202_03, v6202_06 v6202_01–v6202_03, v6202_06 v6202_01–v6202_03, v6202_06	For at least one activity: decides alone; OR participates and has input into some; or most or all decisions regarding the activity; OR someone else decides but feels could decide to a medium or high extent if wanted to	Participates but does not have input into some; or most or all decisions regarding the activity; OR does not make the decision NOR feels he or she could to a medium or high extent (93 "no decision made" coded as missing)	1/5

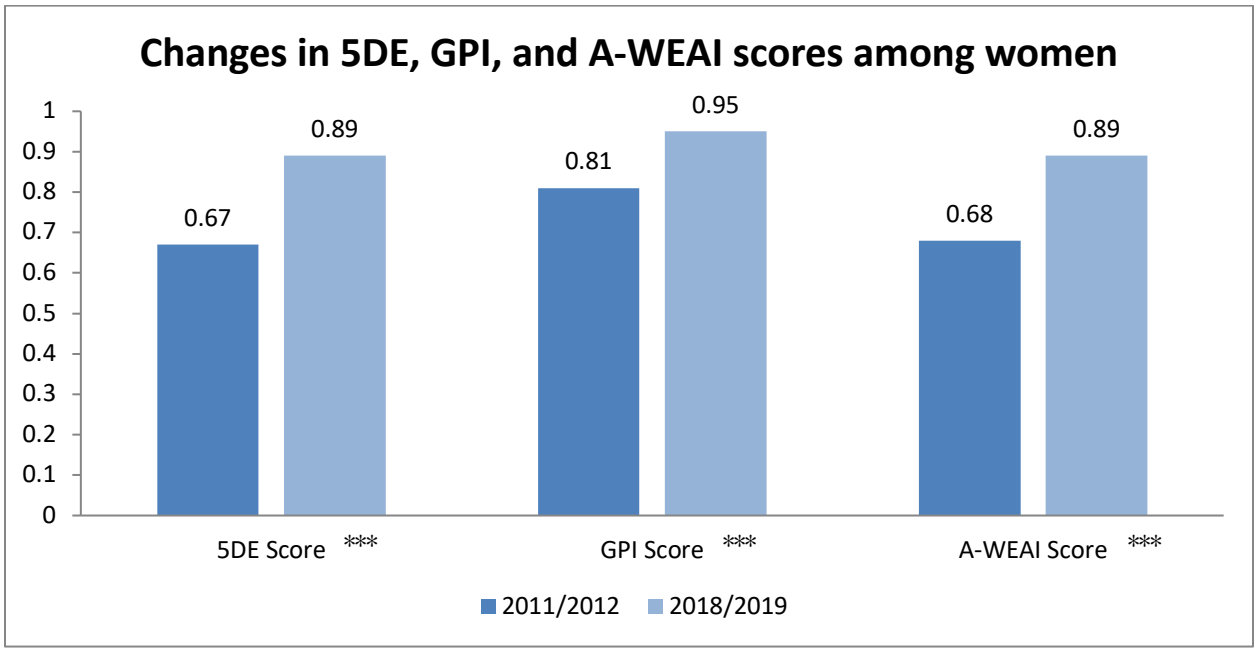
Access to resources	Indicator 2.1: Ownership of assets	"Does anyone in your household currently have any [ITEM]?: agricultural land, large livestock, small livestock, chickens/ducks/turkeys/ pigeons, fishpond or fishing equipment, hand tools, non-mechanized farm equipment, mechanized farm equipment, non-farm business equipment, house, large consumer durable goods, small consumer durable goods, cell phone, other land or structures, and means of transportation?" "Do you own any of the item either by yourself or jointly with someone else?"	Q.6301a–Q.6301n Q.6303a–Q.6303n	v6301_01–v6301_15 v6303_01–v6303_15	Owns—alone or jointly—at least one large asset or two types of small assets (small assets are chickens/ducks/ turkeys/pigeons, hand tools, non-mechanized farm equipment, and small consumer durable goods)	Does not own any assets; OR owns only one type of small asset alone or jointly	2/15
	Indicator 2.2: Access to and decisions over credit	"Has anyone in your household taken any loans or borrowed cash/in-kind from [SOURCE] in the past 12 months?: NGO, informal lender, formal lender, friends or relatives, group-based micro-finance or lending (savings/credit group), informal credit/savings groups such as merry-go-rounds, tontines, funeral societies, etc." "Who made the decision to borrow from [SOURCE]?" "Who makes the decision about what to do with the money/item borrowed from [SOURCE]?"	Q.6308a–Q.6308f Q.6309a–Q.6309f Q.6310a–Q.6310f	v6308_1–v6303_6 v6309_1–v6309_6 v6310_1–v6310_6	Can alone or jointly make at least one decision regarding at least one source of credit	Household has no credit; OR household has credit but respondent did not participate in any decision about it	1/15
Control over	Indicator 3: Control of use	"How much input did you have in decisions on the use of income	Q.6205a–Q.6205f	v6205_01–v6206_03, v6206_06	Has input into some; or most or	Participates in activity but has no	1/5

income	of income	generated from food crop farming, cash crop farming, livestock raising, non-farm economic activities, wage and salary employment, and fishing or fishpond culture?" "To what extent do you feel you can make your own personal decisions regarding these aspects of household life if you want(ed) to?: non-farm activities, own wage and salary employment, major household expenditures"	Q.6204d, Q.6204e, Q.6204g	v6204_04, v6204_05, v6204_07	all decisions on use of income for at least one productive/ economic activity; OR feels can make decisions to medium or high extent if respondent wanted for at least one income or expenditure decision—excludes minor household expenditures	input in decisions about income, OR feels she or he has no or very little input into the decision regarding income from non-farm activities, wage and salary employment, or decisions regarding major household expenditures even if she or he wanted to	
Group member-ship and leadership	Indicator 4.1: Membership in economic or social group	"Are you an active member of an agricultural/livestock/fisheries producers' group, waters users' group, forest users' group, credit/micro-finance group, mutual help/insurance group, trade and business association, trade and business association, civic groups, local government, religious group, other women's/men's group, or any other formal or informal organization?"	Q.6405a–Q.6405k	v6405_01–v6405_11	Is an active member of at least one group	Is not an active member of at least one group	1/5
Time allocation	Indicator 5.1: Workload	The survey collected information on respondents' time allocation for a 24-hour period. Information was collected for primary activities and reported in 15-minute intervals.	Q.6601	v6601p_15_[hour], v6601p_30_[hour], v6601p_45_[hour], v6601p_60_[hour] where [hour] is a value 1–24	Works less than or equal to 10.5 hours in 24-hour period	Works more than 10.5 hours in 24-hour period	1/5

A4.2 Bangladesh Abbreviated Women's Empowerment in Agriculture Index data fact sheet

Bangladesh

Feed the Future Phase One 2011/2012 baseline – 2018/2019 endline Abbreviated Women's Empowerment in Agriculture Index results



Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.

Note: The asterisk signs beside the vertical legends are indicating significance level of the differences between 2011/12 and 2018/19. * p<0.05, ** p<0.01, *** p<0.001.

Key findings

Bangladeshi women in the Feed the Future Zone of Influence experienced significant increases in empowerment from 2011/2012 baseline to 2018/2019 endline:

- The A-WEAI score improved from 0.68 to 0.89.
- The 5DE score increased from 0.67 to 0.89.
- The GPI score increased from 0.81 to 0.95.
- At endline, ownership of assets, control over income and input in productive decisions were identified as top contributors to empowerment for women and men.
- At endline, women and men reported the same top three contributors to disempowerment: access to and decisions on credit, group membership, and workload.

- The proportion of women with adequacy in group membership, ownership of assets, access to and decisions on credit and input in productive decisions experienced substantial gains.
- Various Feed the Future implementing partners have used WEAI data from the BIHS 2011/2012 and 2018/2019 surveys to inform the design and implementation of their activities to enhance empowerment in the ZOI. A-WEAI results have also been used to design the Agriculture, Nutrition and Gender Linkages (ANGeL) pilot project (2015-2018) in Bangladesh, which recognizes the importance of women's empowerment and its relationship to agriculture-income-nutrition pathways. The program has been adopted by the Ministry of Agriculture of Bangladesh, and is now being scaled up at the national level.

Sample

The A-WEAI sample is from a longitudinal study, where mostly the same households from BIHS 2011/2012 baseline were interviewed during the 2015 midline and 2018/2019 endline surveys. The data are representative of the Feed the Future ZOI, comprising of 2,040 households at baseline and 2,064 households at endline. The 2011/2012 baseline survey in the Feed the Future ZOI took place between October and November 2011, and the endline survey in the Feed the Future ZOI took place between November 2018 and February 2019.

A-WEAI score

The A-WEAI score increased from 0.68 to 0.89 from 2011/2012 baseline to 2018/2019 endline in the Feed the Future ZOI. It is a weighted average of the Five Domains of Empowerment (5DE) and Gender Parity Index (GPI) scores. This represents a 30.9 percent increase from the baseline score in 2011, illustrating that Bangladeshi women in the Feed the Future ZOI are becoming more empowered.

5DE score

At 2011/2012 baseline, the 5DE score was 0.67, which increased to 0.89 at 2018/2019 endline, demonstrating a 32.8 percent increase. The percentage of women achieving empowerment increased from 30.5 percent to 68.7 percent. Average adequacy scores among disempowered women also increased considerably, from 51.9 percent at baseline to 64.0 percent at endline.

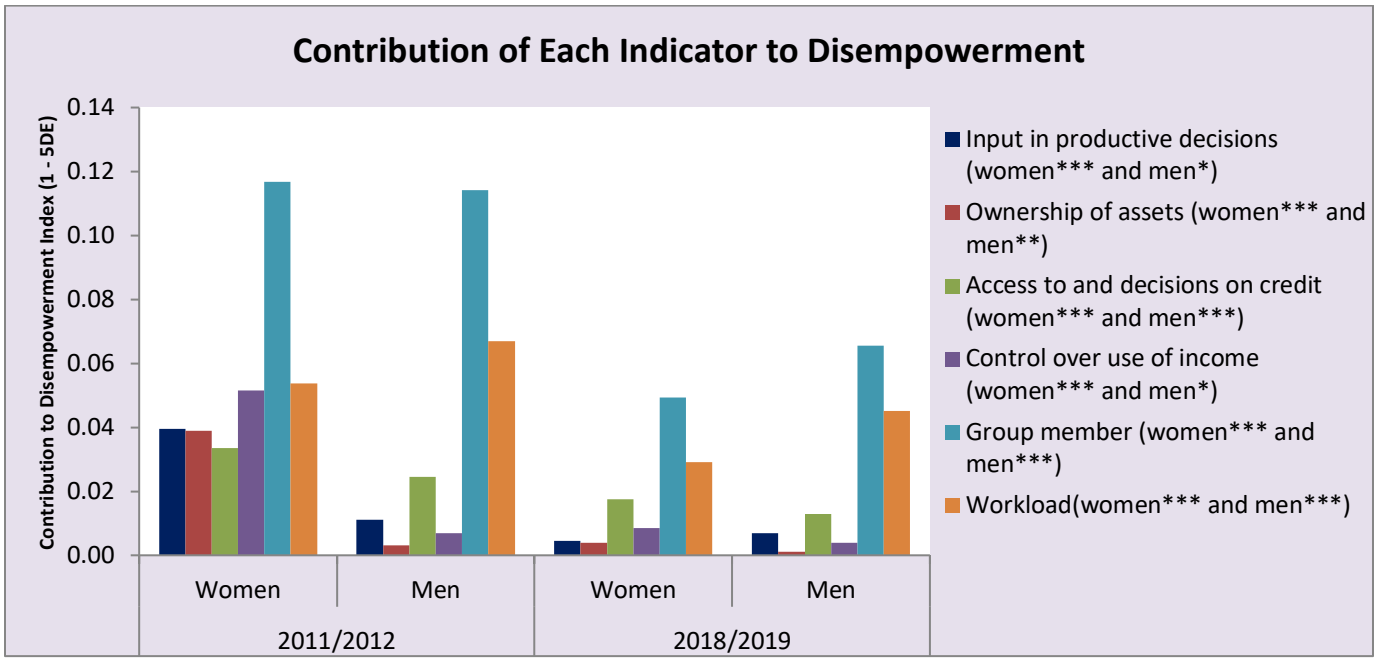
GPI score

The GPI score increased from 0.81 to 0.95 between 2011/2012 baseline to 2018/2019 endline. The percentage of women achieving gender parity increased from 49.6 percent to 78.5 percent between baseline and endline. For the 50.4 percent of women at baseline and 21.5 percent women at endline who do not have gender parity, the empowerment gap between the primary female and primary male decision-maker in the household decreased from 37 percent to 22 percent. These changes indicate that gender parity in dual-adult households in the Feed the Future ZOI is improving over time.

Top contributors to disempowerment

Although men were more empowered than women at baseline (39.7 percent versus 30.5 percent, respectively), women are now more empowered than men: at endline, 68.1 percent of women are

empowered compared with 63.2 percent of men who achieved empowerment. The disempowerment Index (1 – 5DE) decreased from 0.33 to 0.11 between 2011/2012 baseline and 2018/2019 endline, respectively, for women. On the other hand, the disempowerment index for men decreased from 0.23 to 0.14 between baseline and endline for men.



Source: Feed the Future Bangladesh ZOI Survey, 2011/2012 and 2018/2019.
Note: The asterisk signs beside the vertical legends are indicating significance level of the differences between 2011/12 and 2018/19. * p<0.05, ** p<0.01, *** p<0.001.

The chart above shows the contribution of each of the six indicators to disempowerment for women and men, at baseline and endline. Lack of group membership and high workload remain the top two contributors of disempowerment for men between baseline and endline. At baseline, the top contributors to disempowerment for women were lack of group membership, high workload and poor control over use of income. At endline, while lack of group membership and high workload still remain as top contributors to disempowerment, women have experienced improvements in the control over use of income domain.

A-WEAI application in programming

A-WEAI and WEAI have informed policy and programming in Bangladesh. Key highlights include that various Feed the Future implementing partners have used A-WEAI and WEAI to evaluate program impacts on empowerment; IFPRI and USAID tested a modified WEAI to measure empowerment along the agricultural value chain; and A-WEAI data were collected under an IFPRI-designed, government-led program, "Agriculture, Nutrition, and Gender Linkages" (ANGeL), which is now being scaled up nationwide.

A-WEAI research

USAID, IFPRI, and the Oxford Poverty & Human Development Initiative developed the WEAI in 2012 as a tool to reflect changes in women's empowerment that might result from the U.S. Government's Feed the Future initiative. Bangladesh emerged as the first country that collected A-WEAI and WEAI data under the BIHS 2011/2012 first round, which were representative nationally of rural Bangladesh and of the USAID Feed the Future stratum.

In 2017, IFPRI and USAID tested a modified WEAI to measure empowerment along the agricultural value chain, known as the Women's Empowerment in Agriculture Index for Value Chains. This pilot study helped identify challenges of and solutions for empowering wage earners and entrepreneurs in agriculture.[83]

In 2016-2018, IFPRI designed and evaluated a randomized controlled trial, the "Agriculture, Nutrition, and Gender Linkages" (ANGeL) pilot project, which was implemented by the Bangladesh Ministry of Agriculture to assess which interventions are most effective at diversifying agriculture, diets, and empowering women. The RCT compared five interventions: (1) nutrition by government agricultural extension agents (AEAs); (2) nutrition by community nutrition workers; (3) agriculture, on production of nutrient-rich foods by AEAs; (4) agriculture and nutrition by AEAs; and (5) agriculture and nutrition by AEAs, and gender sensitization training by project facilitators hired by Helen Keller International.

The A-WEAI findings from the ANGeL study revealed that women's empowerment significantly improved across all interventions, but the improvement was significantly larger when agriculture production, nutrition, and gender sensitization trainings targeting men and women in farm households were combined. Moreover, several ANGeL interventions improved men's attitudes around gender roles, with larger improvements when participants receive gender sensitization training. There were no significant increases in men's empowerment, but also no significant decreases, suggesting that gains for women were not achieved at the expense of men in this context. Motivated by this positive research-based evidence, the Government of Bangladesh is scaling up the most effective ANGeL interventions nationally.

[83] Ahmed et al. (2018)