FEED THE FUTURE

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

Feed the Future Ethiopia

Zone of Influence End-line Assessment Report 2018

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FROM THE AMERICAN PEOPLE

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Table of Contents

List of Tables

List of Figures

List of Acronyms

5DE	Five Domains of Empowerment
A-WEAI	Abbreviated Women's Empowerment in Agriculture Index
BFS	Bureau for Food Security
BMI	body mass index
CI	confidence interval
CPI	Consumer Price Index
DEFF	design effect
DHS	Demographic and Health Survey
EA	Enumeration area
FTFMS	Feed the Future Monitoring System
GPI	Gender Parity Index
HHS	Household Hunger Scale
IFPRI	International Food Policy Research Institute
LCU	local currency unit
LSMS	Living Standards Measurement Survey
M&E	monitoring and evaluation
MAD	minimum acceptable diet
MDD-W	Women's Minimum Dietary Diversity
MDG	Millennium Development Goal
PBS	population-based survey
P1-ZOI	Phase One Zone of Influence
PPP	purchasing power parity
PPS	probability proportional to size
SD	standard deviation
SDG	Sustainable Development Goals
UNDP	United Nations Development Program
UNICEF	United Nations Children's Emergency Fund
USAID	United States Agency for International Development
USD	United States Dollar
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 reduce poverty, hunger and undernutrition among women and children, and to increase income, resilience, women's empowerment, dietary diversity and appropriate feeding practices, and hygienic environments. 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.

This assessment reports Feed the Future's population-based phase one indicators from the Feed the Future Ethiopia Zone of Influence (ZOI) Survey 2018. The 2018 survey serves as the end-line survey for phase one of Feed the Future. The assessment compares indicator estimates and selected demographic and household characteristics from the 2018 ZOI Survey with those obtained from the baseline survey conducted in 2013 to assess trends and to test for statistically significant differences between the two time periods in the phase one ZOI (P1-ZOI) in Ethiopia. The assessment includes only Feed the Future phase one indicators that were reported at baseline and for which comparable baseline and end-line survey data are available.

The Feed the Future P1-ZOI in Ethiopia includes rural areas in Amhara, Oromia, Tigray, Somali and Southern Nations, Nationalities, and People's (SNNP) regions (see Figure 1.1).

This end-line assessment will provide the United States Government interagency partners, USAID Bureau for Food Security (BFS), USAID Missions, host country governments and development partners with information about long-term progress of the Feed the Future population-based PI-ZOI indicators in Ethiopia. The assessment is designed for use as a monitoring tool, and as such provides indicator point estimates that were generated to have an acceptable level of statistical precision. The assessment is designed to also measure changes in indicator estimates and select demographic and household characteristics from the Feed the Future baseline ZOI Survey, which was conducted in 2013. Feed the Future ZOI Survey sample calculations, however, are not designed to support conclusions of causality or program attribution.

The Feed the Future Ethiopia ZOI Survey 2018 End-line Assessment is a product of the International Food Policy Research Institute (IFPRI), which is responsible for specific elements of performance monitoring and impact evaluation supporting the Feed the Future initiative.

ZOI Survey 2018 Phase One End-line Assessment Indicators

The Feed the Future phase one population-based ZOI indicators included in this assessment are:

1. Daily per capita expenditures (2010 USD)

2. Prevalence of poverty: Percent of people living on less than $1.25/day 2005 PPP
3. Depth of poverty: Mean percent shortfall of the poor relative to the $1.25/day 2005 PPP poverty line
4. Prevalence of moderate and severe hunger
5. Women dietary diversity: Mean number of food groups consumed by women of reproductive age
6. Prevalence of underweight women of reproductive age
7. Prevalence of underweight children under 5 years of age
8. Prevalence of stunted children under 5 years of age
9. Prevalence of wasted children under 5 years of age
10. Prevalence of children 6-23 months receiving a minimum acceptable diet
11. Prevalence of exclusive breastfeeding of children under 6 months of age
12. Women's Empowerment in Agriculture Index (WEAI)

Data for measuring the prevalence of anemia among women of reproductive age and the prevalence of anemia among children 6-59 months and consumption of targeted nutrient-rich value chain commodities were not collected for the Feed the Future Ethiopia ZOI Survey 2018 and therefore are not included in this assessment.

ZOI Survey 2018 Assessment Data Sources

Data for the ZOI indicators presented in this assessment are drawn from two sources: baseline and end-line household surveys conducted in June/July in 2013 and September/October 2018, respectively.

The 2018 Ethiopia ZOI Survey was conducted by International Food Policy Research Institute (IFPRI) in conjunction with its data collection partner, BST Consulting PLC. (BST for short), with some support (enumerator recruitment, logistics and survey equipment) from the Central Statistics Agency (CSA). Fieldwork for the ZOI Survey took place between September and October 2018.

Summary of Key Findings

Household Economic Status

The daily per capita expenditures in the Feed the Future ZOI in 2018 was $2.19 (in 2010 USD) – a level that is statistically significantly higher than the level at the baseline ($1.77). The population that fell below the $1.25/day (2005 PPP) poverty line was 32.3 percent in 2018 and lower than the 39.9 percent recorded in 2013. This decline in the prevalence of poverty is statistically significant. The depth of poverty is estimated at 12.2 percent for 2018 and 13.2 percent for 2013. However, this difference is not statistically significant.

Hunger and Dietary Intake

Prevalence of households with moderate or severe hunger is 3.3 percent in the end-line, and this is statistically significantly lower relative to the prevalence in the baseline, 4.9 percent. The dietary diversity in the ZOI has been and remains low. Nevertheless, there has been considerable improvements during the 2013-2018 period. Women of reproductive age consume from an average of 2.32 food groups in a day in 2018. This is nearly a 50 percent, statistically significant, increase relative to the corresponding figure in 2013 (1.59 food groups). Only 1.84 percent of women achieve the minimum dietary diversity or consume from at least five food groups in the baseline while this number increased to 4.64 percent in the end-line, or by over 150 percent during the 2013-2018 period (Table 5.5). Only 3.4 percent of children 6-23 months old received a minimum acceptable diet in 2013 while the proportion more than doubled to 8.4 percent in 2018. Both of these changes are statistically significant. Prevalence of exclusive breastfeeding among children under 6 months of age is stayed high in Ethiopia at about 74 percent in 2018 with little change during the period.

Nutritional Status of Women and Children

Nearly 22 percent of women of reproductive age are underweight in 2018, and this is statistically significantly lower than the 26 percent in 2013. The prevalence of severely underweight women declined even more considerably, by nearly 40 percent, from 3.8 percent in 2013 to 2.3 percent in 2018. Prevalence of stunting among children under 5 years of age was about 39 percent in 2018, which, relative to the 50.3 percent in 2013, was 23 percent lower. The prevalence of wasting among children under 5 years of age declined by 31 percent from over 14 percent in 2013 to 9.7 percent in 2018. Similarly, the proportion of underweight children declined from 31.5 percent in 2013 to 22.5 percent in 2018. The changes reported for all three child anthropometric measures are statistically significant.

Women's Empowerment in Agriculture

Women's empowerment is measured through the full Women Empowerment in Agricultural Index (WEAI). In 2018, the WEAI for the ZOI in Ethiopia is estimated as 0.75 and did not change

significantly from 2013. Access to and input into decisions on credit is a major constraint to women's empowerment. Lack of leisure time, group membership and speaking in public are also among important contributors to women's disempowerment.

Baseline and end-line estimates of indicator values in the ZOI are shown in Table ES1 below. The main takeaway from the table is that most indicators are improving and some considerably. Further analysis is in subsequent chapters.

Table ES1: Feed the Future PI-ZOI indicator estimates, by key disaggregates: Ethiopia 2013-2018

	Baseline (2013)			End-line (2018)				p-	
Indicator	**Est.**	**95% CI**	**n[a]**	**Est.**	**95% CI**	**n[a]**	**Diff.**	**value[b]**	**Sig.[c]**
Mean daily per capita consumption expenditure in constant 2010 USD (2005 PPP)									
All households	1.77	1.70-1.84	4,618	2.19	2.10-2.27	3,876	0.42	0.000	***
Gendered household type									
Male and female adults	1.73	1.65-1.81	3,534	2.21	2.12-2.31	3,089	0.48	0.000	***
Female adults only	1.89	1.74-1.99	855	1.95	1.79-2.11	665	0.08	0.383	n/s
Male adults only	2.35	2.06-2.63	224	2.05	1.53-2.56	115	-0.35	0.250	n/s
Children only	^	^	2	^	^	7	^	^	^
Prevalence of poverty: Percentage of people living on less than $1.25/day (2005 PPP)									
All households	39.9	38.5-41.4	4618	32.3	30.8-33.8	3,876	-7.6	0.000	***
Gendered household type									
Male and female adults	40.4	38.8-42.0	3,534	31.3	29.6-32.9	3,089	-9.1	0.000	***
Female adults only	38.9	35.6-42.2	855	40.8	37.1-44.6	665	1.9	0.504	n/s
Male adults only	31	24.9-37.1	224	36.3	27.3-45.1	115	5.3	0.445	n/s
Children only	^	^	2	^	^	7	^	^	^
Depth of poverty: Mean percent shortfall relative to the $1.25/day poverty line (2005 PPP)									
All households	13.2	12.6-13.8	4,618	12.2	11.4-12.8	3,876	-1.0	0.054	n/s
Gendered household type									
Male and female adults	13.3	12.6-14.0	3,534	11.7	10.9-12.5	3,089	-1.6	0.010	*
Female adults only	13.2	11.7-14.6	855	15.8	13.9-17.6	665	2.6	0.058	n/s
Male adults only	9.7	7.3-12.1	224	12.5	8.5-16.4	115	2.8	0.279	n/s
Children only	^	^	2	^	^	7	^	^	^
Women's Empowerment in Agriculture Index[d]									
All women	0.702	0.69-0.72	3265	0.750	0.75-0.76	3047	0.052	0.000	***
Woman's age									
18-29 years	0.705	0.68-0.71	1194	0.720	0.72-0.73	612	0.015	0.000	***
30 years or older	0.690	0.69-0.72	2071	0.760	0.76-0.77	2435	0.066	0.000	***
Prevalence of moderate and severe hunger									
All households	4.9	3.8-6.2	4,224	3.3	2.6-4.2	3,888	-1.6	0.014	*
Gendered household type									
Male and female adults	3.7	2.8-5.0	3,235	2.5	1.9-3.3	3,105	-1.2	*	*
Female adults only	9.2	7.0-12.1	776	6.8	5.0-9.3	661	-2.4	n/s	n/s
Male adults only	7.0	4.0-11.8	209	6.6	3.1-13.4	116	-0.4	n/s	n/s
Children only	^	^	4	^	^	6	^	^	^

Women's dietary diversity: Mean number of food groups consumed by women of reproductive age[e]									
All women 15-49 years of age	1.59	1.5-1.7	3,978	2.32	2.2-2.4	3,956	0.8	0.000	***
Prevalence of exclusive breastfeeding among children under 6 months of age[e]									
All children	72.2	65.2-78.3	204	74.5	63.5-83.0	111	2,3	0.709	n/s
Child's sex									
Male	71.5	61.5-79.7	96	73.9	58.9-84.8	57	2.4	0.778	n/s
Female	72.9	62.2-81.4	108	75.1	62.0-84.8	54	2.2	0.769	n/s
Prevalence of children 6-23 months of age receiving a minimum acceptable diet[e]									
All children	3.4	2.0 - 5.7	633	8.4	6.4-11.0	639	5.0	0.003	**
Child's sex									
Male	3.5	1.6 -7.6	328	7.5	5.0-11.1	324	4.0	0.081	n/s
Female	3.3	1.7 -6.4	305	9.3	6.4-13.1	315	6.0	0.007	**
Prevalence of underweight women of reproductive age[e]									
All non-pregnant women 15-49 years of age	26.0	23.8-28.3	3,517	21.9	19.9-24.0	3,604	-4.1	0.002	**
Prevalence of stunted children under 5 years of age[e]									
All children	50.3	47.2-53.5	1,553	38.9	36.1-41.8	1,963	-11.4	0.000	***
Child's sex									
Male	52.9	48.7-57.1	778	38.8	34.9-42.8	976	-14.1	0.000	***
Female	47.7	43.6-51.8	775	39	35.8-42.3	987	-8.7	0.001	**
Prevalence of wasted children under 5 years of age[e]									
All children	14.1	11.9-16.6	1,471	9.7	7.8-12.0	1,916	-4.4	0.010	**
Child's sex									
Male	14.3	11.8-17.3	733	11.0	8.7-13.9	950	-3.3	0.101	n/s
Female	13.9	11.1-17.2	738	8.4	6.3-11.2	966	-5.5	0.007	**
Prevalence of underweight children under 5 years of age[e]									
All children	31.5	28.6-34.6	2,102	22.5	20.5-24.6	2,153	-9	0.000	***
Child's sex									
Male	32.2	29.1-35.3	1,050	23.9	21.2-26.7	1,071	-8.3	0.000	***
Female	30.9	26.9-32.3	1,052	21.1	18.7-23.7	1,082	-9.8	0.000	***

Est.=estimate, n/a=not available, CI=confidence interval

^ 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 end-line estimates at the overall indicator level. .

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

[d] The full Women's Empowerment in Agriculture Index (WEAI) was calculated at baseline and end-line.

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

Notes:

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

Estimates are based on de jure household members, except where noted.

Sources: Feed the Future Ethiopia ZOI Survey 2013; Feed the Future Ethiopia ZOI Survey 2018.

1. Background

This chapter provides background information on Feed the Future in Ethiopia, including a description of the program and the Feed the Future phase one Zone of Influence (P1-ZOI), demographic information on the P1-ZOI population and a summary of the agriculture situation in the P1-ZOI.

1.1 Feed the Future Overview

Feed the Future is a major United States Government program that aims to address the root causes of global hunger by sustainably increasing agricultural productivity to meet the demand for food, supporting and facilitating access to markets, and increasing incomes for the rural poor so they can meet their food and other needs, including reducing malnutrition. Ethiopia has been designated a priority country for the Feed the Future Initiative. It is within this context that USAID Mission Ethiopia has developed an approved Feed the Future strategy, which is being implemented by a host of implementing partners.

The Feed the Future program requires each USAID Feed the Future Mission to focus and concentrate its efforts in a defined area of coverage – the Zone of Influence (ZOI) – in order to measure impact. The ZOI for USAID Mission Ethiopia comprises the 149 woredas where the Feed the Future projects are implemented over the 5 years period of 2013-2017 (see Figure 1.1 below). As part of its Feed the Future strategy, USAID has made a strong commitment to timely and high-quality assessments aimed at providing information and analysis that prevents mistakes from being repeated; and increases the possibility that future investments will yield even more benefits than previous investments. As part of this commitment, each USAID Mission is required to conduct a Population Based Survey (PBS) across its ZOI.

1.2 Feed the Future P1-ZOI Profile

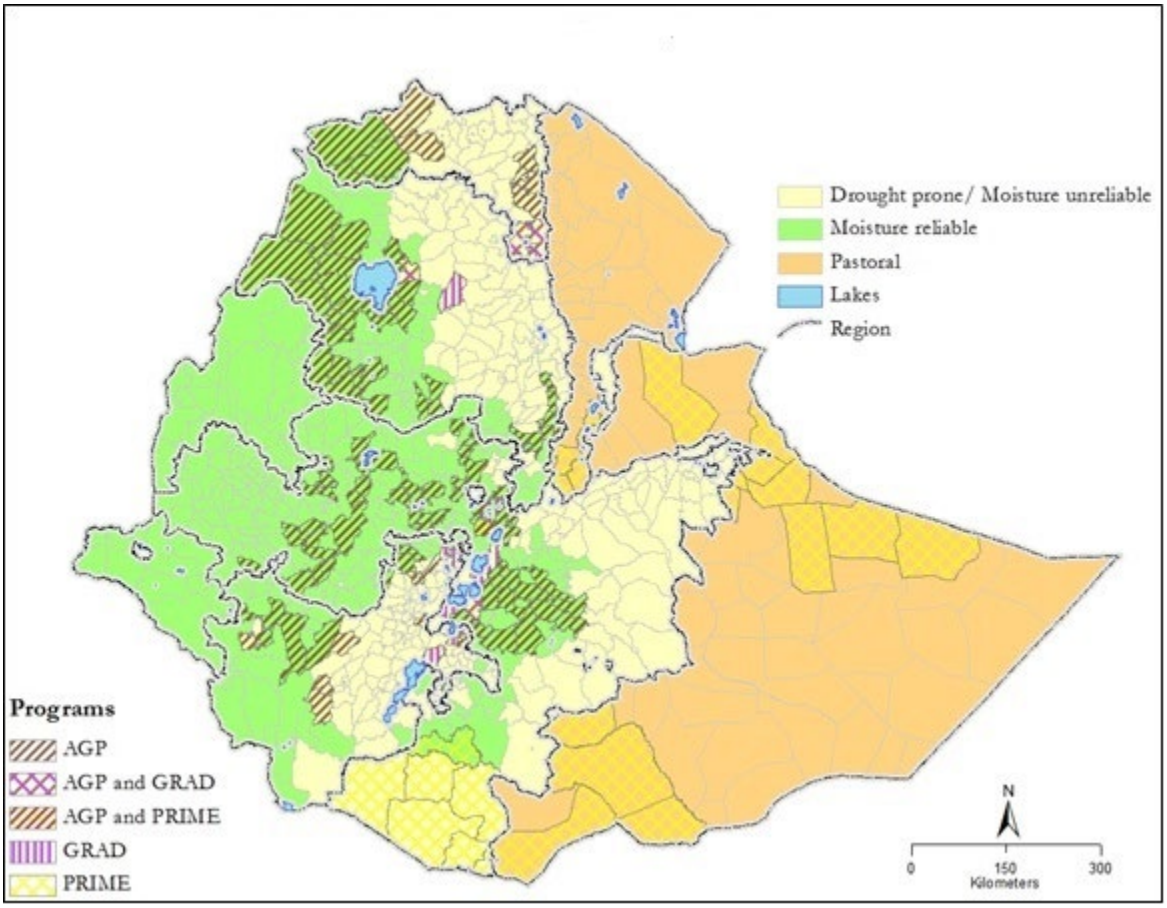
The geographic focus of the Feed the Future Ethiopia ZOI Survey 2018 data collection for the phase one end-line analysis is the P1-ZOI—the geographic area where the Feed the Future program is expected to have an impact on hunger, poverty and nutrition during phase one of the program. The P1-ZOI geographic area has not changed since the baseline survey in 2013. However, the Feed the Future Ethiopia ZOI Survey 2018 could not be fielded in the five woredas of Somali region due to the instability in the region during the period leading up to and including the end-line survey.

The ZOI in Ethiopia consists only rural households in five regions: Amhara, Oromia, Tigray, Somali and Southern Nations, Nationalities, and People's region. The total population in the Feed the Future ZOI is 17.5 million individuals, residing in 4.1 million households in 2018 (not including the Somali sub-population due to the difficulty of conducting the PBS in that region during the

end-line). In terms of the agro-ecological zones, Feed the Future in Ethiopia operates in "drought prone," "moisture reliable" and "pastoral" areas (Figure 1.1).

A map of the Feed the Future P1-ZOI in Ethiopia is provided in Figure 1.1. The five program areas identified on the map together constitute the P1-ZOI.

Figure 1.1. Map of Ethiopia: Feed the Future P1-ZOI



Note: AGP = Agricultural Growth Program, GRAD = Graduation with Resilience to Achieve Sustainable Development, PRIME = Pastoralist Areas Resilience Improvement through Market Expansion

1.2.1 Rationale for P1-ZOI Selection

To define the ZOI, Feed the Future Ethiopia selected woredas that are conducive for agricultural growth (e.g. AGP activities), where investments create a "pull" factor, or those characterized by high levels of chronic food insecurity and/or pastoralist areas, where market components create a "push" factor.

1.2.2 Demography of the P1-ZOI

Tables 1.1 and 1.2 present individual and household population estimates, respectively, for the P1-ZOI in 2018 based on the panel PBS conducted in 2018 by International Food Policy Research Institute (IFPRI) in conjunction with BST Consulting PLC., with some support from the Central Statistics Agency. Estimates of the total population as well as sub-populations of the ZOI are presented. The sub-population categories correspond to the various sub-populations for the Feed the Future indicators and disaggregates. The ZOI estimates for the total population of individuals as well as households are also disaggregated by gendered household type.[1]

First, a brief note on how the 2018 population estimates and disaggregates were obtained. The baseline population and sub-populations were estimated using the sample survey and the sample weights derived from the population census and the complete listing of households in each surveyed enumeration area (EA). In short, the sample levels were inflated by the inverse of the selection probabilities for each EA as inflation factors (or weights). Given a panel sample, the same procedure cannot be followed for the end-line for three reasons – attrition, demographic changes in sample households (marriages, divorces, age profile, etc.), and population growth. These changes make the sample less representative of the population given the passage of 5 years between the baseline and the end-line. It is thus necessary to use a different procedure to estimate the ZOI's population in 2018.

Recall that population growth by gendered household types or other demographic categories of Tables 1.1-1.2 are not available from the Census. The simplest and most feasible approach is thus followed. The common national population growth rates for the 2014-2018 period provide the basic ingredient for the estimation. The growth rates were computed from CSA's medium variant of projections (2008-2037) based on its Intercensal Population Survey of 2012 (2.46 percent, 2.41 percent, 2.36 percent, 2.31 percent, and 2.28 percent per year, respectively, for 2014-2018). These growth rates were used to go from the 2013 population to the 2018 population with the assumption that the average household size remains the same during the period. The same procedure is used for estimation of the population of households. The resulting estimates are reported in the Tables 1.1 and 1.2 below.

In this regard, it is important to keep in mind the limits to the representativeness of the sample noted above. This is particularly critical in making direct comparisons across baseline and end-line using data in Tables1.1 and 1.2.

In 2018, the total ZOI population (excluding the Somali Feed the Future woredas) is estimated to be nearly 17.5 million individuals in 4.1 million households, all residing in rural areas of Ethiopia. More than 88 percent of the people in ZOI reside in households that contain both male and

[1] See Section 2.2.1 Standard Disaggregates for the definition of gendered household type.

female adults. Moreover, the ZOI consists about 1.7 million children who are less than 5 years of age and nearly 3.2 million women of reproductive age.

Table 1.1: Population of Individuals in the PI-ZOI, by Category, Ethiopia 2013-2018

Category of individuals	Baseline (2013)		End-line (2018)	
	N[a]	Percent	N[a]	Percent
Total number of individuals	15,563,872	100	17,489,900	100
Total number of individuals, by key sub-population				
Children 0-5 months	162,689	1.0	86,651	0.5
Children 0-23 months	672,018	4.3	588,691	3.4
Children 6-23 months	509,329	3.3	502,040	2.9
Children 0-59 months	1,993,095	12.8	1,714,885	9.8
Youth 15-29 years	3,990,272	25.6	3,964,116	22.7
Women of reproductive age	3,285,838	21.1	3,151,115	18.0
Primary adult female	2,679,107	17.2	2,518,136	14.4
Total number of individuals, by residence[b]				
Urban	n/a	n/a	n/a	n/a
Rural	15,563,872	100	17,489,900	100
Total number of individuals, by gendered household type				
Male and female adults	13,198,163	84.8	15,496,051	88.6
Female adults only	1,914,356	12.3	1,703,516	9.7
Male adults only	435,788	2.8	265,846	1.5
Children only	^	^	^	^
Children 0-5 months, by sex				
Male	76,045	0.5	43,492	0.2
Female	86,644	0.6	43,159	0.2
Children 0-23 months, by sex				
Male	336,971	2.2	299,045	1.7
Female	335,047	2.2	289,646	1.7
Children 6-23 months, by sex				
Male	260,926	1.7	255,553	1.5
Female	248,403	1.6	246,487	1.4
Children 0-59 months, by sex				
Male	982,706	6.3	859,163	4.9
Female	1,010,390	6.5	855,722	4.9
Youth 15-29 years, by sex				
Male	1,988,576	12.8	2,127,707	12.2
Female	2,001,695	12.9	1,836,407	10.5
Women of reproductive age, by pregnancy status[c]				
Pregnant	306,339	2.0	267,634	1.5
Non-pregnant	2,809,145	18.0	2,828,049	16.2
Primary adult female decision-makers, by age				
18-29 years	965,494	6.2	502,276	2.9
30 years or older	1,722,013	11.1	2,032,593	11.6

Source: Feed the Future Base line Survey of Ethiopia, 2013; Feed the Future End-line Survey of Ethiopia, 2018.

^ Results not statistically reliable, n<30.

[a] Number of individuals in the population

[b] The urban/rural disaggregate uses the Ethiopia-specific definition of urban and rural reflected in the sampling frame at the time the sample was drawn.

[C] The number of pregnant and non-pregnant women of reproductive age do not sum up to the total number because 0.1 percent did not know their pregnancy status and 1 percent did not want to reply in 2013. The respective numbers were 0.1 and 0.3 percent in 2018.

Note: Population growth rates from CSA's intercensal projections.

Table 1.2. Number of households, by category, in the P1-ZOI, Ethiopia 2018

Category of households	End-line (2018)	
	Percent[a]	N
Total number of households	**100**	**4,099,092**
Male and female adults	79.8	3,272,715
Female adults only	17.1	702,584
Male adults only	2.8	116,414
Children only	^	^
Urban	-	-
Rural	100	4,099,092
Tigray	6.2	253,734
Amhara	32.9	1,346,552
Oromiya	40.4	1,654,394
SNNP	20.6	844,413

Source: Feed the Future End-line Survey of Ethiopia, 2018.

^ Results not statistically reliable, n<30.

Note: Regional population growth rates were from CSA's intercensal projections.

1.2.3 Agriculture in the P1-ZOI

The ZOI in Ethiopia is large and agro-climatic conditions vary enormously. The four main regions, Amhara, Oromia, Tigray and SNNP, are mostly located in the highlands (with relatively large fractions of Oromiya and SNNP in the lowlands). In contrast, the Somali region is in the lowlands.

Agriculture in the ZOI is largely rainfed. While most areas rely on only one rainy season (*meher*), some areas in the country cultivate in two rainy seasons (*meher* and *belg*).

An average household in the ZOI cultivated about a hectare of land. This average masks the considerable heterogeneity in landholding sizes across the ZOI. About 96 percent of the households in the ZOI practice crop-agriculture. Crop-agriculture in Ethiopia is heavily focused on cereal production with the five most important cereals being teff, barley, wheat, maize and sorghum. Coffee is the most important non-teff cash crop. The southern part of the country also cultivates enset that forms an important part of the diet in that area.

About 88 percent of all households in the ZOI own livestock. The average household owns about 4.7 Tropical Livestock Units (TLU). The major risks and constraints that households face in livestock production are water shortages, livestock diseases and lack of grazing land.

With regard to marketing of crop output, livestock and livestock products in the Feed the Future ZOI, more than half of the sample households in 2018 sold part of their produced crop output

with notable differences across various crop categories. The percentage of households who sold livestock and livestock products is around 34 percent and 23 percent, respectively.

1.3 Purpose of this Assessment

The purpose of this assessment is to provide the United States Government interagency partners, USAID/BFS, USAID Missions, host country government and development partners with information to monitor long-term progress of the Feed the Future phase one population-based ZOI indicators. The assessment is designed for use as a monitoring tool, and as such provides indicator point estimates that were generated to have an acceptable level of statistical precision. The assessment is designed to also measure changes in indicator estimates and select demographic and household characteristics from the Feed the Future baseline ZOI Survey, which was conducted in 2013. Feed the Future ZOI Survey sample calculations, however, are not designed to support conclusions of causality or program attribution.

2. Methodologies for Obtaining 2018 Values for Feed the Future Indicators

This chapter describes the methodology used to obtain the Feed the Future population-based ZOI indicators. It provides information on the data sources and describes measures and reporting conventions used throughout the report.

2.1 Data Sources

Data for all the ZOI indicators presented in this assessment are drawn from two sources: Feed the Future baseline and end-line household surveys. As noted elsewhere in the report, these surveys took place June/July 2013 and September/October 2018, respectively.

2.1.1 Primary Data: The Feed the Future Ethiopia ZOI Survey 2018

This section describes the Feed the Future Ethiopia ZOI Survey 2018, including discussion of the sample design and sample size, questionnaire customization, fieldwork, response rates and limitations of the survey. Appendix 2.1 provides additional details on the sampling and weighting methodology.

Survey Sample Design

The Feed the Future Ethiopia ZOI Survey 2018 included a panel of households that were initially selected in the baseline survey of 2013. In other words, the ZOI end-line survey was a panel survey that covered the same households selected at baseline (in 2013) via a multi-stage cluster sampling design.[2] Though it started in 2013 as a representative, random sample of the entire population living in the P1-ZOI, attrition and demographic changes since then made it less representative. Nevertheless, the design ensured that the total sample size included the necessary number of households in the P1-ZOI to assess changes in phase one indicators from the 2013 ZOI Survey to the 2018 ZOI Survey.

At baseline, woredas (or districts) were randomly selected in the first sampling stage from among woredas in the ZOI using proportions derived from population size and Feed the Future-funded project coverage. More specifically, the woreda composition of the sample was made to reflect the distribution of Feed the Future-supported projects by using the percentage of Feed the Future's ZOI (or woredas) each major Feed the Future project covered as a basis of its share in the sample. Three enumeration areas (EAs) were then selected from each woreda using probability proportional to size (PPS) methodology. Finally, households were randomly selected in each EA from a complete list of households prepared specifically for the survey through a

[2] The FTF baseline survey report (Bachewe et al., 2014) describes the sample design and selection in detail. Additional information is also available in section A2.1 below.

complete household listing exercise. The Feed the Future baseline survey report (Bachewe et al., 2014) discusses the considerations and assumptions in the determination of sample size for the Feed the Future baseline.

The Feed the Future Ethiopia ZOI end-line survey conducted in 2018 is a panel survey that followed the same sample households covered by the Feed the Future baseline survey in 2013. Upon USAID's decision that the end-line survey should be restricted to households residing in the Feed the Future ZOI woredas, IFPRI prepared to conduct the Feed the Future end-line survey in those 56 woredas selected at the baseline. However, due to considerable insecurity in the Somali region during the period leading up to the survey, the five woredas in that region could not be covered by the end-line survey. Consequently, the survey covered 51 of the 56 Feed the Future ZI woredas. The issue this raises is discussed in section A2.1 in the annex.

Questionnaire Design

Two questionnaires were developed for the Feed the Future end-line survey. These are the household questionnaire and the community questionnaire.[3]

The core of the household survey instrument consists of the modules found in the standardized survey instrument developed by the Analytics and Learning Division in USAID's Bureau of Resilience and Food Security. These were modified to suit the circumstances in Ethiopia. Additional modules were also included for two primary reasons. First, it is necessary to obtain detailed information on the livelihood characteristics and options of the households and communities in order to capture the context within which Feed the Future investments occur. Second, such data are also required towards answering some of the questions in Feed the Future's Learning Agenda.[4] The household questionnaire's modules are:

a. Household identification cover sheet
b. Household roster and demographics
c. Dwelling characteristics
d. Household consumption expenditure
e. Household hunger scale
f. Women's empowerment in agriculture index
g. Women's anthropometry and dietary diversity
h. Child anthropometry and infant and young child feeding

[3] A copy of the household questionnaire is available as part of the Feed the Future Ethiopia Zone of Influence End-line Survey data asset in USAID's Development Data Library at https://data.usaid.gov/.

[4] Consequently, data collected in some of the additional modules of the household questionnaire as well as data collected via the community survey are not used in this report, which is focused on reporting on Feed the Future's standard indicators.

i. Agricultural productivity and input use
j. Crop utilization
k. Agricultural extension, technology and information networks
l. Livestock ownership and income from livestock and livestock products
m. Shocks and resilience
n. Off-farm income and business activities – own business activities
o. Trust, control and agency
p. Household assets
q. Transfers/gifts

The community questionnaire provides information on community- or Kebele-level resources that will affect take-up of Feed the Future interventions. Modules in the community questionnaire include:

a. Site identification
b. Location and access
c. Water and electricity
d. Services (general)
e. Education and health services
f. Production, marketing and extension
g. Local wages and input costs
h. Current and last year food prices
i. Public works
j. Migration
k. Perceived changes in production and input uses
l. Government of Ethiopia and/or Feed the Future programs/projects operating in the locality or Kebele (e.g., the PSNP, AGP)

The IFPRI team in collaboration with the BST taskforce worked on the preparation of survey instruments based on the generic Feed the Future household questionnaire. Before the actual field work, IFPRI research staff, 56 supervisors from BST and CSA trainers commented on the household questionnaire.

In parallel, the Computer-aided personal interviewing (CAPI) version was developed as an CSPro application or program. The program was put through a series of rigorous tests and modified as necessary. This process continued until the end of the enumerators' training process.

Fieldwork

i. Training

Prior to fieldwork, all field staff were trained on survey procedures, including preparing for fieldwork, questionnaire content, human subjects protection, fieldwork procedures, data management, reporting and communications. Training included hands-on training and practice sessions that covered use of all technical equipment that was used in the survey, as well as a tablet pretest and a survey pilot test.

Training of trainers (all CSA staff participating on their individual capacity) and BST supervisors was conducted during Aug. 8-10, 2018, at the International Livestock Research Institute compound in Addis Ababa. The training was conducted by a team composed of IFPRI and CSA staff (again participating in their individual capacity). This training of trainers (ToT) helped to refine the survey instrument further.

The main training (or training of enumerators) was conducted at the Ethiopian Civil Service University during Aug. 20-Sept. 4, 2018. The enumerators selected for fieldwork at the relevant CSA branches traveled to Addis Ababa during Aug. 17-19, 2018. The training involved going through the substantive aspects of the questionnaires module by module and was based on the CAPI versions of the questionnaires.

Sessions dedicated to anthropometric data collection and data transfer protocols have been part of the training program. This was particularly true of the household questionnaire, which was implemented in digital form. A mock interview at the end of the training helped in reinforcing what was learned during training as well as finding any remaining bugs in the program. All parts of the training were implemented successfully as planned.

The training was completed in 15 days as planned (with a 1-day break for the Arafa Holiday).

ii. Data collection

Data were collected using the two questionnaires described earlier – household and community (with price modules) questionnaires. As noted above, BST had the responsibilty for fielding the survey with IFPRI's leadership. The IFPRI team also traveled to sample sites to assess implementation and help solve unanticipated problems in the field. IFPRI's supervision of survey implementation proved crucial as in previous surveys, particularly for data saving and transfer.

A major task embedded with data collection was data transfer. The digital household data collected using CAPI questionnaire had to be regularly transferred during the data collection period to IFPRI. Three objectives were to be achieved by doing so: to detect and correct collection errors as quickly as possible; to reduce the likelihood of data loss; and to maintain the integrity of the collected data. A purposely designed transfer protocol was adopted. For the most

part data transfer from the field was conducted as planned. However, poor internet connection and remoteness of survey areas resulted in cases in which the data were transferred irregularly.

The planned length of the data collection was 25 days during Sept. 7-Oct. 2, 2018 (with a 1-day break for the Ethiopian New Year). This was achieved in many areas. However, two additional days were required in some woredas due to longer travel time and the use of paper questionnaire. Consequently, the data collection was completed on Oct. 4, 2018.

As planned, all interviewed households were administered the CAPI version of the questionnaire with the exception of Chilga woreda, Amhara region. A number of households in two EAs of that woreda were interviewed using the paper version of the questionnaire. The CAPI version of the questionnaire could not be administered because enumerators were unable to recharge their netbook batteries due to lack of access to electricity. The enumerators latter transferred the paper-based data collected from the households onto the CAPI.

The household data collected using a CAPI-based questionnaire was delivered by BST for IFPRI in the two weeks after the completion of the survey. In contrast, BST completed the entry and basic cleaning of the community data and transferred them to IFPRI on Nov. 23, 2018.

ZOI Survey Response Rates for 2013 and 2018

Table 2.2 presents the response rates for the Feed the Future Ethiopia Survey 2018 in the P1-ZOI. The components and the response rates for the sampled households, women of reproductive age (15-49 years), primary adult male and female decision-makers, and children under 5 years are also presented. The numbers indicate an attrition rate of 8.5 percent or only 8.5 percent of the households selected in 2013 were not surveyed in 2018.

Table 2.2. Comparison of results of household and individual interviews in the PI-ZOI, in total, Feed the Future phase one baseline and end-line ZOI Surveys

Response rate	Baseline (2013)	End-line (2018)
Households		
Number of households selected	4,704	4,251
Number of households occupied	4,635	3,908
Number of households interviewed	4,245	3,890
Household response rate (%)[a]	91.5	99.5
Women of reproductive age (15-49 years)		
Number of eligible women	4,172	4,011
Number of eligible women interviewed	4,172	4,011
Eligible women response rate (%)[b]	100	100
Primary adult female decision-makers (18+ years)		
Number of eligible women	3,466	3,252
Number of eligible women interviewed	3,466	3,252
Eligible women response rate (%)[b]	100	100
Primary adult male decision-makers (18+ years)		
Number of eligible men	2,998	2,527
Number of eligible men interviewed	2,998	2,527
Eligible men response rate (%)[b]	100	100
Children under 5 years of age		
Number of eligible children	2,571	2,209
Number of caregivers of eligible children interviewed	1,956	1,673
Eligible children response rate (%)[b]	100	100
Children under 2 years of age		
Number of eligible children	869	759
Number of caregivers of eligible children interviewed	847	743
Eligible children response rate (%)[b]	100	100

[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.)

Sources: Feed the Future Ethiopia ZOI Survey 2013; Feed the Future Ethiopia ZOI Survey 2018

2.1.2 Comparability of Data Sources Used for the Feed the Future Phase One Baseline and End-line ZOI Survey Assessment

This section discusses the comparability across data sources for the Feed the Future PI-ZOI indicators, and comparability of data sources used for the baseline and end-line surveys.

Seasonality

The Feed the Future Ethiopia ZOI end-line survey was conducted during Sept. 7-Oct. 4, 2018, while the baseline survey was conducted during June 14-July 12, 2013. To ascertain the potential impact of seasonality, it is essential to compare access to food during June/July with September (during which the bulk of the end-line survey took place). The three months fall under the "hunger season," particularly in crop-producing highlands.[5] Also important is the fact that most of the ZOI as well as the sample are located in these highland areas. Outcome variables across the two surveys are thus reasonably comparable.

Table 2.3: Season in which data collection took place for Feed the Future phase one baseline and end-line, by indicator

Indicator	Season of data collection	
	Baseline (2013)	End-line (2018)
Daily per capita expenditures (2010 USD)	June – July	Sept. – Oct.
Prevalence of poverty: Percent of people living on less than $1.25/day (2005 PPP)	June – July	Sept. – Oct.
Depth of poverty: Mean percentage shortfall of the poor relative to the $1.25/day (2005 PPP) poverty line	June – July	Sept. – Oct.
Abbreviated Women's Empowerment in Agriculture Index	June – July	Sept. – Oct.
Prevalence of moderate and severe hunger	June – July	Sept. – Oct.
Prevalence of exclusive breastfeeding of children under 6 months of age	June – July	Sept. – Oct.
Percent of children 6-23 months of age receiving a minimum acceptable diet	June – July	Sept. – Oct.
Prevalence of women of reproductive age consuming a diet of minimum diversity	June – July	Sept. – Oct.
Prevalence of stunted children under 5 years of age	June – July	Sept. – Oct.
Prevalence of wasted children under 5 years of age	June – July	Sept. – Oct.
Prevalence of underweight children under 5 years of age	June – July	Sept. – Oct.
Prevalence of underweight women of reproductive age	June – July	Sept. – Oct.

PPP=purchasing power parity

Sources: Feed the Future Ethiopia ZOI Baseline Survey 2013; Feed the Future Ethiopia ZOI End-line Survey 2018

Other Issues Regarding Comparability

As indicated above, IFPRI prepared to conduct the Feed the Future end-line survey in the 56 woredas in the Feed the Future ZOI. However, due to considerable insecurity in the Somali region during the period leading up to the survey, IFPRI, with the advice of the CSA, decided to exclude the five woredas in that region from the end-line survey. Consequently, the Feed the Future end-line survey covered 51 of the 56 Feed the Future ZOI woredas and therefore the Feed the Future end-line survey dataset excludes the Somali region. Consequently, all outcome variables provided in Sections 3 through 7 exclude the Somali region for both baseline (2013) and end-line (2018) periods.

[5] See for instance: LIU (2010). *An Atlas of Ethiopian Livelihoods*. Livelihoods Integration Unit (LIU), Disaster Risk Management and Food Security Sector, Ministry of Agriculture, Addis Ababa, Ethiopia.

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.

Age in Years

Data on respondent's age in years is collected in the household roster. For women ages 15-49 and children under 6 years, 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 where available. Age is generally presented in the tables in 5- or 10-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 child'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, for the minimum acceptable diet table (Table 5.7), presents children's age disaggregated into 6-month age groups as follows: 6-11 months, 12-17 months and 18-23 months. For the children's anthropometry tables (Tables 6.3, 6.4, and 6.5), 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—male or female—is a standard disaggregate for the tables presenting children's indicators, e.g., children's anthropometry (Tables 6.3, 6.4, and 6.5).

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 four 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 or grade 8); primary (households with at least one member who has completed primary, but with no member who has completed secondary); and secondary or more (households with at least one

member who has completed secondary education). Households are categorized in only one of the four categories.

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 four categories: no education (those who have not received any formal education), less than primary (those who have received formal education but who have not complete primary); primary (those who have completed primary but have not completed secondary); and secondary or more (those who have completed secondary education).

Gendered Household Type

The USAID's Feed the Future M&E Guidance Series Volume 6: *Measuring the Gender Impact of Feed the Future* notes that household-level indicators should be disaggregated by "gendered household types" – that is: 1) households in which members include both male and female adults (adult is defined as age 18 or older); 2) households in which members include male adult(s), but no female adults; 3) households in which members include female adult(s), but no male adults; and 4) households in which all members are under age 18 (children), i.e., 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 (USAID 2014:1).[6] This variable is calculated using data on age and sex collected in the household roster of the survey questionnaire.

Household Hunger

As described in greater detail in Section 5.1 of this report, the household hunger scale (HHS) characterizes households according to three categories of hunger severity: little to no household hunger, moderate household hunger, and severe household hunger. For the purposes of serving as a disaggregate in selected tables, the HHS is converted to a dichotomous measure reflecting households that report little to no household hunger, and households that report moderate or severe household hunger.

Household Size

For the ZOI Survey, household size is defined as the total number of people (adult and children) that live together in the same dwelling unit. They can be related or unrelated, but they 1)

[6] United States Agency for International Development (USAID). (2014). Feed the Future M&E Guidance Series. Volume 6: Measuring the Gender Impact of FTF, March. Accessed 27 March 2015 at http://www.feedthefuture.gov/resource/volume-6-feed-future-measuring-gender-impact-guidance.

acknowledge the same person or persons as lead decision-makers for the household; 2) share the same housekeeping and cooking arrangements; 3) share the same contiguous roof; and 4) who stayed in the household the night before the survey (*de facto*) as opposed to the usual household residents (*de jure*). This ordinal household size variable is recoded into a categorical variable as follows: small households (1-5 members), medium households (6-10 members), and large households (11 or more members). Note that the definition of household members used in the ZOI Survey may be slightly different from that used in other household surveys.

2.2.2 Reporting Conventions

The Feed the Future Ethiopia Zone of Influence Survey 2018-2019 End-line Assessment is primarily descriptive in nature. This section provides an overview of the conventions used in reporting these descriptive results.

- In the tables throughout this report, weighted point estimates and unweighted sample sizes (denoted by "n") are presented.
- Most estimates are shown to one decimal place, with the specific exceptions of per capita expenditures, women's dietary diversity, WEAI, five domains of empowerment (5DE), and gender parity index (GPI) indicators, which are shown to two decimal places. Unweighted sample sizes in all tables and the population estimates in Tables 1.1 and 1.2 are shown as whole numbers. Values in the tables are suppressed when the unweighted sample size is insufficient to calculate a reliable point estimate (n<30); this is denoted by the use of the symbol "^" in the designated row and an explanatory footnote.

Bivariate relationships are described using cross tabulation, and the strength and direction of the relationships are assessed using statistical tests. For continuous variables, a t-test, or test of differences in mean, is used. For categorical variables, Pearson's chi-squared test, or test of differences in proportions, is used. Explanatory table footnotes clarify the meaning of the significance test annotation, and statistically significant results are highlighted in the narrative throughout the report. Analyses are performed in Stata using "*svy*" commands to handle features of data collected through the use of complex survey designs, including sampling weights, cluster sampling and stratification.

3. ZOI Survey 2018 P1-ZOI Population

This chapter describes the background characteristics of the P1-ZOI population using data from the Feed the Future Ethiopia ZOI Survey 2018 and documents any changes in demographic and household characteristics that occurred since the baseline survey in 2013. The demographic characteristics of the P1-ZOI population are expected to remain relatively similar over time.

3.1 Demographics

Table 3.1a presents demographic characteristics of the households in the P1-ZOI for all households and by gendered household type. This table presents the average household size, as well as the average number of female adults and children within the household. Estimates are also presented by household education, defined as the highest level of education of any member of the household. An average household in the ZOI has five members. All household members of about 17 percent of the households had no education, while at least one member of 0.7 percent households has completed secondary school. A large majority of 56 percent of the households have at least one member with less than primary education while 26 percent have at least one member with primary education.

Table 3.1a Household demographic characteristics in the P1-ZOI

Characteristic	Total (All households)	By gendered household type			
		Male and female adult	Female adult(s) only	Male adult(s) only	Child only
Mean household size	5.1	5.6	2.9	2.5	^
Mean number of adult female household members[1,2]	1.2	1.2	1.2	n/a	^
Mean number of children (<2 years)[1]	0.3	0.4	0.1	0.1	^
Mean number of children (0-4 years)[1]	0.6	0.7	0.3	0.2	^
Mean number of children (5-17 years)[1]	2.1	2.3	1.4	1.0	^
Mean percentage of adults who are female (%)[1,2]	55.5	48.3	100	n/a	^
Highest education level attained (%)					
No education	17.4	11.9	38.4	39.7	^
Less than primary	56.0	57.1	49.9	44.0	^
Primary	26.0	30.1	11.6	16.4	^
Secondary or more	0.7	0.8	0.0	0.0	^
n[3]	**3,890**	**3,106**	**661**	**116**	**7**

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

^ Results not statistically reliable, n<30.

[1] The estimate is based on household members with known age.

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

[3] Sample n is the unweighted count of all households that responded to the survey.

Table 3.1b compares the demographic characteristics of the households in the P1-ZOI in the phase one baseline and end-line ZOI Surveys. Estimates are shown for all households and include the average household size, as well as the average number of female adults, male adults and children within the household. The percentage of households with a male primary adult decision-maker and the percentage of households with a female primary adult decision-maker are also provided. Household education, defined as the highest level of education of any member of the household, is also presented in this table. The average household size is slightly higher in 2018 relative to the average in the baseline (2013). Similarly, the average number of adult females and 5-17 years old children is higher in the end-line relative to the respective averages in the baseline. Relative to the baseline, the end-line has a relatively lower proportion of households with a male primary adult decision-makers and a relatively higher proportion of households with a female primary adult decision-maker. However, these changes are not statistically significant.

Table 3.1b Comparison of household demographic characteristics between the Feed the Future phase one baseline and end-line ZOI Surveys

	Baseline (2013)		End-line (2018)			p-value[1]	Sig.
	Est.	95% CI	Est.	95% CI	Diff.		
Mean household size	4.7	4.6-4.8	5.1	5.0- 5.2	0.0	0.000	***
Mean number of adult male household members[2,3]	1.1	1.0-1.1	1.2	1.1-1.2	0.0	0.000	***
Mean number of adult female household members[2,3,4]	1.1	1.1-1.1	1.2	1.2-1.2	0.0	0.000	***
Mean number of children (<2 years)[2]	0.3	0.31-0.34	0.3	0.33-0.4	0.0	0.191	n/s
Mean number of children (0-4 years)[2]	0.6	0.6-0.7	0.6	0.6-0.7	0.0	0.888	n/s
Mean number of children (5-17 years)[2]	1.9	1.8-1.9	2.1	2.1-2.1	0.0	0.026	**
Mean percentage of adults who are male (%)[2,3]	44.3	43.5-45.1	44.5	43.6-45.1	0.2	0.622	n/s
Mean percentage of adults who are female (%)[2,3,4]	55.7	54.9-56.4	55.5	54.6-56.1	-0.2	0.622	n/s
Mean percentage of households with a male primary adult decision-maker (%)[5]	70.6	69.2-72.0	65.0	63.5-66.5	-5.6	0.000	***
Mean percentage of households with a female primary adult decision-maker (%)[5]	81.6	80.8-83.2	83.6	81.9-84.3	2.0	0.387	n/s
Highest education level attained (%)							
No education	31.1	29.7-32.4	17.4	16.0-18.4	-14.0	0.000	***
Less than primary	52.3	50.8-53.7	56.0	53.9-57.1	4.0	0.000	***
Primary	16.2	15.1-17.2	26.0	25.2-27.9	10.0	0.000	***
Secondary or more	0.4	0.2-0.6	0.7	0.4-0.9	0.0	0.138	n/s
n[6]	**4,245**		**3,890**				

Sources: Feed the Future Baseline Survey 2013, Ethiopia; Feed the Future End-line ZOI Survey 2018, Ethiopia.

^ Results not statistically reliable, n<30.

[1] A t-test of statistical significance of differences between the baseline and end-line estimates of means for continuous variables, and a Pearson's chi-squared test of statistical significance of differences between the baseline and end-line estimates of proportions for categorical variables differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

[2] The estimate is based on household members with known age.

[3] Feed the Future defines adult as an individual age 18 or older.

[4] Females age 15-17 are of reproductive age but are not considered adults by this definition.

[5] Primary decision-maker is the adult in the household who makes the socioeconomic decisions in the household. There can be both a female and male primary decision-maker in the same household though there may only be one or the other – or neither if there are no adults in the household.

[6] Sample n is the unweighted count of all households that responded to the survey.

Overall, there is improvement in educational status in the end-line relative to the baseline. The proportion of households with all-illiterate members declined by 14 percentage points. Similarly, the proportion with a member that completed primary education increased by 10 percentage points.

Tables 3.2a and **3.2b** present characteristics of the female and male primary adult decision-makers in the sampled households in the P1-ZOI and changes in their characteristics since the baseline survey. The female and male primary adult decision-makers are household members age 18 or older who self-identify as the primary adult male or primary adult female responsible for both social and economic decision making within the household. When both exist within a single household, female and male primary adult decision-makers are typically, but not necessarily, husband and wife. Table 3.2a and table 3.2b shows the age group, marital status, literacy status, educational attainment and participation in economic activity for these household members. These characteristics are shown by gender of primary adult decision-makers.

Out of all primary decision-makers in the PI-ZOI end-line survey, about 56.3 percent are female and 43.7 percent male (see Table 2.2). Alternatively, 83.6 percent of sample households have a primary adult female decision-maker, while only 65 percent have a primary male adult decision-maker (see Table 3.1b). The age distributions of female and male decision-makers are almost identical with 68 percent both being under 50 years of age. The majority of primary decision-makers are married, though more female ones are either widowed or separated (26 percent). Literacy rates among male decision-makers (37.9 percent) is more than twice as high as that among female decision-makers (15.1 percent). Comparable fractions of female (93.8 percent) and male (97.5 percent) decision-makers participate in some form of economic activity. The proportion of female primary decision-makers that participated in nonfarm and wage labor activities (17.2 percent) is considerably lower than that of males (25.9 percent).

The age profile of primary decision-makers has shifted up essentially because the same households are surveyed both in the baseline and end-line. The proportion of primary decision-makers with no formal education declined in the end-line relative to the baseline, although the decline was smaller among female primary decision-makers. The likely explanations for this decline include expanding adult literacy programs. Marital status of primary decision-makers has a similar pattern in the baseline and end-line, with little changes across the period. Compared to the baseline, the proportion of both female and male primary decision-makers participating in some form of economic activity increased in the end-line, with the rise more than twice as high for the former (10.1 percentage points) relative to the later (4.7 percentage points). Moreover, the participation rate of male primary decision-makers in nonfarm/wage activities grew faster than that experienced by their female counterparts, while the opposite is true for farm activities.

Table 3.2a.: Comparison of characteristics of primary adult female decision-makers in the PI-ZOI, Feed the Future phase one baseline and end-line ZOI Surveys

Characteristic	Baseline (2013) %	95% CI	n[a]	End-line (2018) %	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
Age									
18-24	15.9	14.7-17.2	553	5.7	4.9-6.5	187	-10.2	0.000	***
25-29	20.0	18.6-21.3	694	14.2	12.9-15.3	460	-5.9	0.000	***
30-39	26.0	24.5-27.5	902	30.8	29.2-32.3	1,000	4.8	0.790	n/s
40-49	12.3	11.1-13.3	425	17.3	15.9-18.5	561	5.0	0.000	***
50-59	15.3	14.1-16.5	530	17.9	16.6-19.2	584	2.6	0.016	*
60+	10.4	9.4-11.4	362	14.2	12.9-15.3	460	3.8	0.000	***
Marital status									
Married	72.2	70.9-73.9	2,510	72.6	70.9-73.9	2,355	0.4	0.020	**
Living in a consensual union	0.7	0.5-1.0	28	0.2	0.03-0.3	6	-0.5	0.879	n/s
Widowed	17.7	16.2-18.7	606	19.1	17.6-20.3	617	1.4	0.654	n/s
Divorced or separated	8.3	7.2-9.1	283	6.9	6.1-7.8	226	-1.4	0.003	**
Never married or in a union	1.1	0.7-1.4	39	1.3	1.0-1.8	48	0.2	0.040	**
Education									
No education	86.4	84.7-87.1	2,967	83.9	81.9-84.5	2,701	-2.5	0.002	***
Less than primary	11.2	10.6-12.7	403	12.8	12.1-14.8	432	1.6	0.040	*
Completed primary	2.3	1.8-2.8	80	3.2	2.7-4.0	110	0.9	0.008	**
Completed secondary	^	^	3	^	^	2	^	^	^
Economic activity[d]									
Participates in some form of economic activity	83.7	82.4-84.8	2,900	93.8	92.6-94.3	3,039	10.1	0.000	***
Participation in economic activity by type[e]									
Farm	82.2	80.9-83.5	2,851	92.1	91.1-92.9	2,993	9.9	0.000	***
Nonfarm	9.7	8.7-10.7	338	11.1	9.9-12.1	358	1.4	0.090	*
Wage/salaried	4.6	3.9-5.3	160	6.1	5.2-6.8	197	1.5	0.000	***
Number of primary adult female decision-makers			**3,466**			**3252**			

^ 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 end-line estimates.

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

[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; nonfarm 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 based on primary adult female decision-makers who are de jure household members.

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

Sources: Feed the Future Ethiopia ZOI Survey 2013; Feed the Future Ethiopia ZOI Survey 2018

Table 3.2b. Comparison of characteristics of primary adult male decision-makers in the PI-ZOI, Feed the Future phase one baseline and end-line ZOI Surveys

Characteristic	Baseline (2013) %	95% CI	n[a]	End-line (2018) %	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
Age									
18-24	7.1	6.1-7.9	211	4.0	3.2-4.7	102	-6.2	0.000	***
25-29	15.7	14.4-16.9	470	6.7	5.7-7.6	169	-7.9	0.000	***
30-39	35.8	34.0-37.5	1,073	34.9	33.1-36.7	881	3.2	0.016	*
40-49	16.8	15.4-18.1	503	23.2	21.5-24.8	586	5.5	0.000	***
50-59	10.9	9.7-12.0	327	13.2	11.9-14.5	334	2.5	0.001	***
60+	13.8	12.6-15.0	414	18.0	16.5-19.5	455	3.1	0.000	***
Marital status									
Married	89.7	88.5-90.7	2,687	90.1	88.5-90	2,266	0.4	0.000	***
Living in a consensual union	^	^	28	^	^	7	^	^	^
Widowed	1.9	1.4-2.3	57	1.8	1.4-2.4	49	-0.1	0.213	n/s
Divorced or separated	2.7	2.1-3.2	80	2.7	2.1-3.4	71	0.0	0.543	n/s
Never married or in a union	4.9	4.1-5.6	146	5.0	4.4-6.2	134	0.1	0.000	***
Education									
No education	61.9	57.6-61	2037	58.8	57.5-60.1	1,503	-3.1	0.000	***
Less than primary	32.8	32-33.9	1081	35.1	33.9-36.4	1,033	2.3	0.000	***
Completed primary	5.1	5.0-6.4	169	5.8	5.2-6.4	185	0.7	0.007	***
Completed secondary	^	^	3	^	^	5	0.19	0.328	n/s
Economic activity[d]									
Participates in some form of economic activity	92.8	91.4-93.3	2,769	97.5	96.6-97.9	2,460	4.7	0.000	***
Participation in economic activity by type[e]									
Farm	91.3	90.2-92.3	2,737	96.2	95.5-96.9	2,433	4.9	0.000	***
Nonfarm	11.2	10.0-12.3	335	13.9	12.5-15.3	352	2.7	0.022	**
Wage/salaried	9.7	8.6-10.7	290	12	10.7-13.3	305	2.3	0.004	***
Number of primary adult male decision-makers			2,998			2,527			

^ 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 end-line estimates.

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

[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; nonfarm 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 based on primary adult male decision-makers who are de jure household members.

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

Sources: Feed the Future Ethiopia ZOI Survey 2013; Feed the Future Ethiopia ZOI Survey 2018

3.2 Living Conditions

Table 3.3a shows dwelling characteristics of the households in the P1-ZOI for the Feed the Future phase one baseline and end-line surveys. Many of these measures align with the Sustainable Development Goals (SDGs) definitions (UNSTATS, n.d.). The table presents the percentage of households who have access to an improved water source, improved sanitation, electricity and solid cooking fuel. The percentages of households practicing a correct water treatment practice or technology and those practicing open defecation are also included. The average number of people per sleeping room, as well as roof, exterior wall and floor materials are also presented. Estimates are shown for all households. Because changes in these characteristics over time may also influence changes in the Feed the Future indicators, the results of the test of statistical differences between the baseline and end-line surveys are also provided.

Table 3.3a reveals that 66 percent of the households have access to improved water sources in the end-line and this was nearly 10 percentage points higher than the proportion in the baseline. Only 10 percent of the households use a correct water treatment practice in the end-line; this is a small percentage point change, but it is a statistically significant increase from baseline. Similarly, the proportion with access to improved sanitation that isn't shared with others declined slightly (62 percent), while the proportion practicing open defecation (37 percent) increased slightly in the end-line; both percentage point changes are small but statistically significant. Virtually all households used solid fuel for cooking both in the baseline and end-line. The proportion with access to electricity in the end-line (22 percent) was more than 3 folds of the proportion in the baseline. There was a 10 percent increase in the average number of people per sleeping room in the end-line relative to the baseline.

Residences of about one-thirds of the households have natural (mostly straw) roofs and the proportion is lower in the end-line relative to the baseline. About two-thirds of the houses have finished roofs and this proportion increased during the period. Over 95 percent of the households live in houses with natural walls and floors, and these proportions did not change across the two rounds.[7]

[7] The proportion of houses with exterior walls made of the third category of materials (Rudimentary) could not be computed due to differences in coding of building materials in the baseline (2013) and end-line (2018) surveys.

Table 3.3a Comparison of household dwelling characteristics between the Feed the Future phase one baseline and end-line ZOI Surveys

Characteristic	Baseline (2013)		End-line (2018)			p-value[1]	Sig.[1]
	Est.	95% CI	Est.	95% CI	Diff.		
Percent with improved water source (%)[2]	57.1	55.4-58.4	66.2	65.2-68.2	9.1	0.000	***
Percent using a correct water treatment practice or technology (%)[3]	8.1	7.5-9.2	10.2	9.1-10.9	2.1	0.009	**
Percent with improved sanitation, not shared (%)[4]	63.1	61.3-64.2	61.5	59.5-62.5	-1.6	0.097	*
Percent with improved sanitation, shared (%)[4]	0.1	0.1-0.1	0.1	0.1-0.1	0.0	0.871	n/s
Percent with unimproved sanitation (%)[5]	1.0	0.5-1.1	0.9	0.5-1.1	-0.1	0.728	n/s
Percent practicing open defecation (%)[6]	35.6	34.5-37.4	37.4	36.4-39.5	1.8	0.054	*
Percent using solid fuel for cooking (%)[7]	98.8	98.5-99.1	98.9	98.5-99.2	0.1	0.926	n/s
Percent with access to electricity (%)	6.3	5.9-7.4	21.8	20.0-22.6	15.5	0.000	***
Mean persons per sleeping room[8]	4.7	4.6- 4.9	5.1	5.1-5.2	0.4	0.000	***
Household roof materials (%)[9]							
Natural	43.2	42.4-45.4	32.4	31.6-34.6	-10.8	0.000	***
Rudimentary	1.2	0.9-1.6	0.3	0.1-0.5	-0.9	0.005	***
Finished	55.6	53.3-56.3	67.2	64.9-67.9	11.6	0.000	***
Household exterior wall materials (%)[10]							
Natural	96.2	93.8-95.2	96.7	94.8-96.1	0.5	0.501	n/s
Finished	3.7	4.8-6.1	3.3	3.8-5.2	-0.4	0.502	n/s
Household floor materials (%)[11]							
Natural	95.7	94.7-95.9	95.3	94.6- 95.9	-0.4	0.765	n/s
Rudimentary	2.8	2.6-3.7	1.1	0.8-1.4	-1.7	0.001	***
Finished	1.4	1.1- 1.7	3.6	3.1- 4.2	2.2	0.008	***

Sources: Feed the Future Baseline Survey 2013, Ethiopia; Feed the Future End-line ZOI Survey 2018, Ethiopia 2019

[1] A t-test of statistical significance of differences between the baseline and end-line estimates of means for continuous variables, and a Pearson's chi-squared test of statistical significance of differences between the baseline and end-line estimates of proportions for categorical variables. Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

[2] 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* (WHO and UNICEF 2006). The proportion of the population with sustainable access to an improved water source is the SDG indicator 6.1.1 (UN ECOSOC 2016). The measure includes regularity in access to the water source – namely, that (a) water is available from this source all year round and (b) water from this source was available every day in the 2 weeks preceding the survey.

[3] Correct water treatment practice or technology refers to methods that effectively kill or remove pathogens. This includes *boiling the water*, *adding bleach or chlorine*, *using a water filter (ceramic, sand, composite)* and *solar disinfection* (WHO and UNICEF 2006). Practices such as *straining through a cloth* and *letting it stand and settle* are not considered effective approaches of water treatment.

[4] Improved sanitation facilities are those that separate human excreta from human contact and include the categories *flush to piped sewer system*, *flush to septic tank*, *flush/pour flush to pit*, *composting toilet*, *ventilated improved pit latrine* and *pit latrine with a slab*. Because shared and public facilities are often less hygienic than private facilities, shared or public sanitation facilities are not counted as improved (WHO and UNICEF 2006). The proportion of the population with access to improved sanitation is the SDG indicator 6.2.1 (UN ECOSOC 2016).

[5] A sanitation facility is considered unimproved if human excreta is not adequately separated from human contact. This includes the following: *flush/pour flush elsewhere*; *pit latrine without a slab/open pit*; *bucket*; and *hanging toilet*. Households that report having no sanitation facility, or using the bush or field are considered as using an unimproved sanitation facility (WHO and UNICEF 2006).

[6] Households that report having no sanitation facility, or using the bush or field are considered as practicing open defecation.

[7] Solid fuel is defined as *charcoal*, *wood*, *animal dung*, *straw/shrubs/grass* and *agriculture crop residue*. The *other* and *no food cooked in household* categories are removed from percentages. SDG indicator 7.1.2 focuses on the proportion of population with primary reliance on clean fuels and technology so the indicator is not directly comparable to the SDG indicator on type of fuel used by households (UN ECOSOC 2016).

[8] The average number of persons per sleeping room is a common indicator of crowding (UNDP 2003).

[9] Natural roof includes *no roof, thatch (palm leaf, straw, reed),* and *sod or bamboo.* Rudimentary roof includes *wood planks* and *cardboard.* Finished roofs include *metal, wood, calamine/cement fiber, ceramic tiles, cement* and *roofing shingles.* The *other* category is removed from percentages.

[10] Natural wall includes *no walls, cane/palm/tree trunks, dirt, bamboo with mud and stone with mud.* Rudimentary walls include *plywood, cardboard, reused wood* and *unbaked bricks.* Finished walls include *cement, stone with lime/cement, bricks, cement blocks, unbaked bricks covered with plaster* and *wood planks/shingles.* The *other* category is removed from percentages.

[11] Natural floors include *earth/sand, dung and palm leaves.* Rudimentary floors include *wood planks* and *bamboo slats.* Finished floors include *parquet/polished wood, vinyl or asphalt strips, ceramic tiles, cement* and *wall-to-wall carpet.* The *other* category is removed from percentages.

Tables 3.3b compares the dwelling characteristics of households in the P1-ZOI by gendered household type between the phase one baseline and end-line ZOI Surveys. The results of the test of statistical differences between the baseline and end-line surveys are also provided.

Table 3.3b reveals that the proportion using an improved water source was about 10 percentage points higher in the end-line relative to the baseline in households with male and female adults as well as in households with only female adults. Similarly, access to electricity increased by over 12 percentage points in the latter households. The proportion of households with only male adults that use solid fuel was slightly higher in the end-line.

Table 3.3b. Comparison of household dwelling characteristics, by gendered household type, between the Feed the Future phase one baseline and end-line ZOI Surveys

Household characteristic	Baseline (2013)		End-line (2018)		Diff.	p-value[1]	Sig.
	Est.	95% CI	Est.	95% CI			
Households using an improved water source[2]							
Male and female adult(s)	57.2	55.3-58.7	66.8	65.8-69.1	9.6	0.000	***
Female adult(s) only	55.4	51.2-58.2	63.6	60.1-67.4	8.2	0.010	**
Male adult(s) only	62.1	55.5-68.8	66.2	57.7-75.1	4.1	0.492	n/s
Child(ren) only	^	^	^	^	-	-	-
Households using a correct water treatment practice or technology[3]							
Male and female adult(s)	8.3	7.5-9.4	10.8	9.5-11.7	2.5	0.142	n/s
Female adult(s) only	7.5	6.0-9.8	8	5.8-9.9	0.5	0.808	n/s
Male adult(s) only	7.2	4.1-11.3	6.7	1.6-10.4	-0.5	0.888	n/s
Child(ren) only	^	^	^	^	-	-	-
Households using an improved sanitation facility, non-shared[4]							
Male and female adult(s)	65.6	63.4-66.7	64	61.6-65.1	-1.6	0.444	n/s
Female adult(s) only	54.7	51.8-58.8	51.2	47.6-55.2	-3.5	0.211	n/s
Male adult(s) only	54.9	47.7-61.3	52.6	42.5-60.9	-2.3	0.67	n/s
Child(ren) only	^	^	^	^	-	-	-
Households using an improved sanitation facility, shared[4]							
Male and female adult(s)	0.2	0.09-0.2	0.1	0.01-0.2	-0.1	0.301	n/s
Female adult(s) only	0.0	-	0.3	0.1-0.7	0.3	0.159	n/s
Male adult(s) only	0.8	0.3-2.2	1.2	0.6-4.1	0.4	0.713	n/s
Child(ren) only	^	^	^	^	-	-	-
Households using an unimproved sanitation facility[5]							
Male and female adult(s)	0.7	0.4-0.9	0.8	0.5-1.1	0.1	0.575	n/s
Female adult(s) only	0.7	0.7-1.2	0.9	0.3-1.8	0.2	0.672	n/s
Male adult(s) only	2.5	0.04-3.7	1.1	0.8-2.5	-1.4	0.395	n/s
Child(ren) only	^	^	^	^	-	-	-
Households practicing open defecation[6]							
Male and female adult(s)	33.2	32.1-35.3	35.1	34.1-37.5	1.9	0.361	n/s
Female adult(s) only	44.2	40.1-47.1	47.5	43.4-51.1	3.3	0.218	n/s
Male adult(s) only	41.4	35.3-48.8	45.1	36.5-54.9	3.7	0.502	n/s
Child(ren) only	^	^	^	^	-	-	-

Households using solid cooking fuels[7]							
Male and female adult(s)	99.2	98.7-99.4	98.9	98.4-99.2	-0.3	0.519	n/s
Female adult(s) only	98.7	97.9-99.5	99.1	98.1-99.7	0.4	0.493	n/s
Male adult(s) only	94.7	92.3-98.1	98.6	95.9-100	3.9	0.04	**
Child(ren) only	^	^	^	^	-	-	-
Households with access to electricity							
Male and female adult(s)	6.1	5.6-7.3	22.7	20.7-23.6	16.6	0.000	***
Female adult(s) only	6.5	5.1-8.6	19.1	15.7-21.7	12.6	0.000	***
Male adult(s) only	8.8	4.7-12.4	13.3	6.7-19.1	4.5	0.308	n/s
Child(ren) only	^	^	^	^	-	-	-

Sources: Feed the Future Baseline Survey, Ethiopia 2013; Feed the Future End-line ZOI Survey 2018, Ethiopia.

[1] A Pearson's chi-squared test of statistical significance of differences between the baseline and end-line estimates of proportions. Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

[2] 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* (WHO and UNICEF 2006). The proportion of the population with sustainable access to an improved water source is the SDG indicator 6.1.1 (UN ECOSOC 2016). The measure includes regularity in access to the water source – namely, that (a) water is available from this source all year round and (b) water from this source was available every day in the 2 weeks preceding the survey.

[3] Correct water treatment practice or technology refers to methods that effectively kill or remove pathogens. This includes *boiling the water*, *adding bleach or chlorine*, *using a water filter (ceramic, sand, composite)* and *solar disinfection* (WHO and UNICEF 2006). Practices such as *straining through a cloth* and *letting it stand and settle* are not considered effective approaches of water treatment.

[4] Improved sanitation facilities are those that separate human excreta from human contact and include the categories *flush to piped sewer system*, *flush to septic tank*, *flush/pour flush to pit*, *composting toilet*, *ventilated improved pit latrine* and *pit latrine with a slab*. Because shared and public facilities are often less hygienic than private facilities, shared or public sanitation facilities are not counted as improved (WHO and UNICEF 2006). The proportion of the population with access to improved sanitation is the SDG indicator 6.2.1 (UN ECOSOC 2016).

[5] A sanitation facility is considered unimproved if human excreta is not adequately separated from human contact. This includes the following: *flush/pour flush elsewhere*; *pit latrine without a slab/open pit*; *bucket*; and *hanging toilet*. Households that report having no sanitation facility, or using the bush or field are considered as using an unimproved sanitation facility (WHO and UNICEF 2006).

[6] Households that report having no sanitation facility, or using the bush or field are considered as practicing open defecation.

[7] Solid fuel is defined as *charcoal*, *wood*, *animal dung*, *straw/shrubs/grass* and *agriculture crop residue*. The *other* and *no food cooked in household* categories are removed from percentages. SDG indicator 7.1.2 focuses on the proportion of population with primary reliance on clean fuels and technology so the indicator is not directly comparable to the SDG indicator on type of fuel used by households (UN ECOSOC 2016).

3.3 Education

Table 3.4a and **Table 3.4b** present school attendance, educational attainment and literacy in the P1-ZOI. Table 3.4a presents the percentage of all household members between ages 5 and 24 who currently attend school, the percentage of household members over age 9 who have completed primary school, and the percentage of household members over age 4 who are literate. Table 3.4b presents the same percentages separately for females and males. Table 3.4a also includes sex ratios for school attendance, attainment of primary education and literacy.

In Ethiopia, primary education is defined as 8 years of education (in grades 1 through 8).

Tables 3.4a and 3.4b reveal that the proportion of children aged 5-9 attending school is low at 30 percent. This may indicate that children start attending schools late, particularly when comparing this to 77 and 68 percent of children aged 10-14 and 15-19, respectively, that are attending schools. Thirty percent of children aged 15-19 completed primary school and 89 percent are literate while primary school completion was higher (47 percent) and literacy was slightly lower (78 percent) among 20–24-year-olds.

The results also reveal that the proportion of females under 20 that are attending schools and are literate is about the same as the proportion of males while the proportion of females under 20 that completed primary schools is considerably higher. However, the proportion of females aged 20 and older that completed primary school and that are literate are lower than the proportion of males, which may indicate that households are now enrolling a higher proportion of girls into schools or that females stop schooling as they get older or both.

Table 3.4a. School attendance, educational attainment and literacy in the P1-ZOI

Age group (years)	Percent			Female to male ratio			n
	Attending school[1]	Attained a primary level of education[2]	Literate[3]	Attending school[1]	Attained a primary level of education[2]	Literate[3]	
5-9	29.7	n/a	31.5	1.0	0.0	1.0	3,282
10-14	77.3	1.8	83.8	1.0	2.4	1.0	3,502
15-19	68.2	30.0	88.9	1.0	1.3	1.0	2,229
20-24	33.6	47.0	78.4	0.6	0.9	0.8	1,168
25-29	0.0	36.9	53.1	0.0	0.7	0.5	1,083
30-34	0.0	24.5	33.5	0.0	0.5	0.4	1,194
35-54	0.0	14.4	30.4	0.0	0.7	0.3	3,251
55+	0.0	6.7	13.6	0.0	0.4	0.1	1,644

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

[1] Estimates include only household members who are 5-24 years old.

[2] Estimates include only household members who are 10 years old or older.

[3] Estimates include only household members who are 5 years or older.

Table 3.4b. School attendance, educational attainment and literacy in the P1-ZOI, by age and sex

Age group (years)	Female				Male			
	Attending school[1] (%)	Attained a primary level of education[2] (%)	Literate[3] (%)	n	Attending school[1] (%)	Attained a primary level of education[2] (%)	Literate[3] (%)	n
5-9	30.4	n/a	32.1	1673	29.6	n/a	31.7	1609
10-14	77.3	2.7	83.6	1768	75.7	1.1	83	1734
15-19	67.7	34.6	89.1	944	67.9	27.6	88.9	1285
20-24	24.4	45.5	71.1	454	38.2	48.8	84.2	714
25-29	0.0	30.3	41	669	0.0	42.9	74.9	414
30-34	0.0	15.8	20.7	706	0.0	28.7	54.9	488
35-54	0.0	11.6	14.1	1640	0.0	16.6	48.3	1611
55+	0.0	3.2	3.5	885	0.0	7.5	26.4	759

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

n/a = not applicable

[1] Estimates include only household members who are 5-24 years old.

[2] Estimates include only household members who are 10 years or older.

[3] Estimates include only household members who are 5 years or older.

Table 3.5 provides a comparison of a household member's highest educational attainment between the phase one baseline and end-line ZOI Surveys for all individuals and by sex of individuals. Generally, the highest education achieved by any member of the household improved over the period, and the change is statistically significant. The percentage of household members with no education was 45 percent lower in the end-line relative to the baseline. Looking at the educational status by sex of the household members, relative to males a higher percentage of female members were illiterate during both baseline and end-line ZOI Surveys. Moreover, the decline in the proportion of illiterate household members was relatively higher among males than females. However, level of education has improved over the two period for both male and female members.

Table 3.5. Comparison of household member educational attainment in the PI-ZOI, in total and by sex, Feed the Future phase one baseline and end-line ZOI Surveys

Sex and highest educational attainment[a]	Baseline (2013)			End-line (2018)					
	%	95% CI	n	%	95% CI	n	Diff.	p-value[b]	Sig.[c]
Total									
No education	31.1	29.7-32.4	1440	17	16.0-18.4	670	-13.9	0.000	***
Less than primary	52.3	50.8-53.7	2420	56	53.9-57.1	2159	3.7	0.003	***
Completed primary	16.2	15.1-17.2	748	26	25.2-27.9	1034	9.8	0.000	***
Completed secondary	^	^	20	^	^	26	-	-	-
Female									
No education	54	52.5-55.5	2438	39	37.1- 40.1	1469	-15.4	0.000	***
Less than primary	38.7	37.3-40.1	1747	48	46.5-49.6	1830	9.4	0.000	***
Completed primary	7.1	6.3- 7.8	320	13	12.1-14.2	501	6.1	0.000	***
Completed secondary	^	^	8	^	^	5	-	-	-
Male									
No education	37.7	36.3-39.2	1601	23	21.1- 23.8	797	-15.2	0.000	***
Less than primary	49.4	47.9-50.9	2093	57	55.1-58.3	2009	7.3	0.000	***
Completed primary	12.4	11.4-13.4	529	20	18.8 -21.5	715	7.8	0.000	***
Completed secondary	^	^	13	^	^	21	-	-	-

^ Results not statistically reliable, n<30

Sources: Feed the Future Baseline Survey 2013, Ethiopia; Feed the Future End-line ZOI Survey 2018, Ethiopia.

[a] Estimates include only de facto household members who are 5 years of age or older.

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

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

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

Feed the Future Ethiopia ZOI Survey 2013; Feed the Future Ethiopia ZOI Survey 2018

4. Household Economic Status

This chapter includes a background discussion of monetary poverty in Ethiopia, including the logic of the Living Standard Measurement Survey (LSMS)[8] and consumption expenditures methodology. Appendix A2.2 provides an overview of the methodology for calculating the Feed the Future PI-ZOI poverty indicators. Additional details are provided in the Feed the Future Guide to Statistics.

The Household Roster and Household Consumption Expenditure survey modules are used to calculate the per capita expenditures and prevalence of poverty indicators. The household consumption expenditure module is similar to the LSMS, in which households' consumption of various food and non-food items is measured to infer household income and well-being. 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 incomes, based on the assumption that a household's consumption is closely related to its income. 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.[9]

Ethiopia recorded a rapid economic growth over the last 15 years since 2004/05. The continued growth has contributed to the decline in poverty. Official statistics indicate that poverty declined nationwide from about 44 percent in 1996 to 23 percent in 2015. Consistent with these figures, we see an increase in per capita expenditure and a decline in poverty among households in the Feed the Future ZOI.

4.1 Daily Per Capita Consumption Expenditures

Table 4.1a presents the Feed the Future ZOI indicator daily per capita consumption expenditures in constant 2010 USD. Daily per capita consumption expenditures serve as a proxy for income.

Table 4.1a includes the overall mean daily per capita consumption expenditures and the mean daily per capita consumption expenditure for selected percentiles of households. The percentiles provide information on the distribution of consumption expenditures. As is typical of consumption expenditure and income data, these estimates are positively skewed, with the majority of the population consuming or spending very little, and a small portion of the population consuming much more (see Figure 4.1 also). The mean, therefore, is affected by these outliers who consume much more. A summary statistic more robust to outliers is the median (or the

[8] Grosh, Margaret and Paul Glewwe. 1995. "A Guide to Living Standards Measurement Study Surveys and Their Data Sets." Living Standards Measurement Study Group. Working paper No. 120. The World Bank, Washington, DC.

[9] Deaton, A. 2008. The Analysis of Household Surveys: A microeconomic approach to development policy. Baltimore: The Johns Hopkins University Press.

50th percentile). Estimates in Table 4.1a are shown for all households as well as disaggregated by household characteristics, including gendered household type, household size, and household educational attainment.

Average daily per capita consumption expenditure was $2.19 in constant 2010 USD in the P1-ZOI at the time of the 2018 Ethiopia ZOI Survey. Median (50th percentile) daily per capita consumption expenditure was equivalent to $1.60, indicating that 50 percent of all individuals in the P1-ZOI had daily per capita consumption expenditures less than $1.60 in 2005 PPP.

Table 4.1a Daily per capita consumption expenditures by household characteristic (in constant 2010 USD[1]) in the P1-ZOI

Characteristic	Estimate (weighted) (constant 2005 PPP)						
		Percentile					
	Mean	10th	25th	50th	75th	90th	n[2]
All households	2.19	0.57	0.95	1.60	2.72	4.34	3,876
Gendered household type							
Male and female adults	2.22	0.58	0.97	1.64	2.76	4.40	3,089
Female adult(s) only	1.95	0.47	0.79	1.31	2.35	4.05	665
Male adult(s) only	2.05	0.59	0.87	1.60	2.50	3.71	115
Children only	^	^	^	^	^	^	7
Household size							
Small (1-5 members)	2.37	0.61	1.01	1.68	2.93	4.66	2,257
Medium (6-10 members)	2.08	0.58	0.91	1.55	2.57	4.18	1,574
Large (11+ members)	1.51	0.14	0.24	1.07	2.46	3.00	45
Household educational attainment							
No education	1.97	0.43	0.80	1.49	2.50	3.74	664
Less than primary	2.13	0.57	0.90	1.54	2.62	4.26	2,153
Primary	2.36	0.61	1.05	1.78	2.92	4.72	1,032
Secondary or more	^	^	^	^	^	^	26

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

[1] Daily per capita consumption expenditures measured in Birr were converted to constant 2010 USD using the 2005 and 2010 Consumer Price Index (CPI) and the 2005 Purchasing Power Parity (PPP) Index estimated by the World Bank. We used the formula: (Per capita expenditures LCU)/ (2005 PPP LCU* (2018 CPI LCU/2005 CPI LCU) * (2010 CPI USD/2005 CPI USD)). The 2005 PPP LCU for Ethiopia is 2.75, 2018 CPI LCU/2005 CPI LCU=5.68. The conversion factor is 17.4.

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

Estimates in Table 4.1a also indicate that the median (50th percentile) per capita consumption expenditure for households was 2.8 times higher than the average of that of households in the bottom 10 percentile by consumption expenditures. Similarly, mean per capita consumption expenditure of households in the top 90 percentile is 7.6 times higher relative to those in the lowest 10 percentile. Mean consumption expenditure of households with male and female adults was the highest and that of those with female adults only the lowest. Moreover, this expenditure

level appears to decline with increase in household size and increase with educational attainment of households.

Table 4.1b compares average daily per capita expenditures between the phase one baseline and end-line ZOI surveys. The average daily per capita consumption expenditure has increased by 23.7 percent from $1.77 in the baseline to $2.19 in the end-line and this difference is highly statistically significant. The increment is in real terms, meaning the impact of inflation has been accounted for.

Table 4.1b Comparison of daily per capita consumption expenditures in constant 2010 USD at 2005 PPP between the Feed the Future phase one baseline and end-line ZOI Surveys[1]

Indicator	Baseline (2013)	End-line (2018)	p-value[2](sig)
Daily per capita consumption expenditures	1.77	2.19	0.0000 (***)

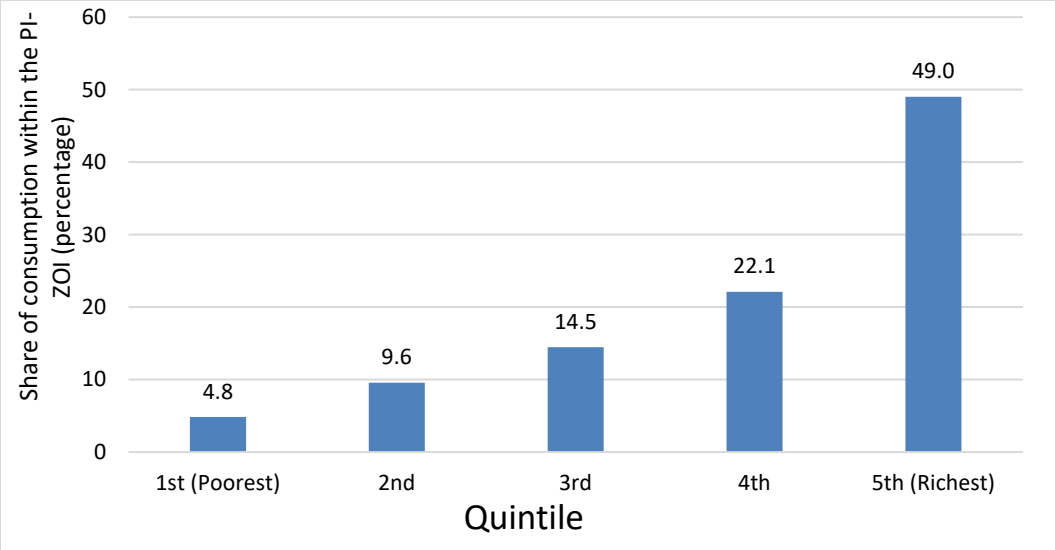
Source: Feed the Future Baseline Survey 2013, Ethiopia; Feed the Future End-line ZOI Survey 2018, Ethiopia.

[1] Daily per capita consumption expenditures measured in Birr were converted to constant 2010 USD using the 2005 and 2010 Consumer Price Index (CPI) and the 2005 Purchasing Power Parity (PPP) Index estimated by the World Bank. We used the formula: (Per capita expenditures LCU)/ (2005 PPP LCU* (2018 CPI LCU/2005 CPI LCU) * (2010 CPI USD/2005 CPI USD)). The 2005 PPP LCU for Ethiopia is 2.75, 2018 CPI LCU/2005 CPI LCU=5.68. The conversion factor is 17.4 for the end-line survey. The 2013 level, computed similarly using corresponding parameters, is found to be 12.17.

[2] A t-test of statistical significance of differences between the baseline and end-line estimates of mean expenditure. Differences found to be statistically significant are indicated by level: * p<0.05, ** p<0.01, *** p<0.001.

Figure 4.1 shows the share of total consumption per quintile in the ZOI. Inequality is high in the ZOI. The richest 20 percent of the population consume nearly half of total consumption in the ZOI. In contrast, the poorest 20 percent consume only about 5 percent of the total consumption.

Figure 4.1. Share of consumption per quintile: Feed the Future P1-ZOI



[1] The poorest quintile is determined as the bottom fifth of the population by consumption expenditure. The poorest quintile's share of total consumption is calculated by dividing the consumption of the poorest quintile by total consumption within the P1-ZOI.

Table 4.1c compares average daily per capita consumption expenditures in constant 2010 USD between the phase one baseline and end-line ZOI surveys for all households in the P1-ZOI, as well as disaggregated by gendered household type, household educational attainment, and household hunger scale. The table shows that average daily per capita consumption expenditure in 2010 USD has statistically significantly increased for "Male and female adults" households, households with some education, and households which experienced "little to no hunger."

Table 4.1c Comparison of mean daily per capita consumption expenditures in Constant 2010 USD at 2005 PPP in the PI-ZOI, in total and by selected household characteristics, Feed the Future phase one baseline and end-line ZOI Surveys

	Baseline (2013)			End-line (2018)					
Characteristic	**Mean**	**95% CI**	**N**	**Mean**	**95% CI**	**n**	**Diff.**	**p-value[a]**	**Sig.[b]**
All households	1.77	1.70-1.84	4,618	2.19	2.10-2.27	3,876	0.42	0.000	***
Gendered household type									
Male and female adults	1.73	1.65-1.81	3,534	2.21	2.12-2.31	3,089	0.48	0.000	***
Female adults only	1.87	1.74-1.99	855	1.95	1.79-2.11	665	0.08	0.383	n/s
Male adults only	2.35	2.06-2.63	224	2.05	1.53-2.56	115	-0.35	0.250	n/s
Children only	^	^	2	^	^	7	^	^	^
Household education									
No education	1.82	1.73-1.92	1,434	2.96	1.81-2.12	664	0.14	0.171	n/s
Less than primary	1.74	1.63-1.85	2,412	2.13	2.01-2.26	2,153	0.39	0.000	***
Completed primary	1.79	1.66-1.92	746	2.36	2.22-2.49	1,032	0.57	0.000	***
Secondary or more	^	^	20	^	^	26	^	^	^
Household hunger									
Little to no hunger	1.78	1.71-1.86	4,378	2.21	2.12-2.29	3,747	0.43	0.000	***
Moderate hunger	1.47	1.29-1.65	198	1.54	1.21-1.88	105	0.07	0.698	n/s
Severe hunger	1.16	0.77-1.55	34	^	^	23	^	^	^

^ Results not statistically reliable, n<30

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

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

Notes: Estimates are sample-weighted; numbers of observations are unweighted. Estimates are based on de jure household members.

Daily per capita consumption expenditures measured in Birr were converted to constant 2010 USD using the 2005 and 2010 Consumer Price Index (CPI) and the 2005 Purchasing Power Parity (PPP) Index estimated by the World Bank. We used the formula: (Per capita expenditures LCU)/ (2005 PPP LCU* (2018 CPI LCU/2005 CPI LCU) * (2010 CPI USD/2005 CPI USD)). The 2005 PPP LCU for Ethiopia is 2.75, 2018 CPI LCU/2005 CPI LCU=5.68. The conversion factor is 17.4 for the end-line survey. The 2013 level, computed similarly using corresponding parameters, is found to be 12.17.

Sources: Feed the Future Ethiopia ZOI Survey 2013; Feed the Future Ethiopia ZOI Survey 2018.

4.2 Prevalence and Depth of Poverty in the P1-ZOI

The prevalence of poverty, sometimes called the poverty headcount ratio, is measured by the percentage of individuals living below a poverty threshold.[10] Estimates of poverty prevalence are

[10] Note that consumption expenditure data are not collected at the individual level but rather at the level of the household; daily per capita consumption expenditures are then derived by dividing total household expenditures by the number of household members.

sensitive to the poverty thresholds used to identify the poor. A standardized poverty threshold of $1.25 per person per day in adjusted[11] 2005 PPP USD is used to track global changes in poverty across countries. The $1.25 threshold is in effect the extreme poverty threshold and represents the poverty line typical of the world's poorest countries.[12] Poverty estimates may also be presented for an individual country's own poverty and extreme poverty thresholds.

Although poverty prevalence indicates how *many* individuals are impacted by poverty, it does not speak to how *much* people are impacted by poverty. In other words, it implicitly assumes that all those below the poverty line are equally poor. The depth of poverty, often called the poverty gap, is a useful poverty estimate because it captures the intensity of poverty. This measure indicates the average gap between consumption expenditure levels of the poor and the poverty line, with the non-poor counted as having a gap of zero. The measure is expressed as a proportion of the poverty line. The depth of poverty or poverty gap represents the entire ZOI population. The average consumption expenditure shortfall of the poor, in contrast, is estimated for only those individuals living below the poverty line.

4.2.1 The $1.25 Poverty Threshold

Table 4.2a presents poverty estimates at the $1.25 per person per day (2005 PPP) threshold. The prevalence of poverty and depth of poverty at the $1.25 per person per day poverty line are Feed the Future PI-ZOI indicators. Similar to the daily per capita consumption expenditures table, this table presents poverty estimates for all households in the P1-ZOI, as well as disaggregated by gendered household type, household size and household educational attainment.

Poverty Prevalence

According to the estimates in Table 4.2, prevalence of poverty, which is measured by percent of people living below $1.25 per person per day in 2005 PPP, is 32.3 percent. The prevalence of poverty is lowest for male and female adult households and highest for female adult only households; it increases with household size and declines with educational attainment.

Using this measure, poverty declined by over 7 percentage points from the baseline estimate of about 39.9 percent (Table 4.3a). This difference is statistically significant. When disaggregated by household characteristics, the prevalence of poverty has considerably and statistically significantly

[11] Per capita expenditure measured in Birr (the local currency unit (LCU)) were converted to 2005 USD PPP using the PPP conversion factor estimated (and annually updated until 2011) by the World Bank and the Consumer Price Index (CPI) computed by the Central Statistical Agency (CSA). We used the formula (Per capita expenditures in 2018 LCU)/ (2005 USD PPP* (2018 CPI LCU/2005 CPI LCU)). The 2005 USD PPP (in 2005 prices) for Ethiopia is 2.75, (2018 CPI LCU/2005 CPI LCU)=5.68 and the product of the two gives us the adjusted conversion factor as 15.62. The 2013 levels were computed similarly using corresponding parameters including the (2013 CPI LCU/2005 CPI LCU)=3.96. The 2005 international poverty line is $1.25 USD PPP, while that of 2011 is 1.9 USD PPP.

[12] United Nations Statistics Division. nd. Millennium Development Goals Indicators. https://millenniumindicators.un.org/unsd/mdg/Metadata.aspx?IndicatorId=0&SeriesId=580

declined for male and female adult households while there was a slight but statistically insignificant increase in the prevalence of poverty for female adult only and male adult only households.

Table 4.2. Poverty in the ZOI at the international poverty line of $1.25 (2005 PPP) - 2018

Characteristic	Prevalence of Poverty[2,5]		Depth of Poverty[3,5]		Average consumption shortfall of the poor[4,5]	
	Percent population	n[5]	Percent of poverty line[b]	n[5]	In USD 2005 PPP	n[5]
Total (All households)	32.3	3876	12.2	3876	0.5	1,230
Gendered household type						
Male and female adults	31.3	3,089	11.8	3,089	0.5	920
Female adult(s) only	40.9	665	15.8	665	0.5	265
Male adult(s) only	36.3	115	12.5	115	0.4	42
Child(ren) only (no adults)	^	7	^	7	^	3
Household size						
Small (1-5 members)	29.3	2,267	10.4	2,267	0.4	685
Medium (6-10 members)	33.6	1,578	12.5	1,578	0.5	525
Large (11+ members)	51.5	45	32	45	^	20
Household education						
No education	37.3	670	15.6	670	0.5	247
Less than primary	33.7	2,159	12.4	2,159	0.5	704
Primary	30.7	1,034	10.7	1,034	0.5	270
Secondary or more	27.2	26	10.5	26	^	9

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

^ Results not statistically reliable, n<30.

[1] The poverty headcount ratio is computed as the percentage of the ZOI population living on less than $1.25 a day at 2005 PPP prices.

[2] The prevalence of poverty is the percentage of individuals living below the national poverty line. Poverty prevalence is sometimes referred to as the poverty incidence or poverty headcount ratio.

[3] The depth of poverty, or poverty gap, is the average consumption shortfall as a percentage of the poverty line.

[4] 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.

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

Table 4.3a: Comparison of prevalence of poverty at the $1.25 (2005 PPP) per person per day threshold in the PI-ZOI, in total and by selected household characteristics, Feed the Future phase one baseline and end-line ZOI Surveys

Characteristic	Baseline (2013)			End-line (2018)			Diff.	p-value[b]	Sig.[c]
	%	95% CI	n[a]	%	95% CI	n[a]			
All households	39.9	38.5-41.4	4,618	32.3	30.8-33.8	3,876	-7.6	0.000	***
Gendered household type									
Male and female adults	40.4	38.8-42.0	3,534	31.3	29.6-32.9	3,089	-9.1	0.000	***
Female adults only	38.9	35.6-42.2	855	40.8	37.1-44.6	665	1.9	0.504	n/s
Male adults only	31.0	24.9-37.1	224	36.3	27.3-45.1	115	5.3	0.445	n/s
Children only	^	^	2	^	^	7	^	^	^
Household education									
No education	43.5	41.0-46.1	1,434	37.7	34.0-41.3	664	-5.8	0.026	*
Less than primary	39.4	37.4-41.3	2,412	33.7	31.7-35.7	2,153	-5.7	0.000	***
Completed primary	36.8	33.3-40.2	746	27.5	24.8-30.2	1,032	-9.3	0.000	***
Secondary or more	^	^	20	^	^	26	^	^	^
Household hunger									
Little to no hunger	39.2	37.7-40.6	4,378	31.3	29.8-32.8	3,747	-7.9	0.000	***
Moderate hunger	55.4	48.4-62.4	198	59.5	50.0-69.1	105	4.1	0.550	n/s
Severe hunger	58.9	41.5-76.3	34	^	^	23	^	^	^

^ 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 end-line estimates.

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

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

Estimates are based on 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.

Depth of Poverty

Depth of poverty for the Feed the Future ZOI in the end-line data using $1.25 and 2005 PPP is 12.2 percent (Table 4.3b). The decline is only a percentage point when compared with the baseline estimate.

The depth of poverty provides an indication of the amount of resource transfers that, if *perfectly* targeted to poor households, would be needed to bring everyone in the ZOI up to the poverty line. With a PI-ZOI population of 13.8 million (in adult equivalent units), a poverty threshold of $1.25 per person per day (2005 PPP), poverty head count of 32.3 and a poverty gap of 12.2 percent, $2,113,207 (2005 PPP) per day would need to be transferred to the poor to bring their income or expenditures up to the poverty threshold[13].

[13] Since the mean depth of poverty in the ZOI is 12.2 percent, the poverty threshold is $1.25/day, and the population is 13.8 million; the average daily cost of raising the income or consumption expenditures of the poor up to the poverty line is calculated as: [(12.2 ÷ 100) * $1.25/day] *13857097 = $2,113,207/day.

Table 4.3b: Comparison of depth of poverty at the $1.25 (2005 PPP) per person per day threshold in the PI-ZOI, in total and by selected household characteristics, Feed the Future phase one baseline and end-line ZOI Surveys

Characteristic	Baseline (2013) % of poverty line	Baseline (2013) 95% CI	Baseline (2013) n[a]	End-line (2018) % of poverty line	End-line (2018) 95% CI	End-line (2018) n[a]	Diff.	p-value[b]	Sig.[c]
All households	13.2	12.6-13.8	4,618	12.2	11.4-12.8	3,876	-1.0	0.054	n/s
Gendered household type									
Male and female adults	13.3	12.6-14.0	3,534	11.7	10.9-12.5	3,089	-1.6	0.010	*
Female adults only	13.2	11.7-14.6	855	15.8	13.9-17.6	665	2.6	0.058	n/s
Male adults only	9.7	7.3-12.1	224	12.5	8.5-16.4	115	2.8	0.279	n/s
Children only	^	^	2	^	^	7	^	^	^
Household education									
No education	14.6	13.4-15.7	1,434	15.7	13.8-17.7	664	1.1	0.381	n/s
Less than primary	13.2	12.4-14.1	2,412	12.5	11.5-13.4	2,153	-0.7	0.327	n/s
Completed primary	11.4	9.9-12.8	746	10.0	8.7-11.2	1,032	-1.4	0.212	n/s
Secondary or more	^	^	20	^	^	26	^	^	^
Household hunger									
Little to no hunger	12.8	12.2-13.4	4,378	11.6	10.9-12.3	3,747	-1.2	0.039	*
Moderate hunger	20.3	16.7-24.0	198	27.7	21.8-33.6	105	7.4	0.073	n/s
Severe hunger	31.7	21.0-42.4	34	^	^	23	^	^	^

^ 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 end-line estimates.

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

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

Estimates are based on 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 USD $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 USD $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.

Sources: Feed the Future Ethiopia ZOI Survey 2013; Feed the Future Ethiopia ZOI Survey 2018

The decline in the incidence of poverty was not replicated in the depth of poverty. The fall recorded in the latter is not statistically significant. Consumption expenditure rose significantly for households with male and female adults, with some formal education, and with little to no hunger experience. It did not for other household types. Correspondingly, these are also the household types which experienced reduction in poverty. In fact, depth of poverty also fell marginally for households with male and female adults and for those with little to no hunger experience. Thus, the pattern of poverty reduction largely left the depth of poverty unchanged.

4.2.3 The National Poverty Threshold

Table 4.4 presents poverty estimates at the national poverty threshold for Ethiopia. Similar to prior poverty tables, this table presents poverty estimates for all households in the P1-ZOI (excluding as before the Somali sub-sample), as well as disaggregated by characteristics, including gendered household type, household size and household educational attainment.

The source of the national poverty line is the 2016 national poverty interim report (NPC (September 2017)). The 2011 poverty line is 3781 Birr per adult equivalent per year 2011 prices. If we divide it by 365, we will get the daily national poverty line in 2011 prices to be 10.36 Birr.

Then, the only adjustment that is needed to arrive at the 2013 and 2018 poverty lines is to allow for annual inflation. Using the November 2018 retail price report, the cumulative inflation from 2011 to 2013 is 125.68 and from 2011 to 2018 is 180.1. With this adjustment we get the poverty line to be Birr13.02 and Birr18.66 per adult equivalent per day for 2013 and 2018, respectively.

Table 4.4 Total (absolute) poverty line in Birr (average price)

Year	1995/96	2010/11	2015/16
Absolute poverty line (Birr)	1075	3781	7184

Source: Computed using HICE survey 1995/96, 2010/11 and 2015/16 and MoFEC (2015).
Note: The absolute poverty lines for 2010/11 and 2015/16 are respectively in December 2005 and December 2011 prices (NPC (September 2017).

Poverty Prevalence

Based on the national poverty line of 18.66 Birr per adult equivalent per day, the prevalence of poverty is 30.0 percent at the end-line. The rate is less than that under the international poverty line because the national poverty line is slightly lower when converted into 2005 PPP prices. The conversion involves dividing the national poverty line in Birr by the product of the 2005 USD PPP for Ethiopia (= 2.75) and the CPI ratio 2018 CPI LCU/2005 CPI LCU (=5.68) – or the adjusted conversion factor of 15.62. The result is $1.19. Second, this poverty line implies that poverty in the ZOI declined by 6.4 percentage points during Feed the Future phase one – a change very close to that recorded using the international poverty line.

Table 4.5 compares the prevalence of poverty at the national threshold between the phase one baseline and end-line ZOI surveys. The table shows that poverty at the national threshold declined by over 6 percentage points, from the baseline estimate of 36.4 percent. This difference is statistically significant. Households with male and female adults experienced a statistically significant decline in the prevalence of poverty during the period.

Depth of Poverty

The overall depth of poverty is 11.3 percent (Table 4.5). The depth of poverty provides an indication of the amount of resource transfers that, if *perfectly* targeted to poor households, would be needed to bring everyone in the ZOI up to the poverty line. With a P1-ZOI population of 13.8 million (in adult equivalent units), a poverty threshold of Birr18.66 per adult equivalent per day, and a poverty gap of 11.3 percent, Birr 29,218,798 per day would need to be transferred to the poor to bring their income or expenditures up to the poverty threshold[14]. Given the 2005 PPP conversion factor for 2005 (2.75) and the inflation factor of 5.68, this amounts to $1,870,602 per day in 2005 PPP. The difference with the figure obtained above using the international poverty line of $1.25 is accounted for by the lower national poverty line and poverty gap, which led to the smaller average daily consumption shortfall of the poor which amount to $0.16 and $0.13 using the international and national poverty lines, respectively.

Table 4.5: Comparison of prevalence of poverty at the national threshold of 13.02 Birr (baseline) 18.66 Birr (end-line) in the PI-ZOI, in total and by selected household characteristics, Feed the Future phase one baseline and end-line ZOI Surveys

	Baseline (2013)			End-line (2018)					
Characteristic	%	95% CI	n[a]	%	95% CI	n[a]	Diff.	p-value[b]	Sig.[c]
All households	36.4	35.0-37.8	4,618	30.0	28.5 -31.4	3,876	-6.4	0.00	***
Gendered household type									
Male and female adults	36.8	35.2-38.4	3,534	29.0	27.4-30.6	3,089	-7.8	0.000	***
Female adults only	35.6	32.4-38.9	855	38.7	35.0-42.5	665	3.1	0.261	n/s
Male adults only	27.2	21.3-33.1	224	32.2	23.6-40.9	115	5.0	0.432	n/s
Children only	^	^	2	^	^	7	^	^	^
Household education									
No education	39.9	37.4-42.4	1,434	35.6	31.9-39.2	664	-4.3	0.098	n/s
Less than primary	36.3	34.4-38.2	2,412	31.3	29.3-33.2	2,153	-5.0	0.000	***
Completed primary	32.1	28.7-35.4	746	25.4	22.7-28.1	1,032	-6.7	0.006	**
Secondary or more	^	^	20	^	^	26	^	^	^
Household hunger									
Little to no hunger	35.6	34.2-37.0	4,378	29.1	27.6-30.5	3,747	-6.5	0.000	***
Moderate hunger	50.9	43.8-57.9	198	56.7	47.1-66.4	105	5.8	0.394	n/s
Severe hunger	58.9	41.5-76.3	34	^	^	23	^	^	^

Sources: Feed the Future Ethiopia ZOI Survey 2013; Feed the Future Ethiopia ZOI Survey 2018; National Planning commission

^ 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 end-line estimates.

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

Notes: Estimates are sample-weighted; numbers of observations are unweighted. Estimates are based on de jure household members.

[14] Since the mean depth of poverty in the ZOI is 11.3 percent, the poverty threshold is Birr18.66 per adult equivalent per day, and the population is 13.8 million in adult equivalent units; the average daily cost of raising the consumption expenditures of the poor up to the poverty line is calculated as: [(11.3 ÷ 100) * Birr18.66/day] *13857097 = Birr29,218,798 /day.

5. Hunger and Dietary Intake

This chapter presents findings related to hunger and the dietary intake of women and young children in the P1-ZOI.

5.1 Household Hunger

The household hunger scale (HHS) is used to calculate the prevalence of households in the Ethiopia P1-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. The HHS is used to assess, geographically target, monitor and evaluate settings affected by substantial food insecurity. 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 (i.e., right before the harvest, during the dry season, etc.).[15,16]

The hungry season in Ethiopia varies across the regions but generally occurs between May and September. The end-line data for the HHS were collected in September and early October.

Tables 5.1a and **5.1b** present estimates of household hunger for all households in the P1-ZOI, as well as by gendered household type and household educational attainment.

The hunger scale suggests low prevalence of hunger in Ethiopia. Only 3.3 percent of the households reported moderate or severe hunger. The prevalence of moderate and severe hunger is the highest for female only households and lowest for male and female adults households while it is observed to decline with educational attainment of households whereby the proportion of households with primary education that reported moderate or severe hunger is about one-quarter of the proportion of households with no education. The table also indicates that the prevalence of households that reported moderate or severe hunger declined by 1.6 percentage points in the end-line compared to the baseline estimate of about 5 percent or the prevalence of households that experienced moderate or severe hunger declined by 33 percent during the period. The proportion of male and female adults households that reported moderate or severe hunger declined relatively faster between the baseline and end-line. Furthermore, the decline in the prevalence of moderate or severe hunger between the baseline and end-line periods increases with educational attainment of households. The proportion that reported moderate or severe

[15] Deitschler, Ballard, Swindale & Coates (2011).

[16] For further description of the household hunger indicator and its calculation, please refer to the 2016 edition of the Feed the Future Indicator Handbook, available at https://www.agrilinks.org/post/feed-future-indicator-handbook.

hunger in the end-line was less than half the proportion in the baseline for households with primary education, it declined by about one-quarter for households with some primary education, while it changed little for households with no education.

It is clear that the extent of hunger implied by the HHS scores are rather low for rural Ethiopia. However, it is worth noting that the household hunger scale may not be an appropriate measure of food security in the Ethiopian context (see Maxwell, Coates and Vaitla 2013).

Table 5.1a. Comparison of household hunger in the PI-ZOI, by severity, in total and by selected household characteristics, Feed the Future phase one baseline and end-line ZOI Surveys

	Baseline (2013)				End-line (2018)			
Characteristic	Little to none (%)	Moderate (%)	Severe (%)	n[a]	Little to none (%)	Moderate (%)	Severe (%)	n[a]
All households	95.1	4.1	0.8	4,224	96.7	2.7	0.6	3,882
Gendered household type								
Male and female adults	96.3	3.2	0.6	3,235	97.5	2.2	0.3	3,105
Female adults only	90.8	7.7	1.5	776	93.2	5.3	1.5	661
Male adults only	93.0	6.0	1.0	209	93.4	3.8	2.8	116
Children only	^	^	^	2	^	^	^	7
Household education								
No education	93.5	5.4	1.1	1,217	93.8	4.9	1.3	670
Less than primary	95.5	3.8	0.7	2,251	96.8	2.7	0.6	2,158
Primary	96.5	3.0	0.6	731	98.4	1.4	0.2	1,034
Secondary or more	^	^	^	20	^	^	^	26

^ 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.

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

Sources: Feed the Future Ethiopia ZOI Survey 2013; Feed the Future Ethiopia ZOI Survey 2018

Table 5.1b. Comparison of household hunger between the Feed the Future phase one baseline and end-line ZOI Surveys

Characteristic	Baseline (2013) Moderate or severe (%)	95% CI	n[a]	End-line (2018) Moderate or severe (%)	95% CI	n[a]	Diff.	P-value[b]	Sig.[c]
All households	4.9	3.8-6.2	4,224	3.3	2.6-4.2	3,882	-1.6	0.019	**
Gendered household type									
Male and female adults	3.8	2.8-5.0	3,235	2.5	1.9-3.3	3,105	-1.3		
Female adults only	7.9	7.0-12.1	776	6.8	5.0-9.3	661	-1.1		
Male adults only	7.0	4.0-11.8	209	6.6	3.1-13.4	116	-0.4		
Children only	^	^	2	^	^	7	-		
Household education									
No education	6.5	4.5-9.3	1,217	5.2	4.2-9.1	670	-1.3		
Less than primary	4.5	3.4-5.8	2,251	3.3	2.4-4.3	2,158	-1.2		
Primary	3.6	2.3-5.4	731	1.6	1.0-2.6	1,034	-2.0		
Secondary or more	^	^	20	^	^	26	-		

^ 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.

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

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

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

5.2 Dietary Intake

This section presents information on the dietary diversity of women of reproductive age and on infant and young child feeding in the P1-ZOI.

5.2.1 Dietary Diversity among Women Age 15-49 Years

Women of reproductive age (15-49 years) 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 (c.f. Darnton-Hill et al. 2005). The Feed the Future women's dietary diversity indicator is a proxy for the micronutrient adequacy of women's diets. The dietary diversity indicator reports the mean number of food groups consumed in the day preceding the survey by non-pregnant women of reproductive age.

For the Feed the Future phase one end-line/baseline ZOI Survey analysis, two dietary diversity indicators for women are calculated: the Mean Women's Dietary Diversity Score (WDDS) and Women's Minimum Dietary Diversity (MDD-W).[17]

[17] The Feed the Future indicators list does not include MDD-W. It is added here to exploit the potential benefit due to its greater disaggregation. See next footnote.

Mean Women's Dietary Diversity Score

The Feed the Future mean WDDS indicator, presented in Table 5.2, is based on 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 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 5.2 shows the mean and median WDDS for all women of reproductive age in the P1-ZOI, and by individual- and household-level characteristics. Individual-level characteristics include women's age groups and educational attainment. Household-level characteristics include gendered household type, household size and household hunger.

Dietary diversity is extremely low in ZOI. An average woman of reproductive age consumed from 2.33 food groups in the previous day. Dietary diversity increases with education but only marginally. We see little difference in WDDS between different generations of women. The dietary diversity is slightly higher for medium sized households (6-10 members), for households reporting little or no hunger, and households composed of both female and male adults.

Table 5.2. Women's mean and median dietary diversity scores in the P1-ZOI

Characteristic	Mean		Median	n[1]
	Est.	95% CI		
All women of reproductive age	**2.33**	**2.24-2.41**	**2.00**	**3,956**
Age				
15-19	2.41	2.30-2.53	2.00	919
20-24	2.28	2.14-2.42	2.00	445
25-29	2.27	2.14-2.40	2.00	665
30-34	2.36	2.25-2.46	2.00	702
35-39	2.24	2.10-2.38	2.00	559
40-44	2.36	2.23-2.49	2.00	423
45-49	2.33	2.15-2.52	2.00	243
Educational attainment				
No education	2.22	2.13-2.31	2.00	2,257
Less than primary	2.44	2.32-2.56	2.00	1,139
Primary	2.59	2.41-2.77	3.00	337
Secondary or more	2.65	2.16-3.13	2.00	38
Gendered household type				
Male and female adults	2.35	2.27-2.44	2.00	3,476
Female adult(s) only	2.13	2.97-2.29	2.00	465
Male adult(s) only	^	^	^	10
Child(ren) only (no adults)	^	^	^	5
Household size				
Small (1-5 members)	2.22	2.11-2.32	2.00	1,687
Medium (6-10 members)	2.42	2.33-2.52	2.00	2,161
Large (11+ members)	2.18	1.61-2.74	2.00	108
Household hunger				
Little to no hunger	2.34	2.26-2.43	2.00	3,842
Moderate or severe hunger	1.78	1.50-2.06	2.00	114

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

^ Results not statistically reliable, n<30.

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

Women's Minimum Dietary Diversity

The Feed the Future MDD-W indicator uses the following 10 food groups: (1) grains, roots and tubers; (2) legumes and beans; (3) nuts and seeds; (4) dairy products; (5) eggs; (6) flesh foods, including organ meat and miscellaneous small animal protein; (7) vitamin A-rich dark green leafy vegetables; (8) other vitamin A-rich vegetables and fruits; (9) other fruits; and (10) other vegetables.[18] Achievement of women's minimum dietary diversity is defined as having consumed foods from 5 of the 10 food groups in the past 24 hours. Thus, this indicator is a dichotomous

[18] The differences between the nine food groups used for the WDDS (Table 5.2), the standard FTFMS indicator, and the 10 food groups used for the new MDD-W measure (Table 5.3) include: (1) legumes and beans are separated from nuts and seeds; (2) meat (flesh foods) and organ meat are combined into one group; and (3) other fruits and other vegetables are separated into two groups.

variable, and the measure is reported as the percentage of women who achieve a minimum dietary diversity.

Table 5.3 shows the percentage of all women of reproductive age in the P1-ZOI who have achieved the MDD-W threshold by individual-level and household-level characteristics. Individual-level characteristics include women's age and educational attainment. Household-level characteristics include of gendered household type, household size and household hunger. Close to 5 percent of women consume from 5 or more food groups. The following differences in MDD-W are observed. The proportion of households that attained the MDD-W increases with educational attainment of households. However, the proportion that attained dietary diversity remains extremely low even among the most educated women. The proportion of women in household that reported little or no hunger that achieved MDD-W is considerably higher relative to those in households with moderate or severe hunger.

Table 5.3. Percentage of women of reproductive age achieving minimum dietary diversity in the P1-ZOI

Characteristic	Percent		n[1]
	Est.	95% CI	
All women of reproductive age	**4.7**	**3.7-5.9**	**3,956**
Age			
15-19	5.1	3.6-7.3	919
20-24	5.7	4.0-8.2	445
25-29	5.1	3.6-7.3	665
30-34	3.7	2.5-5.3	702
35-39	4.0	2.4-6.6	559
40-44	4.2	2.6-6.9	423
45-49	5.3	3.0-9.3	243
Educational attainment			
No education	3.6	2.7-4.9	2,257
Less than primary	5.7	4.1-7.9	1,139
Primary	8.5	5.9-12.0	337
Secondary or more	10.3	4.0-14.1	38
Gendered household type			
Male and female adults	4.7	3.7-6.0	3,476
Female adult(s) only	4.6	2.7-7.7	465
Male adult(s) only	^	^	10
Child(ren) only (no adults)	^	^	5
Household size			
Small (1-5 members)	3.5	2.5-4.8	1,687
Medium (6-10 members)	5.5	4.3-7.0	2,161
Large (11+ members)	6.9	2.3-18.8	108
Household hunger			
Little to no hunger	4.8	3.8-6.0	3,842
Moderate or severe hunger	0.0	0.0-0.0	114

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

^ Results not statistically reliable, n<30.

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

Table 5.4 shows the percentages of women age 15-49 years who consumed each of the 9 WDDS food groups by dietary diversity achievement status. The percentage of all women who consumed each of the 9 food groups is shown (the "Overall" column), as well as the percentages among women who achieve a minimum dietary diversity and among women who do not achieve a minimum dietary diversity.

The consumption of animal source foods (dairy, organ meat and flesh foods) is much more prevalent among the women who achieved minimum dietary diversity. Similarly, women who achieved minimum dietary diversity are more likely to consume fruits and vegetables than those who did not achieve minimum dietary diversity. Grains, roots and tubers as well as legumes/nuts are prominent food categories among women.

Table 5.4. Percentage of women who consumed foods in the P1-ZOI, by achievement of minimum dietary diversity status

Food group	Percent					
	Achieved minimum dietary diversity		Did not achieve minimum dietary diversity		Overall	
	Est.	95% CI	Est.	95% CI	Est.	95% CI
Grains, roots and tubers	97.3	93.0-90.0	81.2	77.3-84.6	82.0	78.2-85.3
Legumes nuts	82.1	74.2-87.9	52.6	47.1-58.7	54.3	48.5-59.9
Dairy products	78.3	70.0-84.9	21.1	18.7-23.7	23.8	21.3-26.4
Organ meats	20.0	12.1-31.2	1.0	0.7-1.5	1.9	1.3-2.8
Eggs	53.3	44.1-62.2	4.6	3.7-5.7	6.9	5.7-8.2
Flesh foods and other misc. small animal protein	59.2	48.7-69.0	12.7	10.5-15.3	14.9	12.5-17.6
Vitamin A-rich dark green leafy vegetables	71.2	61.4-79.4	30.0	25.3-35.2	32.0	27.3-37.0
Other Vitamin A-rich vegetables and fruits	61.0	50.6-70.4	12.2	10.3-14.3	14.5	12.5-16.7
Other fruits and vegetables	27.0	19.5-36.0	2.2	1.6-3.1	3.4	2.5-4.5
n	**188**		**3,768**		**3.956**	

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

Table 5.5 compares the WDDS and MDD-W indicators between the Feed the Future phase one baseline and end-line ZOI Surveys. Women's dietary diversity score was 1.59 at the baseline while it increased to 2.33 in the end-line. This is an increase in WDDS of 46.5 percent, although starting from a very low base. Similarly, the percentage of women achieving minimum dietary diversity increased from less than 2 percent in the baseline to 4.6 percent at the end-line. That is, the proportion achieving MDD-W more than doubled during the period. Both of these changes are statistically significant.

Table 5.5. Comparison of women's dietary diversity between the Feed the Future phase one baseline and end-line ZOI Surveys

Characteristic	Baseline (2013)			End-line (2018)			p-value[b]	Sig.[c]
	Mean	95% CI	n[a]	Mean	95% CI	n[a]		
Women's Mean Dietary Diversity Score (Mean number of food groups consumed)								
All women of reproductive age	1.59	1.46-1.72	3,978	2.33	2.24-2.41	3,956	0.000	***
Woman's age								
15-19	1.73	1.54-1.91	798	2.41	2.30-2.53	919		
20-24	1.54	1.40-1.68	706	2.28	2.14-2.42	445		
25-29	1.58	1.43-1.72	900	2.27	2.14-2.40	665		
30-34	1.56	1.40-1.73	579	2.36	2.25-2.46	702		
35-39	1.53	1.38-1.68	525	2.24	2.10-2.38	559		
40-44	1.38	1.38-1.77	256	2.36	2.23-2.49	423		
45-49	1.55	1.35-1.75	223	2.33	2.15-2.52	243		
Woman's education								
No education	1.47	1.34-1.60	2,712	2.22	2.13-2.31	2,257		
Less than primary	1.79	1.64-1.93	933	2.44	2.32-2.56	1,139		
Primary	2.00	1.73-2.26	238	2.59	2.41-2.77	337		
Secondary or more	^	^	22	2.65	2.16-3.13	38		
Gendered household type								
Male and female adults	1.60	1.47-1.72	3,333	2.35	2.27-2.44	3,476		
Female adults only	1.57	1.39-1.74	605	2.13	2.97-2.29	465		
Male adults only	1.55	1.11-1.99	39	^	^	10		
Children only	^	^	1	^	^	5		
Women's Minimum Dietary Diversity (Percent of women achieving minimum dietary diversity)								
All women of reproductive age	1.8	1.2-2.9	3,978	4.7	3.7- 5.9	3,956	0.000	***
Woman's age								
15-19	3.1	1.6-5.9	789	5.1	3.6-7.3	919		
20-24	1.8	1.1-3.0	706	5.7	4.0-8.2	445		
25-29	1.8	1.0-3.2	900	5.1	3.6-7.3	665		
30-34	1.6	0.6-3.8	579	3.7	2.5-5.3	702		
35-39	1.5	0.7-3.2	525	4.0	2.4-6.6	559		
40-44	0.9	0.3-2.8	256	4.2	2.6-6.9	423		
45-49	0.4	0.1-2.7	223	5.3	3.0-9.3	243		
Woman's education								
No education	1.3	0.8-2.1	2,712	3.6	2.7-4.9	2,257		
Less than primary	2.4	1.3- 4.4	933	5.7	4.1-7.9	1,139		
Primary	5.7	3.2- 9.9	238	8.5	5.9-12.0	337		
Secondary or more	^	^	22	10.3	4.0-24.1	38		
Gendered household type								
Male and female adults	1.8	1.2-2.9	3,333	4.7	3.7-6.0	3,476		
Female adults only	1.8	0.7-4.8	605	4.6	2.7-7.7	465		
Male adults only	2.8	0.4-17.8	39	^	^	10		
Children only	^	^	1	^	^	5		

Source: Feed the Future Baseline Survey 2013, Ethiopia; Feed the Future End-line ZOI Survey, Ethiopia 2018.

[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 end-line estimates at the overall indicator level. A test of statistical significance in differences between the baseline and end-line estimates was conducted. A t-test of differences in means was used for WDDS, and a Pearson's chi-squared test of differences in proportions was used for MDD-W.

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

5.2.2 Infant and Young Child Feeding

This section presents young children's dietary intake measures, including the prevalence of exclusive breastfeeding among children 0-5 months and the prevalence of children 6-23 months consuming a minimum acceptable diet.

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. Exclusive breastfeeding means 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 who were exclusively breastfed during the day preceding the survey.

Table 5.6 shows the prevalence of exclusive breastfeeding among children 0-5 months in the P1-ZOI. Estimates are shown for all children, as well as by children's sex and by educational attainment of the child's primary caregiver. Note that the data are collected for the self-identified primary caregiver and not strictly for the biological mother, although it is often the same person.

Nearly three-quarters of all children aged 0-5 months are exclusively breastfed. The percentage is marginally higher for female children.

Table 5.6. Prevalence of exclusive breastfeeding among children 0-5 months in the P1-ZOI

Characteristic	Percent		n[1]
	Est.	95% CI	
All children 0-5 months	**74.5**	**63.4-83.1**	**111**
Child sex			
Male	73.9	58.9-84.8	57
Female	75.1	62.0-84.8	54
Caregiver educational attainment[2]			
No education	74.2	63.0-82.9	110
Less than primary	^	^	0
Primary	^	^	0
Secondary or more	^	^	0

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

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

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

Minimum Acceptable Diet (MAD)

The prevalence of children 6-23 months consuming a minimum acceptable diet (MAD) measures the proportion of young children who receive a MAD, taking their breastfeeding status into consideration. This composite indicator measures both the minimum feeding frequency and minimum dietary diversity based on caregiver reports of the frequency with which the child was fed and the foods that the child consumed during the 24 hours preceding the survey. Calculation of the indicator requires data on children's age in months, breastfeeding status, dietary diversity, number of semi-solid or solid feeds, and number of milk feeds.

Table 5.7 presents the Feed the Future MAD indicator for children 6-23 months in the P1-ZOI. Estimates are shown for all children, as well as by characteristics of the child, caregiver and household. Child characteristics include sex and age. Caregiver characteristics includes educational attainment. Household characteristics include gendered household type, household size and household hunger.

Less than 10 percent of the children aged 6-23 months received a MAD. A marginally higher percentage of female children received a MAD. A higher proportion of older children aged 18-23 months received a MAD, with the proportion of older children receiving a MAD about 50 percent and three times higher relative to children aged 12-17 and 6-11 months, respectively.

Table 5.7. Prevalence of children 6-23 months who receive a minimum acceptable diet in the P1-ZOI

Characteristic	Percent		n[1]
	Est.	95% CI	
All children 6-23 months	**8.4**	**6.4-11.0**	**639**
Child sex			
Male	7.5	5.0-11.1	324
Female	9.3	6.4-13.1	315
Child age			
6-11 months	3.9	1.7-8.3	184
12-17 months	8.7	5.8-12.8	273
18-23 months	12.4	8.3-18.1	182
Caregiver educational attainment[2]			
No education	8.4	6.4-11.0	637
Less than primary	^	^	2
Primary	^	^	0
Secondary or more	^	^	0
Gendered household type			
Male and female adults	8.4	6.3-11.1	591
Female adult(s) only	8.3	3.1-20.7	46
Male adult(s) only	^	^	1
Child(ren) only (no adults)	^	^	1
Household size			
Small (1-5 members)	7.6	4.7-12.0	225
Medium (6-10 members)	9.0	6.2-12.9	395
Large (11+ members)	^	^	19
Household hunger			
Little to no hunger	8.5	6.4-11.2	616
Moderate or severe hunger	^	^	23

Source: Feed the Future End-line ZOI Survey, Ethiopia 2018.

^ Results not statistically reliable, n<30.

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

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

Table 5.8 presents the percentages of children achieving the minimum meal frequency and minimum dietary diversity, as well as the percentages of children consuming each of the food groups included in the MAD indicator. Estimates are shown for all children, as well as by child's age, and are presented separately for breastfed children and non-breastfed children.

Table 5.8 shows that a large proportion (over 80 percent) of breastfed children are achieving the minimum meal frequency requirement but dietary diversity is extremely low among all children in the ZOI. The percentage of children who are not breastfed that achieved minimum meal

frequency requirement of MAD is less than 20 percent. Most of these children (both breastfed and non-breastfed) consume staples (grains, roots and tubers), but fruits and vegetables and animal source food consumption is low, especially meat and eggs.

Table 5.8.: Comparison of percent of children 6-23 months of age in the PI-ZOI achieving minimum feeding frequency, dietary diversity, and consuming specified foods, in total and by breastfeeding status and age, Feed the Future phase one baseline and end-line ZOI Surveys

Breastfeeding status and food group consumed	Baseline (2013)				End-line (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	41.2	28.7	45.1	48.1	75.1	66.2	81.8	73.7
Achieving minimum dietary diversity	3.5	3.2	2.6	4.8	11.1	7.3	10.0	16.6
Consuming:								
Grains, roots and tubers	40.2	28.9	41.6	49.1	61.4	49.4	62.8	71.4
Legumes and nuts	26.7	16.1	28.1	34.7	37.4	22.7	39.4	48.9
Dairy products	22.1	20.1	24.1	21.6	29.4	26.0	31.8	29.2
Flesh foods	1.9	2.4	1.0	2.5	13.6	8.2	13.4	19.3
Eggs	7.1	6.0	5.3	10.4	10.5	9.8	9.4	13.1
Vitamin A-rich fruits and vegetables	13.8	8.6	15.8	16.0	25.1	17.4	26.3	31.2
Other fruits and vegetables	3.2	1.9	4.6	2.8	5.8	6.6	5.1	6.0
Number of children	658	193	262	203	648	188	277	183
Breastfed children								
Achieving minimum meal frequency	44.0	29.4	47.1	55.6	81.2	68.4	86.8	86.7
Achieving minimum dietary diversity	3.4	3.3	2.8	4.4	11.1	7.5	9.2	18.1
Consuming:								
Grains, roots and tubers	38.8	28.2	40.5	47.8	60.2	49.3	61.8	70.1
Legumes and nuts	27.1	15.2	29.3	36.9	37.7	22.9	39.8	51.1
Dairy products	21.7	20.3	23.7	20.5	28.7	26.6	29.4	30.1
Flesh foods	1.6	2.2	1.0	1.8	14.1	8.5	13.4	21.7
Eggs	6.9	6.1	5.6	9.8	10.4	10.1	9.4	12.5
Vitamin A-rich fruits and vegetables	13.5	8.9	15.4	15.8	24.8	17.3	26.1	31.3
Other fruits and vegetables	3.4	2.0	4.8	3.0	6.0	6.8	5.1	6.4
Number of breastfed children	588	181	241	166	587	182	254	151
Non-breastfed children								
Achieving minimum meal frequency	7.5	^	^	8.6	13.3	^	^	6.9
Achieving minimum milk feeding frequency	7.5	^	^	8.6	15.0	^	^	6.9
Achieving minimum dietary diversity	4.7	^	^	7.2	11.8	^	^	8.9
Consuming:								
Grains, roots and tubers	57.8	^	^	55.7	74.2	^	^	78.0

Breastfeeding status and food group consumed	Baseline (2013)				End-line (2018)			
	All children	Child age (months)			All children	Child age (months)		
		6-11	12-17	18-23		6-11	12-17	18-23
Legumes and nuts	21.3	^	^	23.4	34.4	^	^	37.9
Dairy products	27.1	^	^	27.2	36.5	^	^	24.2
Flesh foods	5.4	^	^	6.3	8.7	^	^	7.1
Eggs	8.8	^	^	13.6	11.9	^	^	16.5
Vitamin A-rich fruits and vegetables	17.1	^	^	17.3	28.5	^	^	30.6
Other fruits and vegetables	1.2	^	^	1.9	3.8	^	^	3.6
Number of non-breastfed children	49	5	12	32	61	6	23	32

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.
^ Results not statistically reliable, n<30.

Table 5.9 compares the prevalence of exclusive breastfeeding among children 0-5 months and the prevalence of children 6-23 months receiving a MAD between the phase one baseline and end-line ZOI Surveys.

Although there is a marginal increase in the proportion of exclusively breastfed children (0-5 months) in the end-line relative to the baseline, the change is not statistically significant in both female and male children. There is an increase in the end-line of the proportion of children achieving a MAD from the baseline (from about 3 percent to 7 percent for male children and to 9 percent for female children). That is, the proportion that received a MAD more than doubled in both female and male children albeit from very low initial levels.

Table 5.9. Comparison of children's dietary intake between the phase one baseline and end-line ZOI Surveys

Characteristic	Baseline (2013)			End-line (2018)			p-value[b]	Sig.[c]
	%	95% CI	n[a]	%	95% CI	n[a]		
Exclusive breastfeeding children 0-5 months								
All children 0-5 months of age	72.2	65.3-78.3	204	74.5	63.5-83.0	111	0.709	n/s
Child's sex								
Male	71.5	61.5-79.7	96	73.9	58.9-84.8	57		
Female	72.9	62.2-81.4	108	75.1	62.0- 84.8	54		
Caregiver's education[d]								
No education	72.2	65.3-78.3	204	74.2	63.0-82.9	110		
Less than primary	^	^	0	^	^	0		
Primary	^	^	0	^	^	0		
Secondary or more	^	^	0	^	^	0		
Gendered household type								
Male and female adults	73.8	66.5-79.9	177	75.3	63.9-84.0	107		
Female adults only	^	^	20	^	^	3		
Male adults only	^	^	7	^	^	0		
Children only	^	^	0	^	^	0		
Minimum acceptable diet children 6-23 months								
All children 0-5 months of age	3.4	2.0-5.7	633	8.4	6.4-11.0	639	0.003	**
Child's sex								
Male	3.5	1.6-7.6	328	7.5	5.0-11.1	324		
Female	3.3	1.7-6.4	305	9.3	6.4-13.1	315		
Caregiver's education[d]								
No education	3.4	2.0-5.8	633	8.4	6.4-11.0	637		
Less than primary	^	^	0	^	^	2		
Primary	^	^	0	^	^	0		
Secondary or more	^	^	0	^	^	0		
Gendered household type								
Male and female adults	3.1	1.8-5.4	571	8.4	6.3-11.1	591		
Female adults only	2.1	0.3-13.9	52	8.3	3.1-20.7	46		
Male adults only	^	^	10	^	^	1		
Children only	^	^	0	^	^	1		

Source: Feed the Future Baseline Survey 2013, Ethiopia; Feed the Future End-line ZOI Survey, Ethiopia 2018.

[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 end-line estimates at the overall indicator level. A Pearson's chi-squared test of statistical significance in differences in proportions between the baseline and 2018-2019 estimates was conducted.

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

6. 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.

6.1 Body Mass Index of Women Age 15-49 Years

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 fatness, but BMI is not diagnostic of the body fatness or health of an individual. To determine if a high BMI is a health risk, a healthcare provider would need to perform further assessments.

Table 6.1 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 disaggregated by individual- and household-level characteristics. Individual characteristics include age and educational attainment. Household characteristics include gendered household type, household size and household hunger.

BMI of women of reproductive age averaged 20.3. The underweight prevalence is 22 percent while about 4 percent of the women were over-weight or obese. There exist little differences in average BMI and proportion of women in different BMI categories across age, educational achievement and other categories of women. For instance, although mean BMI appears to increase with age the difference between the highest and lowest mean BMIs is less than 0.7. Similarly, relative to women in households with moderate or severe hunger, the proportion underweight is higher and the proportion with normal weight is lower for those in households with no hunger.

Table 6.2 compares women's anthropometry results between the phase one baseline and end-line ZOI Surveys. The table indicate that there was a slight increase (0.23) in mean BMI of women in the end-line relative to the baseline. The prevalence of severely underweight women in the end-line is 1.5 percentage points lower than the baseline while the prevalence of underweight women in the end-line is 4 percentage points lower. The prevalence of over-weight and obese women in the end-line was no different from the baseline.

Table 6.1. Mean BMI and prevalence of underweight, normal weight, overweight, and obese women in the P1-ZOI

Characteristic	Mean BMI		BMI category (percent)								n[1]
			Under-weight		Normal weight		Over-weight		Obese		
	Est.	95% CI	Est.	95% CI	Est.	95% CI	Est.	95% CI	Est.	95% CI	
All non-pregnant women of reproductive age	**20.3**	**20.2-20.5**	**21.9**	**19.9-24.0**	**74.3**	**72.2-76.3**	**3.4**	**2.8-4.2**	**0.4**	**0.2-0.7**	**3,604**
Age											
15-19	20.0	19.7-20.2	27.3	23.4-31.5	69.6	65.5-73.5	2.9	1.9-4.3	0.2	0.1-0.9	903
20-24	20.5	20.2-20.8	18.0	13.9-23.0	78.0	72.9-82.5	4.0	2.5-6.3	0.0	0.0-0.0	407
25-29	20.4	20.2-20.6	21.5	18.0-25.5	75.0	70.8-78.8	3.2	2.0-5.1	0.3	0.1-1.3	562
30-34	20.4	20.2-20.7	18.5	15.3-22.3	77.5	73.6-80.9	3.3	2.1-5.1	0.7	0.3-1.9	597
35-39	20.6	20.4-20.9	19.0	15.5-23.1	76.4	72.0-80.2	4.0	2.5-6.3	0.6	0.2-1.9	504
40-44	20.4	20.1-20.7	21.8	17.0-27.5	74.6	68.5-79.8	2.9	1.6-5.4	0.7	0.2-2.3	393
45-49	20.3	20.0-20.7	23.9	18.2-30.8	70.9	64.0-77.0	4.6	2.4-8.5	0.6	0.1-3.8	238
Educational attainment											
No education	20.4	20.2-20.6	20.8	18.5-23.3	75.3	72.7-77.7	3.5	2.7-4.4	0.5	0.2-1.0	2,005
Less than primary	20.2	20.0-20.4	24.4	21.1-28.1	72.2	68.6-75.5	3.0	2.1-4.3	0.4	0.1-1.0	1,062
Primary	20.4	20.1-20.8	21.1	16.8-26.2	74.6	69.5-79.1	3.9	2.1-6.9	0.4	0.0-2.5	319
Secondary or more	21.4	20.6-22.2	18.2	8.7-34.2	78.7	62.9-89.0	3.1	0.4-18.5	0.0	0.0-0.0	37
Gendered household type											
Male and female adults	20.4	20.2-20.5	21.8	19.7-23.9	74.4	72.3-76.4	3.4	2.7-4.1	0.5	0.3-0.8	3,143
Female adult(s) only	20.2	20.0-20.5	22.2	18.3-26.6	74.0	69.5-78.0	3.8	2.3-6.3	0.0	0.0-0.0	446
Male adult(s) only	^	^	^	^	^	^	^	^	^	^	10
Child(ren) only (no adults)	^	^	^	^	^	^	^	^	^	^	5
Household size											
Small (1-5 members)	20.2	20.1-20.4	23.5	21.0-26.1	73.1	70.4-75.8	3.1	2.3-4.2	0.3	0.1-0.7	1,526
Medium (6-10 members)	20.4	20.3-20.6	20.4	18.1-22.9	75.5	73.0-77.9	3.6	2.8-4.6	0.4	0.2-0.8	1,981
Large (11+ members)	20.3	19.3-21.2	26.4	17.0-38.5	67.2	57.2-75.9	3.9	1.1-13.3	2.5	0.6-10.3	97
Household hunger											
Little to no hunger	20.3	20.2-20.5	22.1	20.1-24.3	74.0	71.9-76.0	3.4	2.8-4.2	0.4	0.2-0.7	3,495
Moderate or severe hunger	20.4	20.0-20.9	14.1	8.2-23.0	84.0	73.4-90.9	2.0	0.5-7.3	0.0	0.0-0.0	109

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

^ Results not statistically reliable, n<30.

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

Table 6.2 Comparison of the nutritional status of women between the Feed the Future phase one baseline and end-line ZOI Surveys

Characteristic	Baseline (2013)			End-line (2018)			p-value[b]	Sig.[c]
	%	95% CI	n[a]	%	95% CI	n[a]		
Average BMI								
All non-pregnant women of reproductive age	**20.1**	**20.0-20.3**	**3,517**	**20.3**	**20.2-20.5**	**3,604**	**0.007**	**
Woman's age								
15-19	19.9	19.7-20.2	742	20.0	19.7-20.2	903		
20-24	20.1	19.9-20.4	597	20.5	20.2-20.8	407		
25-29	20.3	20.1-20.5	747	20.4	20.2-20.6	562		
30-34	20.2	19.9-20.4	510	20.4	20.2-20.7	597		
35-39	20.2	20.0-20.5	470	20.6	20.4-20.9	504		
40-44	19.9	19.4-20.3	238	20.4	20.1-20.7	393		
45-49	20.0	19.6-20.4	213	20.3	20.0-20.7	238		
Woman's education								
No education	20.1	20.0-20.3	2,380	20.4	20.2-20.6	2,005		
Less than primary	20.0	19.8-20.2	837	20.2	20.0-20.4	1.062		
Primary	20.2	19.8-20.6	217	20.4	20.1-20.8	319		
Secondary or more	^	^	22	21.4	20.6-22.2	37		
Prevalence of severely underweight women (%)								
All non-pregnant women of reproductive age	**3.8**	**3.2-4.7**	**3,517**	**2.3**	**1.8-3.0**	**3,604**	**0.001**	**
Woman's age								
15-19	6.2	4.4-8.5	742	4.8	3.2-7.2	903		
20-24	3.0	1.8-5.0	597	1.6	0.8-3.3	407		
25-29	1.1	0.5-2.2	747	1.2	0.5-2.5	562		
30-34	3.7	2.3-5.9	510	2.0	1.1-3.5	597		
35-39	3.7	2.1-6.3	470	1.2	0.5-2.6	504		
40-44	5.6	3.3-9.1	238	1.0	0.4-2.4	393		
45-49	6.4	3.9-10.2	213	2.1	0.9-4.7	238		
Woman's education								
No education	3.7	2.9-4.7	2,380	1.7	1.2-2.4	2,005		
Less than primary	4.5	3.3-6.3	837	3.7	2.4-5.7	1,062		
Primary	3.5	1.7-6.9	217	2,4	1.2-4.8	319		
Secondary or more	^	^	22	0.0	0.0-0.0	37		
Prevalence of underweight women (%)[1]								
All non-pregnant women of reproductive age	**26.0**	**23.8-28.3**	**3,517**	**21.9**	**19.9-24.0**	**3,604**	**0.002**	**
Woman's age								
15-19	31.2	27.4-35.3	742	27.3	23.4-31.5	903		
20-24	22.7	19.2-26.6	597	18.0	13.9-23.0	407		
25-29	21.3	18.0-24.9	747	21.5	18.0-25.5	562		
30-34	24.0	20.1-28.3	510	18.5	15.3-22.3	597		
35-39	25.3	21.0-30.1	470	19.0	15.5-23.1	504		
40-44	34.0	27.7-40.9	238	21.8	17.0-27.5	393		
45-49	30.3	24.1-37.2	213	23.9	18.2-30.8	238		

Characteristic	Baseline (2013)			End-line (2018)			p-value[b]	Sig.[c]
	%	95% CI	n[a]	%	95% CI	n[a]		
Woman's education								
No education	25.7	23.3-28.3	2,380	20.8	18.5-23.3	2,005		
Less than primary	27.4	24.1-31.0	837	24.4	21.1-28.1	1,062		
Primary	24.7	19.1-31.4	217	21.1	16.8-26.2	319		
Secondary or more	^	^	22	18.2	8.7-34.2	37		
Prevalence of overweight women (%)								
All non-pregnant women of reproductive age	**3.0**	**2.4-3.8**	**3,517**	**3.4**	**2.8-4.2**	**3,604**	**0.409**	**n/s**
Woman's age								
15-19	2.9	1.8-4.5	742	2.9	1.9-4.3	903		
20-24	2.5	1.5-4.2	597	4.0	2.5-6.3	407		
25-29	2.4	1.5-3.9	747	3.2	2.0-5.1	562		
30-34	2.4	1.4-4.0	510	3.3	2.1-5.1	597		
35-39	3.8	2.4-5.8	470	4.0	2.5-6.3	504		
40-44	5.6	2.6-11.6	238	2.9	1.6-5.4	393		
45-49	4.2	2.2-7.9	213	4.6	2.4-8.5	238		
Woman's education								
No education	2.8	2.1-3.8	2,380	3.4	2.7-4.4	2,005		
Less than primary	3.6	2.5-5.2	837	3.0	2.1-4.3	1,062		
Primary	2.9	1.2-6.5	217	3.9	2.2-6.9	319		
Secondary or more	^	^	22	3.1	0.4-18.5	37		
Prevalence of obese women (%)								
All non-pregnant women of reproductive age	**0.4**	**0.2-0.8**	**3,517**	**0.4**	**0.2-0.7**	**3,604**	**0.786**	**n/s**
Woman's age								
15-19	1.2	0.6-2.4	742	0.2	0.1-0.9	903		
20-24	0.2	0.0-1.3	597	0.0	0.0-0.0	407		
25-29	0.1	0.0-0.5	747	0.3	0.1-1.2	562		
30-34	0.0	0.0-0.0	510	0.7	0.3-1.9	597		
35-39	0.0	0.0-0.0	470	0.6	0.2-1.9	504		
40-44	0.5	0.1-3.3	238	0.7	0.2-2.3	393		
45-49	0.7	0.2-2.9	213	0.6	0.1-3.8	238		
Woman's education								
No education	0.3	0.1-0.7	2,380	0.5	0.2-1.0	2,005		
Less than primary	0.4	0.1-1.1	837	0.4	0.1-1.0	1,062		
Primary	1.6	0.5-5.5	217	0.4	0.0-2.5	319		
Secondary or more	^	^	22	0.0	0.0- 0.0	37		

Source: Feed the Future Baseline Survey 2013, Ethiopia; Feed the Future End-line ZOI Survey, Ethiopia 2018.

[1] Prevalence of underweight women is a Feed the Future ZOI indicator.

[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 end-line estimates at the overall indicator level. A Pearson's chi-squared test of differences was used for proportions while a t-test of differences in means was used for continuous indicators.

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

6.2 Stunting, Wasting, Underweight among Children Under 5 Years

This section presents three indicators that rely on anthropometric measurements of children under five years in the P1-ZOI: stunting (low height-for-age), wasting (low weight-for-height) and underweight (low weight-for-age).

6.2.1 Stunting (Low Height-for-Age)

Stunting is an indicator of linear growth retardation, most often due to a prolonged inadequate diet and poor health. Reducing the prevalence of stunting among children, particularly age 0-23 months, is important because linear growth deficits accrued early in life are associated with cognitive impairments, poor educational performance and decreased work productivity as adults (c.f. Black et al. 2008, Victora et al. 2008). Stunting is a height-for-age measurement that reflects chronic undernutrition. This indicator measures the percentage of children 0-59 months 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.[19] The stunting measures presented below include the Feed the Future ZOI Survey indicator of stunting—moderate or severe (<-2 SD)—and the indicator for severe stunting (<-3 SD). Mean z-scores are also presented.

Table 6.3 shows the prevalence of stunting and severe stunting and mean height-for-weight z-scores for children under 5 years in the P1-ZOI. Estimates are presented for all children and by child, caregiver and household characteristics. Child characteristics include sex and age. Caregiver characteristics include educational attainment. Household characteristics include gendered household type, household size and household hunger.

Out of children of under 5 years of age nearly 39 percent are stunted, and 17.6 percent are severely stunted. Growth faltering occurs during the second 12 months of children whereby the proportion of children aged 12-23 months stunted and severely stunted is double the proportion aged 0-11 months. The HAZ score stabilizes after the second years of life. This is a typical pattern observed in many low-income countries.

The proportion of male and female children stunted is similar. The proportion of stunted children in households with moderate or severe hunger is 10 percentage points lower than those in households with little to no hunger, which appears to be counter intuitive. Similarly, the proportion stunted and severely stunted in households with larger family size is over 10 percentage points lower than those in medium and small family size.

[19] WHO. (2006).

Table 6.3. Prevalence of stunting and mean height-for-age z-scores among children under 5 years in the P1-ZOI

Characteristic	Percent				Mean z-score		n[1]
	Stunted (<-2 SD)		Severely stunted (<-3 SD)				
	Est.	95% CI	Est.	95% CI	Est.	95% CI	
All children under 5 years	**38.9**	**36.1-41.8**	**17.6**	**15.6-19.8**	**-1.4**	**-1.5- -1.2**	**1,963**
Child sex							
Male	38.8	34.9-42.8	17.2	14.6-20.1	-1.4	-1.5- -1.2	976
Female	39.0	35.8-42.3	18.0	15.8-20.5	-1.3	-1.5- -1.2	987
Child age							
0-11 months	19.6	14.5-25.9	8.3	5.2-13.0	-0.3	-0.5-0.0	234
12-23 months	41.0	35.8-46.4	17.8	14.0-22.3	-1.4	-1.6- -1.2	398
24-35 months	43.7	38.1-49.5	20.7	16.7-25.5	-1.5	-1.8- -1.3	406
36-47 months	42.1	37.0-47.5	18.7	15.3-22.5	-1.5	-1.7- -1.3	483
48-59 months	39.1	34.0-44.4	18.3	14.6-22.7	-1.5	-1.7- -1.4	442
Caregiver educational attainment[2]							
No education	38.8	36.0-41.7	17.5	15.5-19.7	-1.4	-1.5- -1.2	1,958
Less than primary	^	^	^	^	^	^	4
Primary	^	^	^	^	^	^	0
Secondary or more	^	^	^	^	^	^	0
Gendered household type							
Male and female adults	39.1	36.2-42.0	17.6	15.6-19.9	-1.4	-1.5- -1.2	1,808
Female adult(s) only	33.6	25.7-42.5	14.9	9.4-22.8	-1.1	-1.4- -0.8	137
Male adult(s) only	^	^	^	^	^	^	15
Child(ren) only (no adults)	^	^	^	^	^	^	2
Household size							
Small (1-5 members)	39.9	35.9-44.1	16.1	13.3-19.3	-1.5	-1.6- -1.3	676
Medium (6-10 members)	38.9	35.4-42.5	19.1	16.7-21.8	-1.4	-1.5- -1.2	1,229
Large (11+ members)	26.5	15.2-42.0	5.8	2.1-15.0	-0.3	-1.0-0.4	57
Household hunger							
Little to no hunger	39.2	36.3-42.1	17.6	15.6-19.9	-1.4	-1.5- -1.2	1,901
Moderate or severe hunger	28.4	18.7-40.7	17.2	8.9-30.5	-1.1	-1.6- -0.7	61

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

^ Results not statistically reliable, n<30.

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

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

6.2.2 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 who are acutely malnourished, as

defined by a weight-for-height z-score[20] more than 2 SDs below the median of the 2006 WHO Child Growth Standard, in the P1-ZOI. The wasting measures presented below include the Feed the Future ZOI Survey indicator of wasting—moderate or severe (<-2SD), the indicator for severe wasting (<-3SD), and the percentage of children who are overweight (>-2SD) and obese (>-3SD). Mean z-scores are also presented.

Table 6.4 shows the prevalence of wasting, severe wasting, and mean weight-for-height z-scores for children under 5 years in the P1-ZOI. The table also shows the prevalence of overweight and obese children under 5 years, as calculated using their weight-for-height z-scores, in the P1-ZOI. Estimates are presented for all children and by child, caregiver and household characteristics. Child characteristics include sex and age. Caregiver characteristics include educational attainment. Household characteristics include gendered household type, household size and household hunger.

Out of all children under 5 years of age, 9.7 percent are wasted, 3.7 percent are severely wasted, 2.7 percent are overweight, and 1 percent obese. The prevalence of wasting is generally higher among children under 2 years of age relative to those 2 years or older. Moreover, the proportion of female children wasted is slightly (2.5 percentage points) lower than males while the proportion in households with only female adults is 3.5 percentage points higher than those in households with male and female adults. The proportion of children in households with moderate and severe hunger that are wasted is about twice the proportion in households with little to no hunger, respectively.

[20] 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.

Table 6.4. Prevalence of wasting and mean weight-for-height z-scores among children under 5 years in the P1-ZOI

Characteristic	Percent								Mean z-score		n[1]
	Wasted		Severely wasted (<-3 SD)		Overweight (> +2SD)		Obese (> +3SD)				
	Est.	95% CI	Est.	95% CI	Est.	95% CI	Est.	95% CI	Est.	95% CI	
All children under 5 years	**9.7**	**7.8-12.0**	**3.7**	**2.7-5.0**	**2.7**	**2.0-3.7**	**1.0**	**0.7-1.7**	**-0.3**	**-0.4- -0.2**	**1,916**
Child sex											
Male	11.0	8.7-13.9	4.9	3.6-6.8	2.5	1.7-3.6	0.9	0.4-1.7	-0.3	-0.4- -0.2	950
Female	8.4	6.3-11.2	2.4	1.5-3.9	3.0	1.9-4.5	1.2	0.7-2.3	-0.2	-0.4- -0.1	966
Child age											
0-11 months	13.3	9.0-19.2	6.5	3.5-11.9	7.8	5.2-11.5	3.5	1.9-6.4	-0.2	-0.5-0.1	221
12-23 months	12.2	9.4-15.6	3.2	1.9-5.4	2.3	1.0-5.1	0.9	0.3-2.4	-0.4	-0.5- -0.2	391
24-35 months	7.5	4.7-11.8	3.1	1.5-6.2	2.7	1.4-5.0	0.5	0.1-2.0	-0.1	-0.3-0.0	396
36-47 months	7.7	5.1-11.4	4.2	2.6-6.7	2.8	1.6-5.0	1.1	0.5-2.7	-0.2	-0.4- -0.1	479
48-59 months	10.0	7.1-13.7	2.7	1.5-4.9	0.2	0.0-1.6	0.2	0.0-1.6	-0.4	-0.5- -0.2	429
Caregiver's educational attainment[2]											
No education	9.7	7.8-12.0	3.7	2.7-5.0	2.7	2.0-3.7	1.0	0.6-1.6	-0.3	-0.4- -0.2	1,913
Less than primary	^	^	^	^	^	^	^	^	^	^	2
Primary	^	^	^	^	^	^	^	^	^	^	0
Secondary or more	^	^	^	^	^	^	^	^	^	^	0
Gendered household type											
Male and female adults	9.5	7.6-11.8	3.7	2.7-5.0	2.9	2.1-4.0	1.1	0.7-1.8	-0.2	-0.3- -0.1	1,763
Female adult(s) only	12.9	7.7-20.8	3.7	1.6-8.5	0.7	0.0-4.9	0.0	0.0-0.0	-0.5	-0.8- -0.3	136
Male adult(s) only	^	^	^	^	^	^	^	^	^	^	15
Child(ren) only (no adults)	^	^	^	^	^	^	^	^	^	^	1
Household size											
Small (1-5 members)	8.0	6.0-10.6	2.6	1.6-4.1	2.4	1.4-4.1	1.3	0.6-2.4	-0.2	-0.4- -0.1	658
Medium (6-10 members)	10.4	7.9-13.5	4.1	2.8-6.0	2.8	2.0-3.9	0.8	0.4-1.5	-0.3	-0.4- -0.1	1,205
Large (11+ members)	16.3	7.0-33.6	8.3	3.5-18.5	5.1	1.2-19.0	3.7	0.9-14.5	-0.5	-1.0-0.1	52
Household hunger											
Little to no hunger	9.5	7.6-11.7	3.6	2.7-5.0	2.7	2.0-3.7	1.1	0.7-1.7	-0.3	-0.4- -0.2	1,858
Moderate or severe hunger	17.8	10.0-29.7	5.1	1.8-13.7	3.2	0.8-11.4	0.0	0.0-0.0	-0.1	-0.5- -0.4	57

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

^ Results not statistically reliable, n<30.

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

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

6.2.3 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 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 Standard. The underweight measures presented below include the Feed the Future phase one ZOI Survey indicator of underweight—moderate or severe (<-2 SD), the indicator for severe underweight (<-3 SD), and mean weight-for-age z-scores.

Table 6.5 shows the prevalence of underweight, severe underweight and mean weight-for-age z-scores for children under 5 years in the P1-ZOI. Estimates are presented for all children and by child, caregiver and household characteristics. Child characteristics include sex and age. Caregiver characteristics include educational attainment. Household characteristics include gendered household type, household size and household hunger.

Out of children under 5 years of age, 22.5 percent are underweight and 7 percent severely underweight. The proportion underweight is the lowest (15 percent) among children aged 0-11 months, the highest (25 percent) among 12-23-month-olds and stabilizes after 2 years of age. Households with large family size have the highest proportion of underweight (27.5 percent) and severely underweight (21 percent) children and these proportions are over 50 percent and four times higher than the respective proportions for households with small family size.

Table 6.5. Prevalence of underweight and mean weight-for-age z-scores among children under 5 years in the P1-ZOI

Characteristic	Percent				Mean z-score		n[1]
	Underweight (<-2 SD)		Severely underweight (<-3 SD)				
	Est.	95% CI	Est.	95% CI	Est.	95% CI	
All children under 5 years	**22.5**	**20.5-24.6**	**7.1**	**5.8-8.6**	**-1.0**	**-1.1- -0.9**	**2,153**
Child sex							
Male	23.9	21.1-26.7	8.0	6.3-10.1	-1.0	-1.1- -0.9	1,071
Female	21.1	18.7-23.7	6.2	4.7-8.1	-1.0	-1.1- -0.9	1,082
Child age							
0-11 months	14.8	10.8-20.0	5.9	3.4-9.8	-0.3	-0.5-0.0	273
12-23 months	25.3	21.5-29.5	7.8	5.8-10.5	-1.0	-1.2- -0.9	450
24-35 months	22.1	18.2-26.5	6.9	4.6-10.2	-1.0	-1.1- -0.8	442
36-47 months	22.3	18.9-26.0	7.7	5.7-10.3	-1.1	-1.2- -1.0	516
48-59 months	24.8	21.2-28.9	6.6	4.6-9.4	-1.3	-1.4- -1.2	472
Caregiver's educational attainment[2]							
No education	22.5	20.5-24.6	7.1	5.8-8.7	-1.0	-1.1- -0.9	2,148
Less than primary	^	^	^	^	^	^	4
Primary	^	^	^	^	^	^	0
Secondary or more	^	^	^	^	^	^	0
Gendered household type							
Male and female adults	22.1	20.2-24.2	6.9	5.6-8.5	-1.0	-1.1- -0.9	1,976
Female adult(s) only	24.5	17.9-32.5	7.9	4.5-13.4	-1.2	-1.4- -1.0	157
Male adult(s) only	^	^	^	^	^	^	17
Child(ren) only (no adults)	^	^	^	^	^	^	2
Household size							
Small (1-5 members)	18.0	15.2-21.3	4.8	3.4-6.7	-1.0	-1.1- -0.8	732
Medium (6-10 members)	24.6	22.0-27.4	7.6	6.1-9.4	-1.0	-1.1- -0.9	1,346
Large (11+ members)	27.5	16.4-42.4	21.0	11.5-35.1	-0.9	-1.6- -0.3	74
Household hunger							
Little to no hunger	22.5	10.5-24.6	7.2	5.9-8.8	-1.0	-1.1- -0.9	2,084
Moderate or severe hunger	20.7	13.5-30.5	4.1	1.4-11.1	-0.8	-1.1- -0.4	68

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

^ Results not statistically reliable, n<30.

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

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

Table 6.6 compares children's anthropometry results between the phase one baseline and end-line ZOI Surveys.

Table 6.6 indicates that all children's anthropometry measures showed considerable improvement in the end-line relative to the baseline. The prevalence of stunted children under 5 years of age is 11.5 percentage points lower in the end-line than in the baseline or the prevalence of stunting declined by 23 percent during the period. Similarly, the proportion of wasted children in the end-line was 4.4 percentage points less than the proportion in the baseline, and this was a decline of 31 percent in the prevalence of wasting during the period. Moreover, the proportion of underweight children in the end-line was 9 percentage points less than that in the baseline or the prevalence of underweight children declined by 28.6 percent during the period.

Table 6.6 Comparison of the nutritional status of children between the Feed the Future phase one baseline and end-line ZOI Surveys

Characteristic	Baseline (2013)			End-line (2018)			p-value[b]	Sig.[c]
	%	95% CI	n[a]	%	95% CI	n[a]		
Prevalence of stunted children under 5 years								
All children under 5 years of age	50.3	47.1-53.5	1,553	38.9	36.1-41.8	1,962	0.000	***
Child's sex								
Male	52.9	48.7-57.1	778	38.8	34.9-42.8	976		
Female	47.7	43.6-51.8	775	39.0	35.8-42.3	987		
Child's age								
0-11 months	39.8	29.6-50.9	106	19.6	14.5-25.9	234		
12-23 months	52.0	46.0-57.9	274	41.0	35.8-46.4	398		
24-35 months	53.3	47.1-59.4	331	43.7	38.1-49.5	406		
36-47 months	52.9	48.0-57.7	406	42.1	37.0-47.5	483		
48-59 months	47.0	41.2-53.0	436	39.1	34.0-44.4	442		
Woman's education								
No education	50.4	47.1-53.6	1,551	38.8	36.0-41.7	1,958		
Less than primary	^	^	1	^	^	4		
Primary	^	^	0	^	^	0		
Secondary or more	^	^	0	^	^	0		
Gendered household type								
Male and female adults	50.2	46.7-53.6	1,360	39.1	36.2-42.0	1,808		
Female adults only	50.8	42.3-59.3	162	33.6	25.7-42.5	137		
Male adults only	54.0	36.4-70.6	31	^	^	15		
Children only	^	^	0	^	^	2		
Prevalence of wasted children under 5 years								
All children under 5 years of age	14.1	11.9-16.6	1,471	9.7	7.8-12.0	1,916	0.010	*
Child's sex								
Male	14.3	11.8-17.3	733	11.0	8.7-13.9	950		
Female	13.9	11.1-17.2	738	8.4	6.3-11.2	966		
Child's age								

Characteristic	Baseline (2013)			End-line (2018)			p-value[b]	Sig.[c]
	%	95% CI	n[a]	%	95% CI	n[a]		
0-11 months	14.9	9.0-23.5	97	13.3	9.0-19.2	221		
12-23 months	13.8	9.4-19.8	257	12.1	9.4-15.6	391		
24-35 months	13.5	9.5-18.9	318	7.5	4.7-11.8	396		
36-47 months	14.9	11.7-18.9	386	7.7	5.1-11.4	479		
48-59 months	13.7	9.9-18.6	413	10.0	7.1-13.7	429		
Woman's education								
No education	14.1	11.9-16.6	1,469	9.7	7.8-12.0	1,913		
Less than primary	^	^	1	^	^	2		
Primary	^	^	0	^	^	0		
Secondary or more	^	^	0	^	^	0		
Gendered household type								
Male and female adults	14.1	11.8-16.9	1,292	9.5	7.6-11.8	1,763		
Female adults only	12.5	8.1-18.9	151	12.9	7.8-20.7	136		
Male adults only	^	^	28	^	^	15		
Children only	^	^	0	^	^	1		
Prevalence of underweight children under 5 years								
All children under 5 years of age	31.5	28.6-34.6	2,102	22.5	20.5-24.6	2,153	0.000	***
Child's sex								
Male	32.2	29.1-35.3	1,050	23.9	21.2-26.7	1,071		
Female	30.9	26.9-35.3	1,052	21.1	18.8-23.7	1,082		
Child's age								
0-11 months	28.7	21.4-37.2	163	14.8	10.8-20.0	273		
12-23 months	33.2	28.6-38.3	397	25.3	21.5-29.5	450		
24-35 months	33.0	28.4-37.9	478	22.1	18.2-26.5	442		
36-47 months	31.0	26.9-35.5	534	22.3	18.9-26.0	516		
48-59 months	30.4	26.1-35.0	530	24.8	21.2-28.9	472		
Woman's education								
No education	31.6	28.7-34.7	2,099	22.5	20.5-24.6	2,148		
Less than primary	^	^	1	^	^	4		
Primary	^	^	0	^	^	0		
Secondary or more	^	^	0	^	^	0		
Gendered household type								
Male and female adults	31.8	28.8-35.0	1,866	22.1	20.2-24.2	1,976		
Female adults only	29.2	22.9-36.3	199	24.5	17.9-32.5	157		
Male adults only	29.5	16.3-47.4	37	^	^	17		
Children only	^	^	0	^	^	2		

Source: Feed the Future Baseline Survey 2013, Ethiopia; Feed the Future End-line ZOI Survey, Ethiopia 2018.

[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, subsamples may not total to the aggregate sample size.

[b] A Pearson's chi-squared test of statistical significance in differences in proportions between the baseline and 2018-2019 estimates was conducted.

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

7. Women's Empowerment in Agriculture

This chapter presents findings related to the WEAI. Although women play a prominent role in agriculture, they face persistent economic and social constraints. Because of this, women's empowerment is a main focus of Feed the Future. Empowering women is particularly important to achieving the Feed the Future objectives of inclusive agriculture sector growth and improved nutritional status. The WEAI was originally developed to track the change in women's empowerment that occurs as a direct or indirect result of interventions under Feed the Future and as a programming tool to identify and address the constraints that limit women's full engagement in the agriculture sector.[21] Data to calculate the WEAI was collected in both the Feed the Future Ethiopia phase one baseline and end-line ZOI Surveys. All the results related to the WEAI are presented here.

7.1 Overview

The WEAI measures empowerment across five domains, which are presented in Table 7.1, together with their definitions, corresponding empowerment indicators and what it means to achieve adequacy in each empowerment indicator. The *Production* domain reflects individuals' ability to provide input and autonomously make decisions about agricultural production. The *Resources* domain reflects individuals' ownership of productive resources and input into decisions related to credit. The *Income* domain reflects individuals' ability to direct the financial resources derived from productive economic activities and durable goods. The *Leadership* domain reflects individuals' social capital and comfort speaking in public within their community. The *Time* domain reflects individuals' workload and satisfaction with leisure time. An individual is identified as "empowered" by WEAI if he or she achieves adequacy in at least 80 percent of the weighted indicators (equivalent to four out of five domains).

[21] Alkire, S. Malapit, H., et al. (2013).

Table 7.1 WEAI domains, indicators and definitions of adequacy

Domain	Definition of domain	Indicators	Percent with adequate achievement
Production	Sole or joint decision-making over food and cash crop farming, livestock, and fisheries, and autonomy in agricultural production	Input in productive decisions	Respondents have at least some input into or can make own personal decisions in at least two decision-making areas
		Autonomy in production	Respondent has an RAI (Relative Autonomy Indicator)[22] greater than 1 in at least one of the four areas of decision-making.
Resources	Ownership, access to and decision-making power over productive resources such as land, livestock, agricultural equipment, consumer durables and credit	Ownership of assets	Respondents own alone or jointly at least two small assets or one large asset.
		Purchase, sale or transfer of assets	Respondents decide to sell, give away or rent at least one asset, but not only chickens and non-mechanized farming equipment
		Access to and decisions on credit	Respondents decide alone or jointly whether to borrow or what to do with the money or item borrowed.[1]
Income	Sole or joint control over income and expenditures	Control over use of income	Respondents have some input into decisions on income, but not only minor household expenditures
Leadership	Membership in economic or social groups and comfort in speaking in public	Group member	Respondents are active members of at least one group in their community.[2]
		Speaking in public	Respondents feel comfortable speaking in at least one public setting
Time	Allocation of time to productive and domestic tasks and satisfaction with the available time for leisure activities	Workload	Respondents spend less than 10.5 hours performing work activities in a 24-hour period.[3]
		Leisure	Respondents rate satisfaction level as at least five out of 10

[1] Respondents who live in households that did not access credit are considered inadequate on access to credit and decisions on credit.

[2] 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.

[3] Respondents who reported the 24 hours preceding the survey to being an atypical workday are excluded.

The WEAI aggregates information collected for each domain into a single empowerment index indicator. The index comprises two sub-indices: the Five Domains of Empowerment Index (5DE), which measures the empowerment of women across the five WEAI domains, and the Gender Parity Index (GPI), which measures the relative empowerment of men and women within the household. The WEAI is computed as a weighted sum of the 5DE and GPI.

The WEAI survey module is administered to the male primary adult decision-maker and the female primary adult decision-maker in each household so that the 5DE profiles of women and men in the same household can be compared. The primary adult decision-makers are individuals

[22] The Relative Autonomy Indicator (RAI) measures the ability of a person to act on what he or she values, to have his or her own intrinsic motivations prevail over motivations to please others or avoid punishment, for example. This indicator probes the person's own understanding of the situation and enables the respondent to easily explain the different motivations that influence activities (Alkire 2007).

age 18 or older who self-identify as the primary decision-makers during the collection of the household roster information.[23] There can only be one female and one male primary adult decision-maker in each household; however, a household can have only a female primary adult decision-maker or only a male primary adult decision-maker. If there are no adults 18 or older in the household, the household will not have any primary adult decision-makers. The questionnaire for the WEAI section is administered separately to the primary and secondary respondent, where the primary respondent in this case refers to the primary female decision-maker age 18 or older. We have a total of 3,252 female adult decision-makers and 2,527 male adult decision-makers (secondary respondent).

This chapter presents findings on the WEAI, the 10 WEAI empowerment indicators, and the two WEAI sub-indices. Appendix 2.3 presents more information on the WEAI, including the survey questions that are used to elicit the data required to establish adequacy for each WEAI empowerment indicator and the adequacy criteria definitions for each WEAI empowerment indicator. For additional details refer to IFPRI (2013).[24]

Section 7.1 includes an overview of the empowerment results: 1) achievement of adequacy for each WEAI empowerment indicator; 2) 5DE, GPI and WEAI scores; and 3) contribution of each WEAI empowerment indicator to the disempowerment of women and men. Subsequent sections in this chapter present more detailed results by empowerment domain.

Table 7.2a and **Table 7.2b** present the average percentage of women and men who are disempowered and achieving adequacy in the 10 WEAI indicators at both baseline and at end-line using censored headcounts. The purpose of reporting on the average percentage of women who are disempowered achieving adequacy across the 10 WEAI indicators overall, which is a Feed the Future context indicator, and for the individual indicators is two-fold: to bring greater attention to the composition of empowerment and disempowerment, and to identify the individual indicators that present the greatest constraints to empowerment for women and men.

On average, 39 percent of female primary adult decision-makers are disempowered and achieved adequacy in the 10 WEAI indicators during the end-line. The corresponding figure (24 percent) is lower for male primary adult decision-makers. Relative to non-youths, a higher proportion of both female and male youth (18-29-year-olds) are disempowered and achieved adequacy in the 10 WEAI indicators.

Table 7.2a: Comparison of average percent of primary adult decision-makers in the PI-ZOI achieving adequacy in the 10 WEAI indicators, using censored

[23] The respondents to the WEAI survey module are only the primary adult decision-makers in the household and, therefore, may not be representative of the entire female and male populations in the surveyed area.

[24] IFPRI (2013). https://www.feedthefuture.gov/the-womens-empowerment-in-agriculture-index/.

headcounts, by sex and age, Feed the Future phase one baseline and end-line ZOI Surveys

WEAI indicator	Baseline (2013) %	95% CI	n	End-line(2018) %	95% CI	n
Women[c]						
Average[d]	40	38-42	3,466	39	39-39	3,251
Age category						
18-29	39	37-42	1,247	40	40-40	647
30+	40	38-41	2,219	38	38 -38	2,604
Men[e]						
Average[d]	32	29-34	2,998	24	24-24	2,542
Age category						
18-29	35	32-37	682	32	32-32	270
30+	31	28-33	2,316	23	23-23	2,272

Notes: 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 10 indicators of the WEAI," is calculated as the sum of the censored headcount ratios for primary adult female decision-makers for each of the 10 WEAI indicators, divided by 10 (the number of indicators.) It shows the average across the 10 indicators of proportion of primary adult female decision-makers in the ZOI population who are disempowered but still achieved adequacy in an individual WEAI indicator.

Table 7.2b presents the censored headcount ratios of individuals achieving adequacy in the 10 WEAI indicators, disaggregated by sex and age.

The proportion of women who are not yet empowered but have adequate achievement is higher relative to men during the end-line for all WEAI indicators except speaking in public and for the most part, this pattern holds for both age groups as well as during the baseline. The results indicate that primary women decision-makers have adequacy levels of higher than 50 percent during the end-line in control over use of income, input in productive decisions, ownership of assets, purchase and sale or transfer of assets, and autonomy in production. Primary men adult decision-makers have adequacy levels of less than 50 percent in indicators. Both primary men and women adult decision-makers had the lowest achievement in access to and input into decisions on credit.

Table 7.2b: Comparison of adequate achievement in each WEAI indicator in PI-ZOI using censored headcount ratios, by sex and age, Feed the Future phase one baseline and end-line ZOI Surveys

WEAI indicator and characteristic	Baseline (2013)			End-line (2018)			Diff.
	%	95% CI	n	%	95% CI	n	
Women							
Input in productive decisions	67.1	65.1-68.3	2,178	63.4	61.7-65.2	1,943	-3.7
Age category							
18-29	66.7	63.8-69.2	794	64.8	61.1-68.7	397	-1.9
30+	67.3	64.8-68.8	1,384	63.1	61.6-65.4	1,546	-4.2
Ownership of assets	55.7	53.6-57.0	1,806	62.6	60.5-63.9	1,906	6.9
Age category							
18-29	55.5	52.2-57.8	657	67.1	62.7-70.2	407	11.6
30+	55.8	53.3-57.6	1,149	61.5	59.6-63.5	1,499	5.7
Access to and decisions on credit	5.9	5.1-6.7	193	11.1	9.4-11.6	322	5.2
Age category							
18-29	6.1	4.6-7.2	71	14.2	10.4-15.7	80	8.1
30+	5.8	4.9-6.9	122	10.3	8.7-11.1	242	4.5
Control over income	67.3	65.4-68.6	2,187	63.9	62.3-65.7	1,959	-3.4
Age category							
18-29	68.7	65.6-70.9	815	67.2	63.6-71.0	412	-1.5
30+	66.6	64.2-68.3	1,372	63.2	61.6-65.5	1,547	-3.4
Group membership	28.2	27.0-30.1	933	22.3	21.0-23.9	689	-5.9
Age category							
18-29	27.7	26.1-31.2	342	22.2	19.2-25.8	138	-5.5
30+	28.4	26.6-30.5	591	22.3	20.9-24.3	551	-6.1
Workload	35.2	33.5-36.7	1,148	42.3	40.9-44.5	1,309	7.1
Age category							
18-29	31.7	29.3-34.6	382	37.7	34.6-42.4	236	6
30+	37.3	34.9-39.1	766	43.5	42.1-46.1	1,073	6.2
Autonomy in production	54	52.6-56.0	1,773	52.7	50.5-54.1	1,602	-1.3
Age category							
18-29	53.5	51.5-57.2	649	56.9	52.9-60.8	348	3.4
30+	54.3	51.5-57.2	1,124	51.7	49.5-53.5	1,254	-2.6
Purchase, sale or transfer of assets	52.7	50.3-53.7	1,699	61.3	59.0-62.5	1,860	8.6
Age category							
18-29	50.6	46.9-52.6	594	64.4	59.7-67.4	389	13.8
30+	53.9	51.2-55.5	1,105	60.5	58.5-62.4	1,471	6.6
Speaking in public	31.2	30.2-33.4	1,039	27.2	26.4-29.6	857	-4
Age category							
18-29	29.8	28.3-33.5	369	30.3	27.5-34.9	191	0.5
30+	32.0	30.3-34.4	670	26.4	25.6-29.1	666	-5.6
Leisure	32.7	30.5-33.8	1,051	20.6	19.3-22.2	635	-12.1
Age category							
18-29	36.5	32.9-38.4	426	23.6	21.4-28.3	152	-12.9
30+	30.1	28.2-32.2	625	19.9	18.3-21.4	483	-10.2
Men							
Input in productive decisions	57.9	55.4- 58.9	1,656	41.9	40.6-44.5	1,054	-16
Age category							
18-29	62.4	58.6-66.1	408	52	47.3-59.5	139	-10.4

30+	56.6	53.6-57.7	1,248	40.7	39.2-43.3	915	-15.9
Ownership of assets	40.5	38.4-42.0	1,165	36.9	35.7-39.5	931	-3,6
Age category							
18-29	45.7	42.9-50.5	408	40.8	35.9-47.9	109	-4.9
30+	38.9	36.3-40.3	1,248	36.4	35.1-39.1	822	-2.5
Access to and decisions on credit	3.5	2.6-3.9	93	5.5	4.5-6.2	133	2
Age category							
18-29	3.5	2.1-4.9	23	7.8	4.4-10.9	20	4.3
30+	3.5	2.4 -3.8	70	5.2	4.2-6.0	113	1.7
Control over income	56.9	54.3-57.9	1,625	41.6	40.3-44.2	1,046	-15.3
Age category							
18-29	61.9	58.4-65.9	407	51.8	46.9-59.2	138	-10.1
30+	55.4	52.3-56.4	1,218	40.5	38.9-43.0	908	-14.9
Group membership	22.6	20.7-23.7	643	12.5	11.2-13.8	310	-10.1
Age category							
18-29	25.5	22.7-29.5	171	16.7	11.6-20.6	42	-8.8
30+	21.7	19.4-22.7	472	11.9	10.7-13.4	268	-9.8
Workload	35.4	33.1-36.6	1,010	33.5	32.4-36.2	850	-1.9
Age category							
18-29	38.0	34.1-41.5	248	48.6	44.6-56.8	132	10.6
30+	34.7	32.0-35.9	762	31.7	30.4-34.3	718	-3
Autonomy in production	39.7	37.9-41.5	1,151	29.8	28.4-32.1	749	
Age category							
18-29	44.5	41.8-49.5	299	42.1	37.0-49.1	112	-2.4
30+	38.2	36.0-40.0	852	28.3	26.8-30.6	637	-9.9
Purchase, sale or transfer of assets	35.6	33.3-36.8	1,015	35.2	34.0-37.8	889	-0.4
Age category							
18-29	37.2	33.4-40.8	243	33.1	28.4-40.0	89	-4.1
30+	35.2	32.5-36.4	772	35.5	34.1-38.1	800	0.3
Speaking in public	40.4	38.6-42.2	1,169	27.9	27.0-30.6	714	-12.5
Age category							
18-29	42.1	38.8-46.4	279	36.2	31.4-43.2	97	-5.9
30+	39.9	37.7-41.7	890	26.9	25.9-29.7	617	-13
Leisure	25.2	22.6-25.7	701	11.9	10.7-13.3	298	-13.3
Age category							
18-29	30.3	26.3-33.2	195	21.3	17.2-27.4	58	-9
30+	23.6	20.8-24.3	506	10.8	9.5-12.1	240	-12.8

Note: Estimates are based on primary adult decision-makers who are de jure household members.
Source: Feed the Future Ethiopia ZOI Survey 2013 and 2018

Table 7.2c compares the 5DE scores for female and male primary adult decision-makers between the phase one baseline and end-line ZOI Surveys. The 5DE shows that 29 percent of women are empowered in the end-line. The 71 percent that are not yet empowered have acquired adequacy in 63 percent of the indicators. Thus, the women's empowerment index (5DE) is 0.738. The 5DE for men indicates that 61 percent of men are empowered and the adequacy score for the men that are not empowered is 67 percent. The 5DE scores in the end-line are higher than those in the baseline for both men and the women. Based on the five domains of empowerment, the proportion achieving empowerment is lower and the level of

disempowerment is higher among women compared to men at both the baseline and end-line. Furthermore, the decrease in the disempowerment index during the baseline-end-line period is more than twice higher for men than for women while growth in proportion of men achieving empowerment was almost 50 percent higher than women.

Table 7.2c. Comparison of WEAI, 5DE and GPI scores, and average empowerment gap in the PI-ZOI, Feed the Future phase one baseline and end-line ZOI Surveys

Indicator	Baseline (2013)			End-line (2018)			Diff.	p-value[a]	Sig.[b]
	Est.	95% CI	n	Est.	95% CI	n			
Women[c]									
WEAI score	0.70	0.69-0.72	3265	0.75	0.75-0.76	3,047	0.05	0.000	***
Age category									
18-29	0.71	0.68-0.71	1194	0.72	0.72-0.73	612	0.02	0.000	***
30+	0.69	0.69-0.72	2071	0.76	0.76-0.77	2,435	0.07	0.000	***
5DE score	0.68			0.74			0.06		
Women achieving empowerment (%)	22.3		718	29.2		884	6.9	0.000	***
Weighted indicators in which disempowered individuals have adequate achievements (%)[d]	59.0		3,466	63.0		3,047	-1.0	0.000	***
Number of women			3466			3252			
GPI score	0.87		4436	0.90		3,726	0.03		
Women achieving gender parity (%)	44.8		1437	48.7		1,463	3.9	0.099	*
Age category									
18-29	43.4		513	42.3		257	-1.1	0.77	n/s
30+	45.9		932	50.8		1,218	4.9	0.066	*
Average empowerment gap	23.5			19.3				0	***
Number of dual-adult households[e]			2,218			1,863			
Men[f]									
5DE score	0.80			0.87			0.07		
Men achieving empowerment (%)	42.2		912	61.0		1,116	18.8		
Weighted indicators in which disempowered individuals have adequate achievements (%)[d]	65.0		2,998	67.0		2,542	-8.0		
Number of men			2,218			1,863			

Source: Feed the Future Feedback ZOI Survey, Ethiopia 2013; Feed the Future End-line ZOI Survey 2018, Ethiopia.

[a] Significance tests were performed to determine whether a difference exists between the baseline and end-line estimates. An F-test of statistical significance in differences in proportions between the baseline and 2018 estimates was conducted.

[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] Also referred to as the average adequacy score.

[e] Number of households with both a male primary adult decision-maker and a female primary adult decision-maker.

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

Notes:

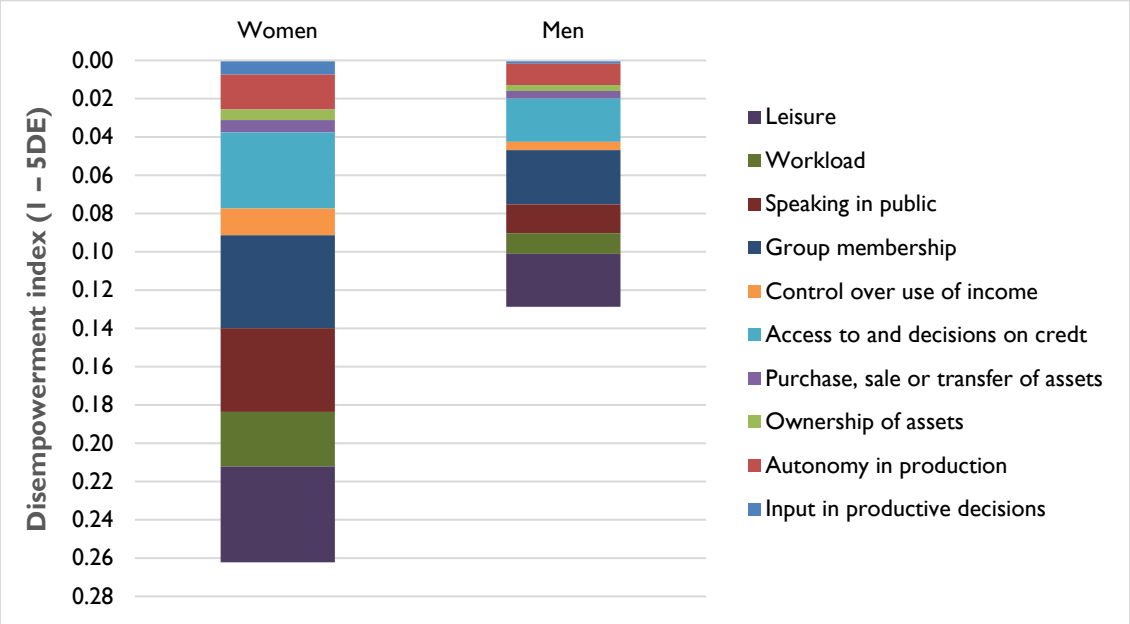
Estimates are sample-weighted; numbers of observations are unweighted.

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

The GPI shows that 49 percent of the women have gender parity with the primary males in their households at the end-line. This has shown a 4-percentage points improvement from the baseline value. The 51 percent women that did not achieve gender parity have an empowerment gap of 19.3 percent with the males in their households. This gap is 4.2 percentage points lower in the end-line relative to the 23.5 percent at the baseline. Thus, the overall GPI is 0.901 in the end-line, with a 0.031 percentage points (3.6 percent) improvement over the baseline. The WEAI, which is a weighted average of the 5DE sub-index value of 0.738 and the GPI sub-index value of 0.901, is 0.754, which is an improvement of 0.052 (7 percent) in the end-line relative to its baseline value of 0.702.

Figure 7.1 shows the contribution of each empowerment indicator to the disempowerment of women and men. The indicators that contribute most to women's disempowerment are lack of leisure, discomfort with speaking in public, lack of participation in groups, and lack of access to and decisions on credit. The indicators that contribute to men's disempowerment are roughly similar with those that contribute to women's disempowerment. Lack of leisure, lack of participation in groups, and lack of access to and decisions on credit are the three most important contributors to men's disempowerment. Heavy work time requirements and discomfort speaking in public also contribute to disempowerment, but less so for men than for women.

Figure 7.1: Contribution of each indicator to the disempowerment of women and men in the P1-ZOI end-line Survey

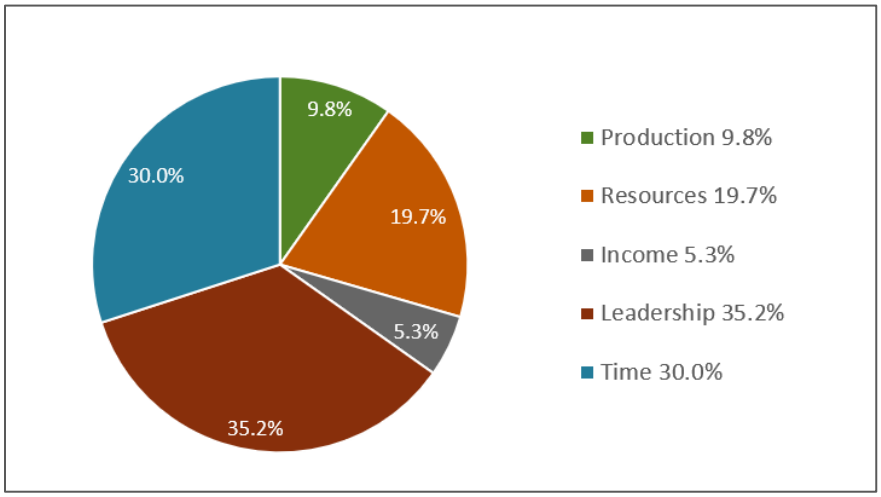


Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

Figure 7.2a shows the contribution of each of the five domains to the disempowerment of women. **Figure 7.2b** shows the same for men. According to Figure 7.2a, the domains that contribute most to women's disempowerment are time, leadership and resources, accounting

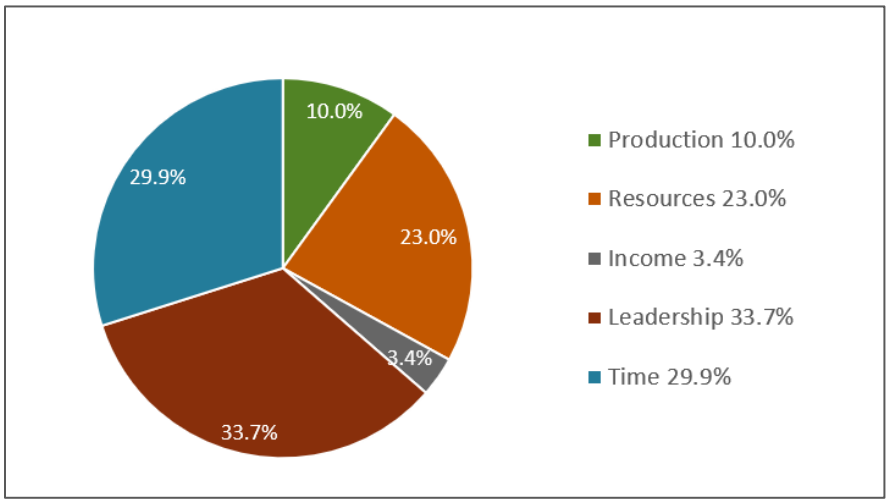
for 35, 30, and 20 percent, respectively, of disempowerment of women. The composition of men disempowerment is similar to that of the women with time, leadership and resource domains accounting for roughly similar percentages to women's disempowerment.

Figure 7.2a: Contribution of each of the five domains to the disempowerment of women in the P1-ZOI end-line Survey



Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

Figure 7.2b: Contribution of each of the five domains to the disempowerment of men in the P1-ZOI end-line Survey



Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

7.2 Production

Adequacy in *Production* is measured by input into decisions about agricultural activities in which an individual participates and autonomy in agricultural production. 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 and respondent has a relative autonomy index (RAI) greater than 1 in at least one of the four areas of agricultural decision-making.

Table 7.3 presents the percentages of female and male primary adult decision-makers who are involved in agricultural activities (i.e., food crop farming, cash crop farming, livestock raising or fishing), nonfarm economic activities, and wage or salaried employment. This table also presents the percentages of female and male primary adult decision-makers who have input into the decisions made about specific activities.

During the end-line, around 84 percent of women participate in food crop farming, 73 percent in livestock raising and 59 percent in cash crop farming. The proportion of men that participated in the respective activities is relatively higher at around 94 percent, 78 percent and 67 percent. Although participation in nonfarm economic activities and wage employment is generally low, the percentage of men participating in nonfarm economic activities is much higher (almost double) compared to the women. Fishing is a very rare activity for both men and female decision-makers.

The percentage of women making decisions in each activity is generally high (88 percent or higher for all activities except fishing and nonfarm economic activities) but lower than the percentage of men that have input into decision-making. The gap between the percentage of men and women that participate in making decisions is the highest for nonfarm economic activities.

Table 7.3. Participation in economic activities and input into activity decision-making among female and male primary adult decision-makers in the P1-ZOI end-line Survey

Activity	Participates in activity				Has input[1] into decisions about activity			
	Female		Male		Female		Male	
	Percent	n[2]	Percent	n[3]	Percent	n[4]	Percent	n[4]
All primary adult decision-makers	**93.9**	**3,252**	**97.6**	**2,527**	**93.6**	**3,039**	**97.6**	**2,460**
Type of agricultural activity								
Food crop farming	83.9	3,252	94.4	2,527	88.9	2,691	96.3	2,367
Cash crop farming	58.9	3,252	67.3	2,527	89.7	1,863	96.3	1,659
Livestock raising	73.0	3,252	77.6	2,527	89.9	2,341	96.0	1,942
Fishing or fishpond culture	0.8	3,252	1.2	2,527	64.4	21	76.9	29
Nonfarm economic activities	11.1	3,252	13.9	2,527	87.9	351	92.1	350
Wage or salaried employment	5.8	3,252	12.1	2,527	79.2	185	95	300

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

[1] Having input means that the individual reported having input into most or all decisions regarding the activity.

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

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

[4] Estimates exclude individuals who do not participate in an activity or report that no decision was made.

7.3 Resources

Adequacy in *Resources* is measured by three indicators: (1) ownership of assets, (2) Purchase, sale or transfer of assets, and (3) access to and decisions related to credit. Respondents are considered adequate in asset ownership if they own alone or jointly at least two small assets or one large asset. Respondents are considered adequate in the purchase, sale or transfer of assets if they decide to sell, give away or rent at least one asset, but not only chickens and non-mechanized farming equipment. Respondents are considered adequate to 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 7.4a** presents the findings for ownership of productive resources.

Agricultural land, large livestock and non-mechanized farm equipment are among the most commonly owned productive assets in the end-line with 91.5 percent, 77.4 percent and 71.5 percent of the households owning the assets, respectively. A relatively lower proportion of the households own means of transportation (1.4 percent), mechanized farm equipment (0.8 percent), and fishpond or fishing equipment (0.3 percent). A higher percentage of men own most assets compared to women. This gap is especially very large for cell phones. Around 39 percent of the men own cellphones while only 17.7 percent of women own cellphones. On the other hand, a higher percentage of women own poultry (chickens, ducks, turkeys and pigeons) and small consumer durables. Ownership of land is critical for livelihood in these rural communities. Surprisingly, the proportion of men that own agricultural land is only slightly (4.2 percentage points) higher than women while the proportion of women that own non-agricultural land is higher by about the same proportion.

Table 7.4a. Household and female and male primary adult decision-maker ownership of productive resources in the P1-ZOI end-line Survey

Type of resource	Someone in the household owns item		Female owns solely or jointly		Male owns solely or jointly	
	Percent	n[1]	Percent	n[2]	Percent	n[3]
Agricultural land	91.5	5,779	79.1	3,252	83.3	2,527
Large livestock	77.4	5,779	69.5	3,252	76.1	2,527
Small livestock	48.0	5,779	42.5	3,252	46.6	2,527
Chickens, ducks, turkeys and pigeons	50.4	5,779	41.3	3,252	35.3	2,527
Fish pond or fishing equipment	0.3	5,779	0.2	3,252	0.3	2,527
Non-mechanized farm equipment	71.5	5,779	45.9	3,252	71.1	2,527
Mechanized farm equipment	0.8	5,779	0.5	3,252	1.1	2,527
Nonfarm business equipment	3.1	5,779	2.3	3,252	2.7	2,527
House or other structures	36.8	5,779	33.9	3,252	33.7	2,527
Large consumer durables	3.6	5,779	3.3	3,252	3.9	2,527
Small consumer durables	62.1	5,779	54.4	3,252	44.4	2,527
Cell phone	40.4	5,779	17.7	3,252	38.5	2,527
Non-agricultural land	2.9	5,779	2.6	3,252	3.0	2,527
Means of transportation	1.4	5,779	0.9	3,252	1.5	2,527

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

[1] Estimates exclude households that have no primary adult decision-maker and that have missing or incomplete indicator data. Respondents who indicated "not applicable" are also excluded.

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

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

Table 7.4b presents the percentage of women who can make a decision to purchase or to sell, give away, or rent owned items. Women are considered as having the ability to make a decision if they can solely make a decision or if they can make these decisions with others with any degree of input. The percentage of women and men who have input in decisions to purchase, sell, give or rent items is comparable for most items during the end-line. A relatively higher percentage of women have input in decisions related to poultry, nonfarm business equipment and small consumer durables. On the other hand, more men make decisions on farm equipment, cellphones and means of transportation compared to women.

Table 7.4b. Household and female and male primary adult decision-maker control over productive resources in the P1-ZOI end-line Survey

Type of resource	Someone in the household owns item		Female can decide to purchase/sell/give/rent items		Male can decide to purchase/sell/give/rent items	
	Percent	n[1]	Percent	n[1]	Percent	n[1]
Agricultural land	91.5	5,779	90.9	2,954	92.7	2,319
Large livestock	77.4	5,779	92.5	2,488	94.1	2,057
Small livestock	48.0	5,779	90.7	1,558	92.3	1,312
Chickens, ducks, turkeys and pigeons	50.4	5,779	84.7	1,622	73.8	1,263
Fish pond or fishing equipment	0.3	5,779	80.5	9	90.6	9
Non-mechanized farm equipment	71.5	5,779	69.9	2,173	94.3	1,900
Mechanized farm equipment	0.8	5,779	71.8	24	89.3	34
Nonfarm business equipment	3.1	5,779	77.7	102	67.3	99
House or other structures	36.8	5,779	94.5	1,152	94.3	881
Large consumer durables	3.6	5,779	93.2	132	94.2	122
Small consumer durables	62.1	5,779	90.1	1,980	71.5	1,602
Cell phone	40.4	5,779	48.9	1,334	81.3	1,231
Non-agricultural land	2.9	5,779	90.5	89	87.1	88
Means of transportation	1.4	5,779	63.7	47	83.1	48

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

[1] Estimates exclude households that have no primary adult decision-maker and that have missing or incomplete indicator data. Respondents who indicated "not applicable" are also excluded.

Tables 7.5a and **7.5b** show the third indicator of the *Resources* domain—access to and decision-making on credit. Table 7.5a presents the percentage of female primary adult decision-makers who report that a member of her household received any loan in the past 12 months—overall and disaggregated by source. The percentages of households that received an in-kind loan (e.g., food items or raw materials) or a cash loan are also presented. The in-kind and cash loan categories are not mutually exclusive; a household could have received both types of loans. For female primary adult decision-makers living in households that received a loan, the table also presents the percentages who report having contributed to the decision to take the loan and the subsequent decisions on how to use the loan. Table 7.5b presents the same information for male primary adult decision-makers.

About 25 percent of women reported that their household received a loan from non-governmental organization, informal or formal lenders, friends or relatives, or group-based microfinances during the end-line. The main sources of credit are friends or relatives, and group-based microfinance. The majority (92 percent) of women contribute to credit decisions. Particularly, a slightly higher proportion contributed on the decision how to use the loan. Table 7.5b indicates that about 29 percent of men reported that their households have taken credit.

For both women and men, the major sources of credit are friends or relatives, and group-based microfinance. About the same proportion of men participated in the decision regarding loans as that of women.

Table 7.5a. Access to credit among female primary adult decision-makers in the P-ZOI end-line Survey

		Credit source (percent)[1]				
	Any source (percent)	Non-governmental organization	Informal lender	Formal lender	Friends or relatives	Group-based microfinance
Household received a loan						
Any loan	25.4	1.9	2.5	1.3	8.4	12.8
In-kind loan	2.1	1.3	0.4	0.2	0.4	0.5
Cash loan	23.7	0.7	2.3	1.2	8.1	12.7
n[2]	3,239	3,239	3,239	3,239	3,239	3,239
Primary adult decision-maker contributed to credit decision						
Any decision	92.0	73.9	88.1	94.8	88.4	95.1
On whether to borrow	85.9	59.9	84.6	92.6	82.1	90.3
On how to use loan	91.5	73.9	88.1	94.8	88.4	95.1
n[3]	755	64	82	41	276	380

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

[1] Percentages sum to more than 100 because loans may have been received from more than one source.

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

[3] Estimates exclude households that do not have a female primary adult decision-maker, that did not receive a loan, or that have missing or incomplete indicator data.

Table 7.5b. Access to credit among male primary adult decision-makers in the P1-ZOI end-line Survey

		Credit source (percent)[1]				
	Any source (percent)	Non-governmental organization	Informal lender	Formal lender	Friends or relatives	Group-based microfinance
Household received a loan						
Any loan	29.2	2.8	2.9	1.4	9.2	14.3
In-kind loan	2.4	1.3	2.8	1.3	8.9	14.1
Cash loan	27.1	1.6	0.2	0.1	0.4	0.4
n[2]	2,523	2,523	2,523	2,523	2,523	2,523
Primary adult decision-maker contributed to credit decision						
Any decision	91.7	74.3	96.8	84.6	93.1	93.9
On whether to borrow	87.1	63.2	95.3	84.6	91.3	87.6
On how to use loan	91.2	74.3	95.8	84.6	92.6	93.2
n[3]	674	70	73	31	228	336

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

[1] Percentages sum to more than 100 because loans may have been received from more than one source.

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

[3] Estimates exclude households that do not have a male primary adult decision-maker, that did not receive a loan, or that have missing or incomplete indicator data.

7.4 Income

Adequacy in *Income* is measured by input into decisions related to income. Respondents are considered adequate if they have substantial input into most or all decisions or feel they can make a decision for at least one economic activity. **Table 7.6** shows the percentages of female and male primary adult decision-makers who have input into the decisions made regarding the use of income derived from an economic activity. Ninety-three percent of the women who participated in one or more of the economic activities had input into decision-making on use of income from the activity. While the percentage of women making income decisions is always lower relative to the percentage of men, it is very close in most activities except for fishing and nonfarm economic activities.

Table 7.6. Input into decision-making on use of income among male and female primary adult decision-makers in the P1-ZOI end-line Survey

	Has input[1] into income from activity			
	Female		Male	
Activity	Percent	n[2]	Percent	n[3]
Total	**93.2**	**3,201**	**97.5**	**2,515**
Food crop farming	89.3	2,687	95.8	2,366
Cash crop farming	90.1	1,866	96.3	1,657
Livestock raising	90.3	2,330	96.6	1,932
Fishing or fishpond culture	73.9	20	83.0	28
Nonfarm economic activities	80.0	349	93.8	350
Wage or salaried employment	88.1	184	91.9	297

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

[1] Having input means that the individual reported having input into most or all decisions regarding the use of income generated from the activity.

[2] Estimates exclude households that do not have a female primary adult decision-maker or that have missing or incomplete data. Estimates also exclude respondents who do not participate in the activity or who report that no decision was made regarding the activity.

[3] Estimates exclude households that do not have a male primary adult decision-maker or that have missing or incomplete data. Estimates also exclude respondents who do not participate in the activity or who report that no decision was made regarding the activity.

7.5 Leadership

Adequacy in *Leadership* is measured through an individual's active involvement with community organizations and speaking in public. The first indicator of the Leadership domain is an individual's participation in a community organization. Respondents are considered adequate in this indicator if they are active members of at least one community organization. The second indicator is an individual's ease speaking in public and the respondent is considered adequate if she/he feels comfortable speaking in at least one public setting.

Table 7.7a shows the percentages of female and male primary adult decision-makers who are active members of organizations in their community. About 44 percent of women and 55 percent of men are involved in some type of community group. The highest percentage of women and

men participate in religious groups at 33.5 and 40 percent, respectively. The percentage of men participating in all groups is higher than women; particularly, the difference is highest in membership of local government.

Table 7.7a. Group membership among female and male primary adult decision-makers in the P1-ZOI end-line Survey

	Is an active group member			
	Female		Male	
Type of group	Percent[1]	n[2]	Percent[1]	n[3]
All primary adult decision-makers	43.9	3,252	55.2	2,527
Agricultural producers' group	0.7	3,252	2.3	2,527
Water users' group	9.6	3,252	13.7	2,527
Forest users' group	0.9	3,252	3.3	2,527
Credit or microfinance group	3.7	3,252	5.3	2,527
Mutual help or insurance group	11.0	3,252	16.3	2,527
Trade and business association	0.2	3,252	0.5	2,527
Civic or charitable group	0.4	3,252	1.4	2,527
Local government	6.1	3,252	14.7	2,527
Religious group	33.5	3,252	40.0	2,527
Other women's group	7.6	3,252	6.0	2,527
Other	0.0	3,252	0.2	2,527

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia 2019

[1] The denominator for this percentage includes 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. Individuals who report that none of the groups exist or who are unaware of any groups are counted as having inadequate achievement of this empowerment indicator.

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

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

The second indicator of the domain is an individual's ease speaking in public, which is measured by three questions related to the level of difficulty an individual faces when voicing her/his opinion regarding community decisions. **Table 7.7b** shows that the proportion of males who feel comfortable speaking in public about community related issues (79 percent) is 32 percentage points higher than females (47 percent). The difference between the percentage of females and males with ease of public speaking in any one of the three specific issues is about the same as the difference above.

Table 7.7b. Comfort with speaking in public among female and male primary adult decision-makers in the P1-ZOI end-line Survey

Topics for public discussion	Comfortable speaking in public about selected topics			
	Female		Male	
	percent	n[1]	percent	n[2]
All primary adult decision-makers	47.0	3,252	78.6	2,527
Topics				
To help decide on infrastructure to be built in the community	43.4	3,252	75.7	2,527
To ensure proper payment of wages for public works or other similar programs	41.8	3,252	71.9	2,527
To protest the misbehavior of authorities or elected officials	42.0	3,252	71.8	2,527

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia 2019

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

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

7.6 Time

Adequacy in the last domain, *Time*, assesses the workloads of female and male primary adult decision-makers, as directly measured using a time allocation log. Respondents are considered adequate if they spend 10.5 hours or less performing work activities from 5:00 a.m. in the morning to 9:00 p.m. in the evening. **Table 7.8a** shows the percentages of female primary adult decision-makers that performed the listed activities the day prior to the survey and the average number of hours that they spent performing each activity. **Table 7.8b** shows the same for male primary adult decision-makers. 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. Both primary and secondary activities are presented. Individuals were allowed to report up to two activities per time use increment (30 minutes). If the individual reported performing two activities, one was designated as the primary activity, and the other as a secondary activity. Some individuals may not have reported a secondary activity for each 30-minute period.

Cooking and domestic cleaning duties take a lion share of women's time on average. Women also contribute a considerable share of their time to farm and livestock-related activities. In contrast, the majority of men's time is spent on farming and livestock-related activities followed by time with family.

Table 7.8a. Time allocation among female primary adult decision-makers in the P1-ZOI end-line Survey

Activity	Primary activity		Secondary activity[1]	
	Percent of women	Mean hours devoted	Percent of women	Mean hours devoted
Sleeping and resting	99.9	3.66	12.1	2.17
Eating and drinking	98.6	2.33	19.7	1.31
Personal care	59.2	0.58	8.0	0.35
School and homework	1.3	0.02	0.4	0.01
Work as employed	1.2	0.06	0.3	0.06
Own business work	2.3	0.11	0.5	0.08
Farming/livestock/fishing	42.8	1.79	5.5	1.05
Shopping/getting services	6.7	0.23	2.0	0.13
Weaving, sewing, textile care	0.5	0.01	1.2	0.01
Cooking	77.7	2.05	16.1	1.08
Domestic work (cleaning)	75.9	3.20	19.5	1.68
Gathering fuelwood/fetching water	24.7	0.34	3.8	0.19
Care for children/adults/elderly	15.3	0.39	10.2	0.39
Travel and commuting	8.7	0.18	1.6	0.12
Watching TV/listening to radio/reading	1.2	0.02	0.6	0.01
Sitting with family	42.1	1.00	11.4	0.59
Hobbies/sports/exercising/reading	3.0	0.06	0.6	0.04
Religious activities	18.0	0.43	3.1	0.26
Social/community activities	16.3	0.44	2.4	0.25
Selling	2.7	0.08	0.4	0.00
Other	0.4	0.01	0.0	0.05
n	3,252	3,252	3,252	3,252

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

[1] Respondents were allowed to report up to two activities per time use increment (30 minutes) from 5:00 a.m. to 9:00 p.m. prior to the survey. If two activities were reported, one was designated as the primary activity, and the other as a secondary activity. Some women may not have reported a secondary activity for each 30-minute period.

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

Table 7.8b. Time allocation among male primary adult decision-makers in the P1-ZOI end-line Survey

Activity	Primary activity		Secondary activity[1]	
	Percent of men	Mean hours devoted	Percent of men	Mean hours devoted
Sleeping and resting	99.5	3.74	13.8	3.14
Eating and drinking	98.5	2.49	19.2	2.15
Personal care	62.3	0.73	8.4	0.62
School and homework	0.9	0.02	0.5	0.02
Work as employed	3.6	0.23	0.8	0.19
Own business work	3.2	0.16	0.4	0.13
Farming/livestock/fishing	81.3	5.38	9.2	4.64
Shopping/getting services	5.0	0.22	2.1	0.18
Weaving, sewing, textile care	0.7	0.02	1.5	0.01
Cooking	5.0	0.10	1.1	0.07
Domestic work (cleaning)	8.3	0.22	1.7	0.17
Gathering fuelwood/fetching water	5.8	0.09	0.8	0.07
Care for children/adults/elderly	3.8	0.06	1.5	0.05
Travel and commuting	13.3	0.33	2.0	0.27
Watching TV/listening to radio/reading	3.3	0.06	2.1	0.06
Sitting with family	53.7	1.42	12.8	1.26
Hobbies/sports/exercising/reading	5.2	0.10	1.0	0.08
Religious activities	22.5	0.54	4.7	0.46
Social/community activities	26.7	0.90	3.7	0.79
Selling	0.2	0.15	0.1	0.13
Other	0.7	0.01	0.0	0.01
n	2,527	2,527	2,527	2,527

Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.

[1] Respondents were allowed to report up to two activities per time use increment (30 minutes) from 5:00 a.m. to 9:00 p.m. prior to the survey. If two activities were reported, one was designated as the primary activity, and the other as a secondary activity. Some women may not have reported a secondary activity for each 30-minute period.

Estimates exclude households that do not have a male primary adult decision-maker or that have missing or incomplete data.

8. Summary and Conclusions

This report provides information about the ZOI indicators during the 2013-2018 (baseline-end-line) period. The assessment is designed for use as a monitoring tool, and as such provides point estimates of the indicators with an acceptable level of statistical precision. However, Feed the Future ZOI sample calculations are not designed to support conclusions of causality or program attribution, nor is the end-line assessment designed to measure change from the baseline.

The Ethiopia ZOI end-line survey was conducted by International Food Policy Research Institute (IFPRI) in conjunction with its data collection partner, BST Consulting PLC. Fieldwork for the ZOI Survey took place between September and October 2018.

Twelve Feed the Future indicators were included in this assessment: (1) Daily per capita expenditures (as a proxy for income) in USG-assisted areas; (2) Prevalence of poverty; (3) Depth of poverty; (4) Prevalence of households with moderate or severe hunger; (5) Women's dietary diversity; (6) Prevalence of children 6-23 months receiving a minimum acceptable diet (MAD); (7) Prevalence of exclusive breastfeeding among children under 6 months of age; (8) Prevalence of underweight women; (9) Prevalence of stunted children under 5 years of age; (10) Prevalence of wasted children under 5 years of age; (11) Prevalence of underweight children under 5 years of age; and (12) Women's Empowerment in Agricultural Index (WEAI).

Household Economic Status

The daily per capita expenditures in the Feed the Future ZOI was $2.19 (in 2010 USD) in 2018 and 32.3 percent of the population fell below the $1.25/day (2005 PPP) poverty line. The depth of poverty is estimated at 12.2 percent. Relative to the baseline, daily per capita expenditure is higher, and the prevalence and depth of poverty is lower in the end-line.

Hunger and Dietary Intake

Prevalence of households with moderate or severe hunger is 3.3 percent and this is 30 percent lower than the proportion in the baseline (4.9 percent), though this rather very low rate may be due to the non-validity of the measure in Ethiopia. Dietary diversity is extremely low. Women of reproductive age consume from an average 2.3 food groups in a day, and only 4.6 percent of women achieve the minimum dietary diversity or consume from at least 5 food groups. Only 8.4 percent of children 6-23 months receive a MAD. Prevalence of exclusive breastfeeding among children under 6 months of age is higher at about 74 percent. The proportion of children 6-23 months that receive a MAD, and the mean and minimum dietary diversity of women of reproductive age in the end-line were statistically significantly higher relative to the baseline.

Nutritional Status of Women and Children

Nearly 22 percent of women of reproductive age are underweight. Prevalence of stunted children under 5 years of age is about 39 percent. The prevalence of wasting is about 10 percent while 22.5 percent of children under 5 years of age are underweight. The proportion of underweight women of reproductive age, and the proportion of underweight, stunted, and wasted children under 5 years of age statistically significantly declined during the baseline-end-line period.

Women's Empowerment in Agriculture

Women's empowerment is measured through the full Women Empowerment in Agricultural Index (WEAI). In 2018, the WEAI for the ZOI in Ethiopia is estimated as 0.75. Small improvements across all domains are recorded. Access to and input into decisions on credit is a major constraint to women's empowerment. Lack of leisure time, group membership and speaking in public are also among important contributors to women's disempowerment.

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Appendix 1. Supplementary Data and Figures

Table A1.1. ZOI Survey 2018 Feed the Future indicator estimates

Unweighted sample sizes, point estimates, standard deviations, confidence intervals, design effects and nonresponse rates for the Feed the Future indicators for the ZOI.

Indicator	Estimate	SE	95% CI		DEFF	Nonresponse rate (%)[1]	Unweighted number	Weighted number
			Lower	Upper				
Daily per capita consumption expenditures 2010 USD								
All households	2.19	0.0422	2.10	2.27	2.5	3.0	3,876	3,876
Male and female	2.21	0.048	2.12	2.31	2.3	3.6	3,089	3,091
Female adult(s) only	1.95	0.081	1.79	2.11	1.3	0.0	665	668
Male adult(s) only	2.05	0.259	1.53	2.56	1.0	0.9	115	110
Prevalence of Poverty: Percent of people living on less than $1.25/day (2005)								
All households	32.3	0.003	30.8	33.8	3.8	3.0	3,876	3,876
Male and female	31.3	0.008	29.6	32.9	3.6	3.6	3,089	3,091
Female adult(s) only	40.8	0.020	37.1	44.6	1.5	0.0	665	668
Male adult(s) only	36.3	0.045	27.3	45.1	1.0	0.9	115	110
Depth of Poverty: Mean percent shortfall relative to the $1.25/day poverty								
All households	12.2	0.003	11.4	12.8	1.5	3.0	3,876	3,876
Male and female	11.7	0.003	10.9	12.5	1.7	3.6	3,089	3,091
Female adult(s) only	15.8	0.009	13.9	17.6	1.0	0.0	665	668
Male adult(s) only	12.5	0.020	8.5	16.4	1.0	0.9	115	110
Prevalence of moderate and severe hunger								
All households	3.3	0.003	2.6	4.2	1.9	0.2	3,882	3,882
Male and female	2.5	0.003	1.9	3.3	1.7	0.3	3,098	3,100
Female adult(s) only	6.8	0.009	5.0	9.3	1.2	0.0	661	665
Male adult(s) only	6.6	0.022	3.1	13.4	1.1	0.0	116	110
Women dietary diversity: Mean number of food groups consumed by women								
All women ages 15-49	2.3	0.018	2.2	2.4	5.4	1.4	3,956	3,971
Prevalence of underweight women of reproductive age								
All non-pregnant women	21.9	0.007	19.9	24.0	2.3	0.0	3,604	3,616
Prevalence of exclusive breastfeeding among children under 6 months of age								
All children	74.5	0.042	63.4	83.1	1.4	0.0	111	111
Male children	73.9	0.719	58.9	84.8	1.2	0.0	57	56
Female children	75.1	0.060	62.0	84.8	1.0	0.0	54	55
Prevalence of children 6-23 months receiving a minimum acceptable diet (%)								
All children	8.4	0.011	6.4	11.0	1.1	1.4	639	633
Male children	7.5	0.015	5.0	11.1	1.1	1.2	324	323
Female children	9.3	0.016	6.4	13.1	1.0	1.6	315	310
Prevalence of stunted children under 5								

All children	38.9	0.011	36.1	41.8	1.7	11.1	1,963	1,954
Male children	38.8	0.015	34.9	42.8	1.7	11.8	976	972
Female children	39.0	0.015	35.8	42.3	1.1	10.5	987	981
Prevalence of wasted children under 5								
All children	9.7	0.006	7.8	12.0	2.4	11.7	1,916	1,910
Male children	11.0	0.010	8.7	13.9	1.7	12.5	950	951
Female children	8.4	0.008	6.3	11.2	1.9	11.0	966	959
Prevalence of underweight children under 5 years of age								
All children	22.5	0.009	20.5	24.6	1.3	2.5	2,153	2,138
Male children	23.9	0.013	21.2	26.7	1.1	3.2	1,071	1,066
Female children	21.1	0.012	18.7	23.7	1.1	1.9	1,082	1,073
Women's Empowerment in Agriculture Index (score)								
All women	0.75	0.0007	0.75	0.76	1.9	0.0	3,252	3252
Women ages 18-29	0.72	0.003	0.72	0.73	1.3	0.0	647	643
Women ages 30 and	0.76	0.002	0.76	0.77	1.7	0.0	2,605	2608

Source: Source: Feed the Future End-line ZOI Survey 2018, Ethiopia.
Note. The number of child-headed households in the sample is too small to obtain any valid estimate. SE = standard error; CI = confidence interval; DEFF = design effect.
[1] The nonresponse rates are calculated as the fraction of the expected number of respondents for each indicator and respondent type.

Table A1.2. Women's Empowerment in Agriculture Index results for indicators that compose the 5 domains of empowerment, using uncensored headcount ratios

Domain	Indicator	Baseline		End-line		p-value[2]
		Percent	n[1]	Percent	n[1]	
Production	Input in productive decisions	88.3	3,401	91.7	3,167	0.001
	Autonomy in production	74.7	3,416	80.6	3,209	0.012
	Ownership of assets	80.0	3,464	90.8	3,252	0.000
Resources	Purchase, sale or transfer of assets	74.5	3,464	88.7	3,252	0.000
	Access to and input into decisions on credit	15.0	3,431	23.4	3,239	0.000
Income	Control over use of income	89.0	3,391	92.1	3,201	0.001
Leadership	Group membership	44.8	3,463	44.7	3,191	0.985
	Speaking in public	48.0	3,463	47.0	3,252	0.771
Time	Workload	52.3	3,445	67.0	3,252	0.000
	Leisure	49.7	3,461	40.7	3,252	0.003

Source: Feed the Future Feedback ZOI Survey, Ethiopia 2013; Feed the Future End-line ZOI Survey 2018, Ethiopia.
[1] Estimates exclude households that do not have a female primary adult decision-maker or that have missing or incomplete indicator data.
[2] An F-test of statistical significance in differences in proportions between the baseline and 2018 estimates was conducted.

Appendix 2. Methodology

A2.1 Sampling and Weighting[25]

The Feed the Future Ethiopia End-line ZOI Survey 2018 is the third round of the Feed the Future surveys designed and implemented starting at the baseline in 2013. It is a panel survey covering the same households first surveyed at baseline (2013).

Recall that the original objective was to conduct an impact evaluation of Feed the Future investments. It was agreed at the time that, given the design of the program and limits to the budget for evaluation studies, the most feasible evaluation strategy is matching based on samples of households within and outside of the Feed the Future ZOI. Sample size with sub-samples were determined accordingly using the relevant power calculations using incidence of poverty (poverty headcount) as the primary indicator (see "Sampling at baseline" below).

At end-line, this objective was modified to tracking the difference in the levels of high-level program indicators estimated at baseline and end-line for households in the Feed the Future ZOI only. Households outside of the ZOI were dropped from the sample as a consequence. Accordingly, the level of the indicators (all proportions other than two – daily per capita consumption expenditure and WEAI) were estimated for the baseline and the end-line. Subsequently, the two are compared for each indicator to ascertain whether there is a statistically significant difference between them.

Nevertheless, the change in objective of comparison and sample at end-line implies that the ex-ante power calculations prior to the baseline is no longer applicable.

What are the options?

The most obvious choice is to redo the power calculations ex-post – or compute post-hoc power. However, there appears to be a consensus that this is neither meaningful nor helpful (see Mckenzie and Ozier (2019), Hoenig and Heisey (2001), and references therein. In short, post-hoc power has a one-to-one inverse relationship with corresponding p-values and thus cannot provide any additional information. It may even be misleading.

Another option suggested by Mckenzie and Ozier (2019) is compute the minimum detectable size effect (MDE) using the following formula MDE= $(z_{\alpha/2}+ z_{1-\beta})$*SE, where SE is the standard error of the outcome. For the poverty headcount this comes to 4.5 percentage points. This magnitude is smaller than the envisaged reduction for this indicator at the beginning of the study as well as what is estimated at end-line.

[25] This section is taken from the baseline report except with appropriate updates and changes.

Sampling at baseline (Given that the end-line was not implemented as an impact evaluation, this information is provided for background only.)

The baseline survey was conducted in *woredas* in USAID/Ethiopia's ZOI and also in *woredas* not within the ZOI. By interviewing households at baseline and at end-line both inside and outside of the ZOI and by using a non-experimental impact estimator such as matching, it will be possible to undertake an impact evaluation that determines whether improvements in Feed the Future performance indicators in the ZOI can be attributed to the totality of Feed the Future activities. If these surveys collect information on who participates in the various Feed the Future interventions, it will also be possible to assess both the direct and spillover impacts of Feed the Future. The direct effects are estimated by comparing changes in households that take up Feed the Future interventions with matched households outside the ZOI who, given their characteristics, would have taken up the intervention had it been available. The spillover effects are estimated by comparing changes in households in the ZOI that did not take up Feed the Future interventions with matched households outside the ZOI who, given their characteristics, would not have taken up the intervention even if it had been available. We discuss below whether our sample design can detect other impacts.

Determining sample size

The size of the sample depends on a number of considerations. First, is the purpose of the survey to monitor Feed the Future performance indicators or is it to both monitor Feed the Future performance indicators *and* provide baseline information for impact evaluation? The survey is designed and conducted to achieve the latter. A note of clarification on indicator tracking is appropriate at this point. The RFA requests disaggregating indicators by household gender and age composition. Specifically, the incidence of poverty, pattern of per capita expenditure and prevalence of hunger (i.e., Indicators 1, 2, and 8) are to be disaggregated in this way. Similarly, Indicator 11 will be disaggregated by gender of children while indicator 9 will be disaggregated by gender of children as well as wealth quintiles of households. The sample size required to track indicators and detect impact at these levels of disaggregation would be rather large. Instead, it was agreed that the survey should be designed in such a way that key indicators are, as appropriate, disaggregated by household demographic and wealth characteristics and tracked, though without necessarily aspiring to causal impact evaluation. Obviously, impact at the household level will be assessed in the manner described in the evaluation design section above. The survey was designed and implemented accordingly.

Second, sample size is affected by the desired level of statistical significance (the sample has to be sufficiently large to minimize the chance of detecting an effect that does not exist) and desired statistical power (the sample has to be sufficiently large to minimize the chance of not detecting an effect that does exist). Following standard practice, these were set at a target level of significance of 5 percent (two-tailed) and statistical power of 80 percent.

Sample size also depends on the minimum level of impact the survey is desired to detect in the relevant indicator. For example, should the sample size be large enough to detect that the intervention has reduced poverty by 5 percentage points, by 10 percentage points or by 20 percentage points? These levels of impact, known as minimum detectable effect sizes, are inversely related to sample size. Smaller effect sizes require larger samples; conversely, larger effect sizes require smaller samples. The size of the sample also depends heavily on which Feed the Future indicator is being considered. This is important because required sample sizes are affected by the variability of the indicator. Where the indicator(s) is (are) characterized by high levels of variability, larger sample sizes are needed. It is also affected by what is called the design effect, loosely defined as the extent to which the indicator is correlated across households or individuals within a geographic locality. Higher correlations mean that larger samples are needed.

In addition to all these considerations, the size of the sample depends on precisely what is meant by "Feed the Future impact." Is Feed the Future impact defined in terms of a particular intervention or is it defined in terms of whether the totality of Feed the Future activities in the ZOI leads to changes in performance indicators that can be attributed to Feed the Future?

Finally, we need to take into account the fact that over time some households will move, all members will disperse to other households or the household will choose not to continue to be interviewed. Based on our experiences with other longitudinal household surveys in rural Ethiopia, we assume that 10 percent of the sample will attrite between baseline and end-line.

A central high-level objective of the Feed the Future initiative is poverty reduction. In light the broad outline of Feed the Future targets in Ethiopia, it is reasonable to opt for a sample size large enough to detect a 10-percentage point reduction in the incidence of poverty linked to Feed the Future.[26] The sample size was thus chosen to be large enough to detect this level of impact. This minimum detectable size effect is equivalent to a 22 percent (0.22) standard deviation of poverty reduction in Feed the Future areas over and above that achieved in comparable but non-Feed the Future areas.[27] The sample is divided into two-third treated (Feed the Future ZOI) and one-third control (non-Feed the Future ZOI) woredas. The sample is clustered at the woreda level. The aim is ensuring that by the end-line, there are on average 75 households interviewed per woreda, with these allocated across three Enumeration Area (EAs) each containing 25 households. We calculated the design effect as equaling 8.4.

In summary:

[26] The incidence of poverty measured by the head count ratio calculated using the PPP poverty line of $1.25 USD per day. Note also that in the Feed the Future's guidance notes on target setting, it is stated that in Ethiopia, Feed the Future should reduce the prevalence of poverty from 39.0 to 27.3 percent over a 5-year period.

[27] Calculations using Ethiopian Household Income and Expenditure surveys show that the standard deviation of poverty incidence is around 0.45 and so a 22 percent reduction in this is equivalent to a 10-percentage point reduction in poverty.

- Minimum detectable effect size – 10 percentage point reduction in the incidence of poverty linked to Feed the Future
- Statistical significance – 5 percent
- Statistical power – 80 percent
- Design effect – 8.4
- Enumeration Areas (EA) – 3 per woreda
- Attrition – 10 percent with 75 households per woreda in the end-line survey

Given these features and assumptions, 56 woredas in the Feed the Future ZOI and 28 woredas outside the ZOI are required. In the baseline, 84 households were selected for interview per woreda or 28 households per EA; given an assumed rate of attrition of 10 percent, this will mean that on average, at end-line, there will be 75 households interviewed in each woreda. Therefore, the baseline survey was planned to collect information from 4,704 households in the ZOI (56 woredas x 3 EAs per woreda x 28 households per EA) and 2,352 households outside the ZOI (28 woredas x 3 EAs per woreda x 28 households per EA) giving a total baseline sample of 7,056 households residing in 252 EAs (with each EA located in a corresponding kebele).

Heterogeneity

A number of sources of heterogeneity were considered in the design of the sample. First, the Feed the Future's ZOI spans woredas with diverse agro-ecological potential. In line with this heterogeneity, the non-ZOI woredas were drawn from a set purposively defined to have characteristics similar to woredas found in the ZOI. Moreover, the woreda composition of the sample was made to reflect the distribution of Feed the Future-supported projects by using the percentage of Feed the Future's ZOI (or woredas) each major Feed the Future project covers as a basis of its share in the sample (see Table A2.2 below).

Second, households within a locality differ in terms of dimensions that may be relevant to the performance of Feed the Future-related investments. Two such dimensions can be specifically important – the gender and age of household heads. Accordingly, the household composition of the sample in each EA will be determined by the distribution of household types in the community as defined by the gender and age of household heads (see the discussion in the next paragraph for further detail). This is particularly relevant for the Women Empowerment in Agriculture Index (WEAI).

The EA-level sample is divided into female- and male-headed households, each group further divided into youth-headed and mature-headed households. Thus, the EA sample is divided into a total of 4 age-gender groups. The share of each in the sample is determined by the corresponding shares reported by CSA's Population Census of 2007. Census 2007 data show the distribution of

household heads by age and gender reported in columns 2-3 of Table 1.2. Columns 4-5 of the same table report the composition of the sample households.

Table A2.1: Household composition of the EA sample

	Share in the population of rural household heads – Census 2007 (%)	
	Male	Female
Young (15-34 years of age)	29.6 (8)	5.4 (2)
Mature (35 years of age or older)	48.9 (13)	16.1 (5)

Source: Authors' calculation using CSA data.
Note: The numbers in brackets are implied (columns 2-3) number of sample households in an EA (with the total being a predetermined 28).

Table A2.2: Feed the Future sample woredas, grouped by Feed the Future program

Program	Number of Sample woredas	Total number of woredas in the program	Share in the ZOI (%)*	Share in the Feed the Future Sample (%)*	Number of sample woredas in a program as a fraction of total in the program (%)
AGP	48	111	**74.5**	**85.7**	**43.2**
PRIME	7	30	**20.1**	**12.5**	**23.3**
GRAD	6	16	**10.4**	**11.1**	**37.5**
AGP+GRAD	5				
AGP+ENGINE	12				
Total Number of FTF Sample Woredas	56				
Total Number of Control Sample Woredas	28				
Total Number of Sample Woredas	**84**				

Both treatment and control woredas were randomly selected using proportions derived from population size and project coverage. The regional distribution of the planned sample is summarized in the next table.

Table A2.3: Feed the Future sample households, planned by region

Number of sample households	Amhara	Oromia	SNNP	Somali	Tigray	Total
Initially planned to be interviewed	1848	2436	1680	420	672	7056
Actually interviewed	1848	2414	1677	400	672	7011

Notes: * Shares sum over 100% for two reasons. First, 8 woredas (or about 5%) are covered by more than one Feed the Future-supported program – five of these are in the sample. There are 149 woredas in the Feed the Future's ZOI. Second, AGP and ENGINE woredas overlap, though all AGP woredas were covered by ENGINE at the time of the baseline – there are 12 AGP-ENGINE woredas in the sample. Note also that 11 AGP-LMD woredas are included under the AGP heading in this table.

Selection of the sample

Sample selection included three steps. The first step involved the systematic random selection of woredas from the Feed the Future project categories identified above with probability of selection proportional to size (i.e., combining project coverage and population size). Three EAs were subsequently selected from each woreda randomly with selection probability proportionate to size. In the third step, sample households were chosen from a freshly compiled complete listing of households in each selected using systematic random sampling. The selection probabilities combined the ratio of 28 households to the total number of households in the EA and the proportions of the four household types formed by the age and gender of the household head.

The product of the inverse of the selection probabilities at the three stages form the sample weight of each household for the purpose of estimating the relevant indicators.

A2.2 Poverty Prevalence and Consumption Expenditure Methods

Data Source

The Feed the Future baseline and end-line surveys conducted in 2013 and 2018 are the sources of data for the estimation of consumption expenditures and poverty levels. Data on household food and non-food expenditures as well as local prices were collected by these surveys.

Measuring poverty and comparing poverty across groups

Poverty Indices

Since the work of Sen (1976) on the axiomatic approach to measurement of poverty, several indices of poverty have been developed.

The most widely used poverty indices are the percentage of the poor (headcount index), the aggregate poverty gap (poverty gap index), and the distribution of income among the poor (poverty severity index). The poverty measure itself is a statistical function that translates the comparison of the indicator of household well-being and the chosen poverty line into one aggregate number for the population as a whole or a population subgroup. Many alternative measures exist, but the three measures described below are the ones most commonly used.

Incidence of poverty (headcount index). This is the share of the population whose income or consumption is below the poverty line, that is, the share of the population that cannot afford to buy a basic basket of goods.

Depth of poverty (poverty gap). This provides information regarding how far households are from the poverty line. This measure captures the mean aggregate income or consumption shortfall relative to the poverty line across the whole population. It is obtained by adding up all the shortfalls of the poor (assuming that the non-poor have a shortfall of zero) and dividing the total by the population. In other words, it estimates the total resources needed to bring all the poor to the level of the poverty line (divided by the number of individuals in the population).

Poverty severity (squared poverty gap). This takes into account not only the distance separating the poor from the poverty line (the poverty gap), but also the inequality among the poor, that is, a higher weight is placed on those households further away from the poverty line.

Method of aggregating poverty and hypothesis testing

We used Foster, Greer, and Thorbecke (1984) P_α class of poverty measures. Defining the per-adult (per capita) consumption expenditure of household *i* by Y_i, and ranking Y_i, as:

$$Y_1 \le Y_2 \le .....Y_q \le Z < {}_{q+1} ..... \le Y_N,$$

where *Z* is poverty line, N is the total population, and *q* is the number of poor. Consequently, we can classify an individual poor if the real per adult consumption expenditure is less than to Z (Y<Z) and non-poor if the real per adult consumption expenditure is greater than or equal to Z (Y>=Z). Once we classify an individual into poor and non-poor, we can aggregate poverty at national and sub-national levels using the P_α class of poverty measures given by

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{q}\left(\frac{Z - Y_i)}{Z}\right)^\alpha \;;\; \alpha \ge 0, \text{ for } Y < Z.$$

When α=0, the corresponding poverty index is called the ***headcount index*** (P_0). Hence P_0 corresponds to the fraction of individuals falling below the poverty line. If α=1, the poverty index is called the ***poverty gap index*** (P_1) and it measures the aggregate poverty deficit of the poor relative to the poverty line, where α**=2** it measures the squared proportional shortfalls from the poverty line and is commonly known as an index of the severity of poverty.

Comparing Poverty between Groups

There are two ways of comparing poverty indices across groups or over time. The first way to compare poverty indices between, say, two groups (group 1 and group 2) is to conduct a statistical test or means separation test. If the poverty measures are estimated from unit record data (i.e., on the basis of sample observations), it is possible to test whether the observed differences in their values are statistically significant. The hypothesis test developed by Kakwani (1993) can be used to test whether poverty indices (P_α**)** differ significantly between groups and over time. The standard error of P_α is calculated using the following formula (Ravallion 1992):

$$SE(P_\alpha) = \sqrt{\frac{(P_\alpha - P_\alpha^2)}{n}},$$

where SE (.) is the standard error. Consequently, the standard error (SE) of the difference in poverty index between group 1 and group 2 (SE ($P_{\alpha 1}$ - $P_{\alpha 2}$), having a random sample n1 and n2, respectively, is given by

$$SE(P_{\alpha 1} - P_{\alpha 2}) = \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}},$$

where s1 and s2 are the sample estimator of the variance of the asymptotic distribution of

$P_{\alpha 1}\sqrt{n_1}$ and $P_{\alpha 2}\sqrt{n_2}$,

such that:

$$SE(P_{\alpha 1} - P_{\alpha 2}) = \sqrt{(SE(P_{\alpha 1}))^2 + (SE(P_{\alpha 2}))^2}.$$

The test statistic (t) is given by:

$$t = \frac{(P_{\alpha 1} - P_{\alpha 2})}{SE(P_{\alpha 1} - P_{\alpha 2})}.$$

This is asymptotically normally distributed with zero mean and unit variance. In a large sample, if the calculated value of t (the test statistics) has an absolute value less than 1.96 (2.58), then the difference in the poverty indices between two groups or dates is not statistically significant at the 5 percent (1 percent) level, using a two-tail test.

Data Preparation

Currency Conversions using CPI and PPP

The following steps were involved in converting the 2005 PPP international poverty line of $1.25 to one in Ethiopian Birr at 2013 and 2018 prices. Purchasing power parity conversion factors (PPP) and consumer price indices (CPI) are used for the purpose.

Conversion: To make it comparable with the expenditure data collected in 2013 and 2018 in Ethiopia, the poverty line has to be converted into Ethiopian Birr in 2013 and 2018 prices. These required a number of inputs/steps.

i. PPP Conversion factor – Initial: Converts PPP dollars into Ethiopian Birr in 2005 prices using the PPP conversion Factor for Ethiopia of 2.75;

ii. PPP Conversion factor – Updates (2005-2011 and 2005-2018): The conversion factor is thus extrapolated by adjusting it for local inflation using CSA's Consumer Price Index with 2005 as the base year. The following ratios are used:

   - 2013 CPI/2005 CPI = 3.96;
   - 2018 CPI/2005 CPI = 5.68;

Poverty Thresholds

Using these elements, the new poverty line for the Feed the Future baseline became Birr13.61 per adult equivalent per day in 2013 prices. Similarly, the end-line poverty line for the Feed the Future was Birr19.53 per adult equivalent per day in 2018 prices.

A2.3 Criteria for Achieving Adequacy for Women's Empowerment in Agriculture Indicators

The table below presents the five Women's Empowerment in Agriculture (WEAI) domains of empowerment, their corresponding empowerment indicators, the survey questions that are used to elicit the data required to establish adequacy for each empowerment indicator, and how adequacy criteria are defined for each empowerment indicator. For additional details refer to the Feed the Future Guide to Statistics.

Dimension	Indicator name	Survey questions	Aggregation of adequacy criteria	Inadequacy criteria
Production	Input in productive decisions	G2.02 A-C, F How much input did you have in making decisions about: food crop farming, cash crop farming, livestock raising, fish culture; G5.02 A-D To what extent do you feel you can make your own personal decisions regarding these aspects of household life if you want(ed) to: agriculture production, what inputs to buy, what types of crops to grow for agricultural production, when or who would take crops to market, livestock raising	Must have at least some input into or can make own personal decisions in at least two decision-making areas	Inadequate if individual participates BUT does not have at least some input in decisions; or she does not make the decisions nor feels she could.
Resources	Ownership of assets	G3.02 A-N Who would you say owns most of the [ITEM]? Agricultural land, Large livestock, Small livestock, chicks etc.; Fish pond/equip; Farm equipment (non-mechanized); Farm equip (mechanized); Nonfarm business equipment; House; Large durables; Small durables; Cell phone; Non-agricultural land (any); Transport	Must own at least one asset, but not only one small asset (chickens, non-mechanized equipment, or small consumer durables)	Inadequate if household does not own any asset or only owns one small asset, or if household owns the type of asset BUT she does not own most of it alone

Dimension	Indicator name	Survey questions	Aggregation of adequacy criteria	Inadequacy criteria
	Purchase, sale or transfer of assets	G3.03-G3.05 A-G Who would you say can decide whether to sell, give away, rent/mortgage [ITEM] most of the time? G3.06 A-G Who contributes most to decisions regarding a new purchase of [ITEM]? Ag land; Large livestock, Small livestock; Chickens etc.; Fish pond; Farm equipment (non-mechanized); Farm equipment (mechanized)	Must be able to decide to sell, give away, or rent at least one asset, but not only chickens and non-mechanized farming equipment	Inadequate if household does not own any asset or only owns one small asset, or household owns the type of asset BUT she does not participate in the decisions (exchange or buy) about it
	Access to and decisions on credit	G3.08-G3.09 A-E Who made the decision to borrow/what to do with money/item borrowed from [SOURCE]? Non-governmental organization (NGO); Informal lender; Formal lender (bank); Friends or relatives; ROSCA (savings/credit group)	Must have made the decision to borrow or what to do with credit from at least one source	Inadequate if household has no credit OR used a source of credit BUT she did not participate in ANY decisions about it
Income	Control over use of income	G2.03 A-F How much input did you have in decisions on the use of income generated from: Food crop, Cash crop, Livestock, Nonfarm activities, Wage & salary, Fish culture; G5.02 E-G To what extent do you feel you can make your own personal decisions regarding these aspects of household life if you want(ed) to: Your own wage or salary employment? Minor household expenditures?	Must have some input into decisions on income, but not only minor household expenditures	Inadequate if participates in activity BUT she has no input or little input on decisions about income generated

Dimension	Indicator name	Survey questions	Aggregation of adequacy criteria	Inadequacy criteria
Leadership	Group member	G4.05 A-K Are you a member of any: Agricultural / livestock/ fisheries producer/ market group; Water, forest users', credit or microfinance group; Mutual help or insurance group (including burial societies); Trade and business association; Civic/charitable group; Local government; Religious group; Other women's group; Other group.	Must be an active member of at least one group	Inadequate if not an active member of a group or if unaware of any group in the community or if no group in community
	Speaking in public	G4.01 – G4.03 Do you feel comfortable speaking up in public: To help decide on infrastructure (like small wells, roads) to be built? To ensure proper payment of wages for public work or other similar programs? To protest the misbehavior of authorities or elected officials?	Must feel comfortable speaking in at least one public setting	Inadequate if not at all comfortable speaking in public
Time	Workload	G6 Worked more than 10.5 hours in previous 24 hours.	Total summed hours spent toward labor must be less than 10.5	Inadequate if works more than 10.5 hours a day
	Leisure	G6.02 How would you rate your satisfaction with your available time for leisure activities like visiting neighbors, watching TV, listening to radio, seeing movies or doing sports?	Must rate satisfaction level as at least five out of 10	Inadequate if not satisfied (<5)

[1] Time poverty is defined as performing productive or domestic work for more than 10.5 hours in a 24-hour period