FEED THE FUTURE

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

Feed the Future ZAMBIA

Zone of Influence Survey Endline Assessment

October 2012 - November 2018

USAID

FROM THE AMERICAN PEOPLE

This publication was prepared for review by the United States Agency for International Development.
USAID Agreement Number. AID-611-A-15-00006, Feed the Future

Recommended Citation:
Feed the Future. 2019. Feed the Future Zambia Zone of Influence Survey 2018 Endline Assessment.
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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 Surveys
EA	Enumeration Area
FTF	Feed the Future
FTFMS	Feed the Future Monitoring System
GPI	Gender Parity Index
ha	Hectares
HHS	Household Hunger Scale
IFPRI	International Food Policy Research Institute
LCMS	Living Conditions Monitoring Survey
LCU	Local Currency Unit
LSMS	Living Standards Measurement Survey
M&E	Monitoring and Evaluation
MAD	Minimum Acceptable Diet
MDD-W	Minimum Dietary Diversity for Women
MDG	Millennium Development Goal
MICS	Multiple Indicator Cluster Survey
NRVCC	Nutrient Rich Value Chain Commodities
NSO	National Statistics Office
PAD	Primary Adult Decisionmaker
PAFD	Primary Adult Female Decisionmaker
PAMD	Primary Adult Male Decisionmaker
PBS	Population Based Survey
PPP	Purchasing Power Parity
PPS	Probability Proportional to Size
RALS	Rural Agricultural Livelihoods Survey
SD	Standard Deviation

SDG	Sustainable Development Goal
SEA	Standard Enumeration Area
UNDP	United Nations Development Programme
UNECOSOC	United Nations Economic and Social Council
UNICEF	United Nations Children's Emergency Fund
USAID	United States Agency for International Development
USD	United States Dollar
USG	United States Government
WDDS	Women's Dietary Diversity Score
WEAI	Women's Empowerment in Agriculture Index
WHO	World Health Organization
ZMW	Rebased Zambian Kwacha
ZOI	Zone of Influence

4. EXECUTIVE SUMMARY

Background

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

The purpose of this report is to provide the U.S. Government interagency partners, the United States Agency for International Development (USAID), Bureau for Food Security, USAID/Zambia, the Government of Zambia (GRZ), and development partners with an assessment that compares indicator estimates and select demographic and household characteristics from the 2018 ZOI Survey, which serves as the FTF Phase One endline survey, with the baseline and interim assessments conducted in 2012 and 2015, respectively. This report assesses trends and statistically significant differences in indicator estimates between the three time periods in the Phase One ZOI (PI-ZOI) in Zambia. This report includes only FTF Phase One indicators.

The geographic focus of the Zambia P1-ZOI was determined by three criteria – number of smallholders, number of people living in poverty, and number of underweight children – along with the potential for commercialization of high-priority staple food crops. The Zambia P1-ZOI is comprised of populations in five districts - Chipata, Katete, Lundazi, Nyimba and Petauke of Eastern Province. Eastern Province hosts approximately 240,000 poor smallholders (15 percent of Zambia's total) among a total of 1.6 million people, and 23 percent of single-female headed households (FTF midline survey, 2015). Approximately 12.8 percent of the children under five years of age in the province are underweight while 43.3 percent are stunted (CSO, MoH and ICF, 2014). Due to its high population density, Eastern Province has the greatest number of extremely poor people (1,049,142) of all the provinces. Using poverty line of USD 1.25 per day (in 2005 USD), nearly 65 percent of all people living in Eastern province were considered extremely poor, well above the national average of 51 percent.).

About 22 percent of all farms in Eastern Province are less than one hectare (ha) in size. The Province accounts for 15 percent of all small (<1 ha) farms in Zambia. Relative to other high production provinces, Eastern Province has very few large-scale farms (>20 ha). Thus, Eastern Province has a substantial need for action, and offers the opportunity for maximum impact. In particular, the province offers a base for further agricultural diversification and it is linked to Zambian and international markets through the Lusaka-Lilongwe-Nacala transport corridor.

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

Endline Assessment Indicators

Thirteen FTF population-based ZOI indicators are included in this assessment:

1. Daily per capita expenditures (2010 United States Dollar (USD))
2. Prevalence of poverty: Percentage of people living on less than USD1.25/day 2005 PPP, USD1.90/day 2011 PPP, and national poverty thresholds
3. Depth of poverty: Mean percentage shortfall of the poor, relative to the same three poverty thresholds
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. Consumption of targeted nutrient-rich value chain commodities
13. Abbreviated Women's Empowerment in Agriculture Index (A-WEAI)[1]

Endline Assessment Data Sources

Data for the PI-ZOI indicators presented in this assessment are drawn from primary data collection. The Indaba Agricultural Policy Research Institute (IAPRI) conducted the survey in collaboration with the Zambia Central Statistical Office (CSO) and the National Food and Nutrition Commission (NFNC). Fieldwork for the endline assessment took place between October and November 2018.

Summary of Key Endline Assessment Findings

Household Economic Status

Daily Per Capita Expenditure: The average daily per capita expenditure is estimated at USD 0.91 in constant 2010 USD. About 50 percent of all individuals had daily per capita consumption expenditures less than USD 0.76. The per capita daily expenditure is higher among male only households compared to male and female households and female adults only households. Mean per capita daily expenditure is also higher among households with higher education attainment and households with smaller families (1-5 members).

Prevalence of Poverty: Approximately three-quarters (75.3 percent) of households live below the poverty line of USD 1.25 per day (in 2005 USD) in the Zambia PI-ZOI. The incidence of poverty is

[1] .The full WEAI was calculated and reported on at baseline; however, an abbreviated version of the WEAI (A-WEAI) has since been developed, and partial data for the A-WEAI were collected in the 2018 Zambia FTF ZOI Survey. Because data were collected only from female primary adult decisionmakers, only the Five Domains of Empowerment index (5DE) component of the A-WEAI could be computed.

highest among male and females only households, and among households with large families (with 11 or more members), and those with low educational attainment.

Depth of Poverty: The depth of poverty is estimated at 32 percent. This depth of poverty indicates that the average gap between consumption levels of the ZOI population and the poverty line is USD 0.40 (2005 PPP).[2]The poverty gap is lowest among male only households, households with secondary education attainment, or more and smaller households.

Hunger and Dietary Intake

Household hunger: About 22 percent of households in the ZOI experience moderate to severe hunger. The incidence of moderate to severe hunger is higher among female only households, larger households (with 11 or more members) and those with low educational attainment. When disaggregated, nearly 20 percent of the households in the ZOI experience moderate hunger. The incidence of moderate hunger is highest in female adult households at 29 percent and among large households (with 11 or more members) at about 22 percent. The prevalence of severe hunger is highest in male adult households at about 9.75 percent and among smaller (with 11 or less members). The prevalence of moderate and severe hunger is highest at 35.62 percent and 9.37 percent, respectively, for households with no education attainment.

Dietary diversity: Women aged between 15 – 49 years consume on average 4.37 food groups, and 34.9 percent of children aged 6 – 23 months receive a minimum acceptable diet (MAD). Approximately half (51.9 percent) of children under 6 months of age are exclusively breastfed.

Nutritional Status of Women and Children

About 6 percent of all non-pregnant women aged 15 – 49 years in the ZOI are classified as underweight. Underweight is more prevalent among young women aged 15 – 19 years and among women aged 40 – 49 years.

Stunting: One-third or 35.5 percent of all children under five years in the ZOI are stunted. The incidence of stunting is highest at 50 percent among children aged 24 – 35 months and lowest at 10 percent among younger children between 0 and 11 months.

Wasting: The incidence of acute malnutrition, measured by wasting or low weight-for-height is, 3.1 percent among all children under five years in the ZOI. Wasting is lower among older children 48 – 59 months, but higher at 7 percent among children 0 – 11 months.

Underweight: Nearly 10 percent (9.3 percent) of the children under five years were underweight, or had low weight-for-age in the ZOI. About 12 percent of children 12 – 23 months are underweight, compared to only 7 percent among younger children 0 – 11 months.

Women's Empowerment in Agriculture

[2] The overall poverty using the USD1.90 2011 PPP threshold is 86.83 percent with a depth of poverty at 48.81 percent

The 2018 Zambia ZOI PBS does not report on the FTF Indicator Abbreviated Women's Empowerment in Agriculture Index (A-WEAI) score, but does report on the six ten indicators that comprise the Five Domains of Empowerment (5DE). About 61.0 percent of women have achieved empowerment (a score of 0.80 or greater). The most common economic activities the women are engaged in are food crop farming and livestock raising. They generally have a high input (over 75 percent) into decisions over the economic activities they are engaged in. Among the nine empowerment indicators assessed at endline, women in the ZOI demonstrate inadequate achievement in 34.0 percent of the domains and the largest contributors to their disempowerment are group membership (43.78 percent) and access to and decision on credit (20.91 percent).

Measuring Change Over Time

The 2018 Zambia ZOI endline survey was designed to, among other things, assess changes in key indicators from the baseline in 2012. The table below shows the baseline, interim and endline indicator values and associated confidence intervals based on a 95% level of confidence. Non-overlapping confidence intervals between baseline and endline (or between interim and endline or baseline and interim) indicators indicate there were statistically significant changes in some of the indicators between the time periods. We denote such overlapping confidence intervals with the same superscript per row. Even if we report confidence intervals between baseline and interim, we focus more on changes between baseline and endline in the discussions. We are unable to perform statistical tests of significance in cases where confidence intervals overlap because we do not have the baseline and interim final datasets.

Although we cannot tell whether changes were statistically significant (due to overlapping confidence intervals), average daily per capita expenditure increased from USD 0.84 at baseline to USD 0.91 at endline. The prevalence of poverty significantly reduced by 12.66 percentage points (14 percent) from 88 to 75.34 percent between baseline and endline; while the depth of poverty reduced by 18.39 percentage points (36%) from 50.4 to 32.01 percent over the same period.

The average daily per capita expenditure increased between baseline and interim (0.84 to 0.89) but declined slightly to 0.88 at endline. A closer look at the distribution in section 4.1 shows that per capita daily expenditure was higher for the lower 50 percent of the population in the endline than it was in the interim, and expenditure declined for the top 25 percent between the interim and endline surveys. For example, the median per capita expenditure of USD 0.76 at the endline is higher than a median value of USD 0.63 at the interim.[3] This implies that daily per capita expenditure was becoming more equitable in the ZOI in the sense that per capita daily expenditures increased among the lower wealth quintiles.

The incidence of moderate to severe hunger barely changed from 23 percent at baseline to 22 percent at endline. This change is not statistically significant. The number of food groups consumed by women of productive age significantly increased from 4.00 at baseline to 4.37 at endline, as did the proportion of children aged 6 – 23 months receiving a MAD, which increased from 16.20 to 34.9 percent over the same period, and stunting in children under five years significantly reduced by 10.03 percentage points (22 percent) from 45.5 to 35.47 percent. While underweight reduced by 4.05 percentage points from 13.3 to 9.25 percent between baseline and endline, we cannot tell whether this change was statistically

[3]The distribution of daily per capita expenditure was not reported in the baseline.

significant. However, underweight did decrease significantly among male children, from 17.70 at baseline to 8.63 at endline, while basically remaining constant among female children (9.60 percent at baseline and 9.85 percent at endline.) We are also unable to assess if changes in the prevalence of underweight in women of productive age, and wasting in children under five years between baseline and endline were statistically significant.

Baseline, interim and endline estimates of indicator values in the ZOI are shown in the FTF ZOI Indicator Estimates table below

Feed the Future Zone of Influence Indicator Estimates: Zambia

Indicator	Baseline (2012)			Interim (2015)			Endline (2018)		
	Estimate	95% CI[1]	n	Estimate	95% CI[1]	n	Estimate	95% CI[1]	n
Daily per capita consumption expenditures in constant 2010 USD (2005 PPP)									
All households	0.84	0.76 – 0.93	1,431	1.01	0.89 – 1.14	1,214	0.91	0.88 - 1.93	1880
Male and female adults	0.83	0.75 – 0.91	1,168	0.99	0.86 – 1.12	992	0.85	0.83 - 0.88	1546
Female adults only	0.81	0.68 – 0.94	179	1.08	0.86 – 1.31	155	0.98	0.89 - 1.07	267
Male adults only	1.99	1.29 – 2.68	84	2.11	1.32 – 2.91	67	1.86	1.49 - 2.22	67
Prevalence of Poverty: Percentage of people living on less than $1.25/day (2005 PPP)									
All households	88.00 [ab]	85.4 – 90.6	1,431	80.90 [a]	77.1 – 84.8	1,214	75.34[b]	73.39 - 77.29	1880
Male and female adults	88.20 [a]	82.9 – 90.9	1,168	80.80	76.80 – 84.80	992	77.76 [a]	75.68 - 79.83	1546
Female adults only	88.90 [a]	82.9 – 94.8	179	85.60 [b]	79.60 – 91.50	155	70.72 [ab]	65.23 - 76.22	267
Male adults only	70.50 [a]	56.6 – 84.3	84	63.00	45.60 – 80.50	67	38.93 [a]	26.94 - 50.91	67
Depth of Poverty: Mean percent shortfall relative to the $1.25/day poverty line (2005 PPP)									
All households	50.40 [a]	46.9 – 53.8	1,431	47.30 [b]	43.20 – 51.30	1,214	32.01 [ab]	30.82 - 33.20	1880
Male and female adults	50.50 [a]	47.0 – 54.1	1,168	47.50 [b]	43.30 – 51.60	992	33.02 [ab]	31.72 - 34.31	1546
Female adults only	51.60 [a]	45.8 – 57.4	179	47.50 [b]	40.20 – 54.80	155	31.16 [ab]	27.85 - 39.05	267
Male adults only	31.00[a]	17.7 – 44.3	84	32.40 [ab]	20.20 – 44.50	67	12.81 [b]	7.71 - 17.92	67
Prevalence of moderate and severe hunger									
All households	23.20 [a]	20.0 – 26.4	1,491	31.90 [ab]	26.70 – 37.70	763	21.84 [b]	19.97 - 23.71	1880
Male and female adults	21.50 [a]	17.9 – 25.0	1,280	32.10 [ab]	26.60 – 38.10	689	19.56 [b]	17.58 - 21.54	1546
Female adults only	31.00	22.2 – 39.7	167	33.80	20.90 – 49.60	61	33.36	27.67 - 39.05	267
Male adults only	32.60	17.1 – 48.0	43	^	^	13	29.25	18.07 - 40.43	67
Women dietary diversity: Mean number of food groups consumed by women of reproductive age									
All women ages 15-49	4.01 [a]	3.90 – 4.12	1,549	4.84 [a]	4.65 – 5.03	932	4.37 [a]	4.30 - 4.43	1913
Prevalence of underweight women of reproductive age									
All non-pregnant women ages 15-49	6.30	4.4 – 8.3	1,383	5.10	3.40 – 7.80	830	5.53	4.44 - 6.61	1716
Prevalence of exclusive breastfeeding among children under age 6 months									

All children	^	^	23	43.70	26.90 – 62.10	54	51.90	44.00 - 59.80	157
Male children	^	^	9	^	^	28	48.16	37.11 - 59.20	82
Female children	^	^	14	^	^	26	56.05	44.55 -67.54	75
Prevalence of children 6-23 months receiving minimum acceptable diet									
All children	16.20 [a]	11.2 – 21.2	362	35.70 [ab]	26.30 – 46.30	206	34.92 [ac]	30.79 - 39.05	516
Male children	14.60 [a]	8.0 – 21.2	182	41.20 [ab]	27.90 – 55.90	108	35.86 [ac]	29.93 - 41.78	255
Female children	17.70 [a]	10.1 – 25.3	180	28.20	18.40 – 40.70	98	34.04 [a]	28.26 - 39.83	261
Prevalence of stunted children under age 5 years									
All children	45.50 [a]	41.2 – 49.9	1,114	38.40	32.10 – 45.10	650	35.47 [a]	33.04 -37.89	1499
Male children	51.20 [a]	44.8 – 57.6	529	41.40	33.90 – 49.30	346	35.79 [a]	32.32 - 39.25	739
Female children	40.80	35.5 – 46.0	585	34.30	26.30 – 43.30	304	35.16	31.75 - 38.56	760
Prevalence of wasted children under age 5 years									
All children	2.70	1.5 – 3.9	1,114	2.00	1.00 – 4.00	650	3.05	2.18 - 3.92	1501
Male children	4.10	1.9 – 6.2	529	3.40	1.70 – 6.90	346	2.98	1.75 - 4.20	743
Female children	1.50	0.2 – 2.9	585	0.00	-	304	3.12	1.88 - 4.36	758
Prevalence of underweight children under age 5 years									
All children	13.30	10.4 – 16.2	1,114	13.60	9.90 – 18.40	650	9.25	7.80 - 10.70	1535
Male children	17.70 [a]	13.9 – 21.4	529	15.90	10.60 – 23.00	346	8.63 [a]	6.62 - 10.64	756
Female children	9.60	6.4 – 12.9	585	10.40	5.20 – 19.90	304	9.85	7.75 - 11.95	779

Source(s): Zambia Feed the Future ZOI Baseline Survey, 2012; Zambia Feed the Future ZOI Interim Survey 2015; Zambia Feed the Future ZOI Endline Survey, 2018.

^ Results not statistically valid, n<30

[l] Confidence intervals (CIs) demonstrate the reliability of estimated values.

[abc] Subgroups with the same superscript have non-overlapping 95% confidence intervals, and are statistically different. Comparisons are within rows.

1. BACKGROUND

This chapter provides background information on Feed the Future in Zambia, including a description of the program and the Feed the Future (FTF) 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

Zambia's Phase One FTF Strategy is derived from the overall FTF framework,[4] the United States Agency for International Development (USAID) Zambia Country Development Cooperation Strategy,[5] and the Global Health Initiative objectives.[6] The objective of the Zambia FTF program is to reduce poverty in targeted rural areas and improve nutrition-related health status based on the following development hypothesis: *the diversification of staple crop production and consumption will increase food security and rural incomes, and contribute to a reduction of undernutrition in children under 5.*[7]

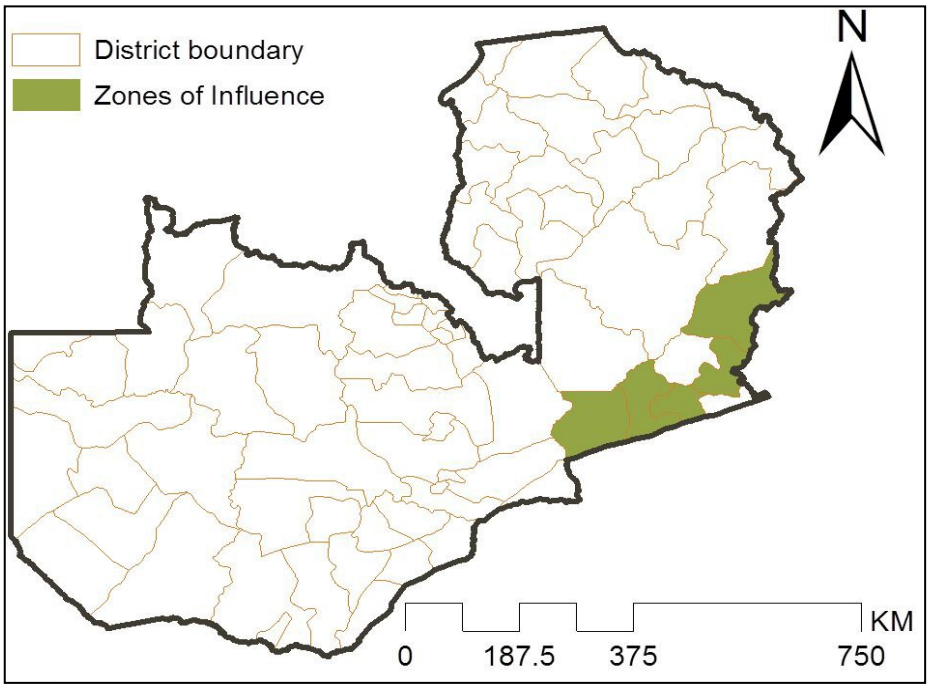
USAID Zambia's Phase One FTF Strategy aims to provide assistance to an estimated 263,000 Zambian women, children, and family members (mostly smallholders) through value chain and economic resilience interventions. The Zambia FTF program "seeks to build the economic resilience of households to improve food security, reduce vulnerability, and increase incomes." FTF in Zambia targets more than 173,000 children under 5 with services aimed at improving nutrition, preventing stunting, and reducing child mortality. To meet its objectives, FTF investments in four key areas: (1) oilseeds, legumes, maize, and horticulture value chains; (2) enabling environment through analysis and advocacy to improve agriculture policy; (3) economic resilience by improving household-level food security and ensuring gender equity; and (4) improving nutrition through a combination of scaling up nutrition efforts and strengthened health and nutrition systems. The FTF program targets poor and very poor smallholder households, female adult only households, and women within male and female adult households. Investments in the economic resilience of these households are directed to helping households to more efficiently manage their resources; encouraging more equitable intra-household allocation of those resources, especially food for women and children under 5; and supporting increased labor productivity through improved, labor-saving technology. In emphasizing resilience, Feed the Future Zambia also integrates activities that build assets with those that reduce risk, and seeks out innovative models to link vulnerable households to value chain interventions and investments in the country's health systems.

1.2 Feed the Future P1-ZOI Profile

The FTF P1-ZOI in Zambia covers five of seven districts in the Eastern Province. A map of the P1-ZOI is shown in Figure 1.1 below, covering Chipata, Katete, Lundazi, Nyimba and Petauke districts.

[4] USAID (2010).
[5] USAID (2011b).
[6] United States Government Zambia Interagency Team (2012).
[7] USAID (2011a).

Figure 1.1: Map of Zambia: Feed the Future P1-ZOI



1.2.1 Rationale for P1-ZOI selection

In consultation with a range of stakeholders, USAID Zambia selected Eastern Province as a key focus area based on a number of criteria: the high prevalence of poverty and nutritional challenges; availability of agricultural commodity value chains with positive gender, environment, and policy characteristics (socioeconomic) and potential for commercialization and scaling up (market/income opportunity); and availability of agents (and technologies) that could generate significant results.

Eastern Province hosts approximately 240,000 poor smallholders (15 percent of Zambia's total) among a total of 1.6 million people, about 39,700 (14 percent) underweight children under five years of age and 23 percent of single-female headed households. Due to its high population density, Eastern Province has the greatest number of extremely poor people (1,049,142) of all the provinces. Using poverty line of USD 1.25 per day (in 2005 USD),nearly 65 percent of all people living in Eastern Province were considered extremely poor, well above the national average of 51 percent. About 64 percent of children under five years of age are stunted in the province, well above the national average of 45 percent. In terms of absolute numbers Eastern province has the highest number of stunted children (115,885).

Smallholders in Eastern Province grow a wider range of crops than elsewhere in Zambia, thereby offering greater potential for crop diversification out of maize. The three most important crops grown in Eastern Province during the 2009/2010 agricultural season were maize (98.5 percent); groundnuts (69 percent) and sunflower (28 percent). The Province is home to 71 percent of all sunflower growers and 23 percent of all maize growers in the country. Cotton and tobacco are also important export crops

that are financed by international agribusinesses. Crop yields in the Eastern Province tend to be at or below national averages, with 48 percent of smallholders producing less than one tonne of maize per hectare (ha). However, the yield for mixed beans exceeds the national and even global averages, which probably results from the ability of farmers to produce two harvests of beans per year in the province.

About 22 percent of all farms in Eastern Province are less than one ha in size. The Province accounts for 15 percent of all small (<1 ha) farms in Zambia. Relative to other high production provinces, Eastern Province has very few large-scale farms (>20 ha). Thus, Eastern province has a substantial need for action, and offers the opportunity for maximum impact. In particular, the province offers a base for further agricultural diversification and it is linked to Zambian and international markets through the Lusaka-Lilongwe-Nacala transport corridor.

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 at baseline, interim, and endline. The tables include estimates of the total population and sub-populations. The sub-population categories correspond to the sub-populations for the FTF indicators and disaggregates (e.g. children aged 6-23 months, number of households). The P1-ZOI estimates for the total population of individuals as well as households are also disaggregated by gendered household type.

The PI-ZOI population figures presented for the endline are estimated using data collected from the endline assessment. The endline assessment estimates the population of the ZOI at 1,748,832 people (Table 1.1). About 16 percent of the ZOI population are children below the age of 5, of which the majority are female. Of the approximately 370,000 women of reproductive age (15-49 years), about 32,000 were pregnant at the time of the assessment. These trends are similar to the interim and baseline surveys where less than 2 percent were also children below 6 months, with the majority of the population being the youth.[8]

[8] This was not collected or reported in the baseline.

Table 1.1: Population of individuals, by category, in the P1-ZOI, Zambia by year

Category of Individuals	Estimate					
	Baseline (2012)		Interim (2015)		Endline (2018)	
	Percent	N	Percent	N	Percent	N
Total population	**100.00**	**1,509,302**	**100.00**	**1,609,112**	**100.00**	**1,748,832**
Total population, by sub–population						
Women of reproductive age (15-49 years)	20.60	310,915	22.79	366,643	21.09	368,853
Children 0-59 months	18.81	283,827	14.07	226,429	15.57	272,327
Children 0-5 months	0.35	5,210	1.60	25,792	1.63	28,524
Children 6-23 months	5.63	85,032	4.65	74,868	5.07	88,709
Children 6-59 months	18.46	278,617	12.47	200,637	13.94	243,802
Youth 15-29 years	n/a	n/a	29.00	466,714	26.77	468,121
Total population, by gendered household type						
Male and female adults	89.59	1,352,175	93.65	1,506,933	89.76	1,569,766
Female adults only	9.13	137,850	5.82	93,650	9.10	159,136
Male adults only	1.23	18,618	0.53	8,528	1.14	19,930
Children only (no adults)	0.04	661	0.00	0	0.00	0
Women of reproductive age, by pregnancy status						
Pregnant	2.22	33,559	1.86	29,883	1.81	31,597
Non–pregnant	18.13	273,707	20.93	336,760	17.47	305,545
Children 0-59 months, by gender						
Male	8.78	132,509	7.25	116,714	7.73	135,135
Female	10.37	156,570	6.82	109,715	7.84	137,192
Children 0-5 months, by gender						
Male	0.14	2,060	0.77	12,312	0.87	15,163
Female	0.21	3,150	0.84	13,480	0.76	13,361
Children 6-23 months, by gender						
Male	2.90	43,792	2.36	37,986	2.50	43,754
Female	2.81	42,449	2.29	36,882	2.57	44,955
Children 6-59 months, by gender						
Male	8.64	130,449	6.49	104,402	6.86	119,971
Female	10.16	153,420	5.98	96,235	7.08	123,831
Youth 15-29 years, by gender						
Male	n/a	n/c	13.80	222,043	13.86	242,354
Female	n/a	n/c	13.97	224,779	12.91	225,767

Source: Zambia Feed the Future ZOI Baseline Survey, 2012-2013; Zambia Feed the Future ZOI Interim Survey 2015; Zambia Feed the Future ZOI Endline Survey, 2018–2019

Note: Estimates for the endline derived from survey data and imputed to the population level. Estimates for baseline based on the census of population preliminary report, inflated to 2012 based on the annual growth rates.

Estimates for the interim are derived from population projections from the 2010 census obtained from the Central Statistical Office website. The disaggregated subgroups were based on the 2013/2014 Zambia Demographic and Health Survey (DHS).

Table 1.2 shows that the majority of households in the P1-ZOI include both male and female adults. Female adults' only household type is the second highest household type in the P1-ZOI. Unlike in the baseline when less than a percent of the household types was child headed, none of the sampled households in the endline survey were headed by a child.

In terms of population distribution by district, Chipata district had the highest proportion of households at 109,085 out of a total of 328,230 households. Nyimba district had the least number of households at 20,567.

Table 1.2: Number of households, by category, in the P1-ZOI, Zambia by year

	Baseline (2012)		Interim (2015)		Endline (2018)	
Category of households	**Percent**	**N**	**Percent**	**N**	**Percent**	**N**
Households in ZOI	**100.00**	**271,885**	**100.00**	**268,185**	**100.00**	**328,230**
Households, by gendered household type						
Male and female adults	83.71	227,584	90.70	243,244	82.42	270,543
Female adults only	12.96	35,226	7.88	21,133	13.87	45,530
Male adults only	3.22	8,744	1.41	3,781	3.70	12,157
Children only (no adults)	0.12	330	0.00	0	0.00	0
Households, by District						
Chipata	n/a	n/a	n/a	n/a	33.23	109,085
Katete	n/a	n/a	n/a	n/a	21.34	70,051
Lundazi	n/a	n/a	n/a	n/a	21.94	72,008
Nyimba	n/a	n/a	n/a	n/a	6.27	20,567
Petauke	n/a	n/a	n/a	n/a	17.22	56,519

Source: Zambia Feed the Future ZOI Survey, 2012-2013; Zambia Feed the Future ZOI Survey 2015; Zambia Feed the Future ZOI Survey2018–2019, n/a data not available

1.2.3 Agriculture in the P1-ZOI

Zambia is a large, landlocked country with considerable agricultural potential. Eastern Province has two distinct physiographic regions: a plateau with elevations ranging from 900 meters to 1,500 meters, and the Luangwa Valley, with an average elevation of 500 meters. The valley has alluvial soils suitable for crops such as rice, cotton, and drought-resistant sorghum and millet. Plateau soils are moderately fertile and suitable for cultivating maize, groundnuts, cotton, sunflower, tobacco, and soybeans.

Smallholder agricultural production typically relies on rainfall, as few of these farmers have access to irrigation. Unpredictable rainfall in Zambia can cause drought or flooding, and reduces food security for vulnerable communities and families. Rainfall variation tends to be greater in zones with low rainfall.

Annual rainfall in Eastern Province ranges from 850 mm to 1,050 mm, with a higher chance of droughts in the south and the southeastern parts of the province.

Zambia's agricultural production is dominated by small-scale farmers cultivating landholdings of 1 to 5 ha and producing most of the country's cotton, millet, and sorghum, along with maize, groundnuts, and sunflower. Given inadequate access to inputs such as inorganic fertilizer and improved seeds, improved technologies, and extension services, smallholder yields tend to be less than 15 percent of yields on commercial farms. Smallholder farm production is often not sufficient to produce surplus that could be sold in local markets or beyond, and may fail to meet household nutritional needs. Around 60 percent of these farming households face food insecurity during the lean season from November through February.

Agriculture contributes about 7 percent of national Gross Domestic product (GDP). While the agricultural sector grew at an average annual rate of 4.5 percent during the 1990s, subsequent years have seen much slower growth. Zambia's main food crops are sugar cane, maize, cassava, sweet potato, vegetables/fruits, groundnuts, and legumes. Cash crops including tobacco and vegetables have begun to increase in importance.

1.3 Purpose of this Assessment

The purpose of this assessment is to provide the U.S. Government interagency partners, USAID/BFS, USAID Missions, host country governments, and development partners with information to monitor long-term progress of the FTF phase one population-based ZOI indicators. The assessment was designed to generate indicator point estimates with statistical precision to assess change from the baseline. However, FTF P1-ZOI sample calculations were not designed to support conclusions of causality or program attribution.

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

This chapter describes the methodology used to obtain the FTF phase one 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 P1-ZOI indicators at endline are drawn from primary data collected using the Zambia FTF endline ZOI survey aligned to the baseline and interim surveys. No secondary data sources were available that met the specific criteria for the endline indicator assessment. However, both the baseline and interim surveys used secondary data sources to generate income and poverty estimates. Table 2.1 presents the data sources and dates of data collection for the baseline, interim, and endline FTF P1-ZOI indicators.

Table 2.1: Feed the Future phase one baseline, interim and endline ZOI indicator data Sources and dates of data collection

	Baseline		Interim		Endline	
	Data source	Date collected	Data source	Date collected	Data source	Date collected
Daily per capita expenditures (2010 USD)	LCMS	January/March, 2010	LCMS	April/May, 2015	FTF ZOI Endline Survey	October/November, 2018
Prevalence of poverty: Percentage of people living on less than USD1.25/day (2005 PPP)[1]	LCMS	January/March, 2010	LCMS	April/May, 2015	FTF ZOI Endline Survey	October/November, 2018
Depth of poverty: Mean percentage shortfall relative to the USD1.25/day (2005 PPP) poverty line[1]	LCMS	January/March, 2010	LCMS	April/May, 2015	FTF ZOI Endline Survey	October/November, 2018
Prevalence of moderate and severe hunger[1]	FTF FEEDBACK ZOI Survey	November/December 2012	FTF FEEDBACK ZOI Survey	November/ December 2015	FTF ZOI Endline Survey	October/November, 2018
Women's Dietary Diversity: Mean number of food groups consumed by women of reproductive age	FTF FEEDBACK ZOI Survey	November/December 2012	FTF FEEDBACK ZOI Survey	November /December 2015	FTF ZOI Endline Survey	October/November, 2018
Prevalence of underweight women of reproductive age	FTF FEEDBACK ZOI Survey	November/December 2012	FTF FEEDBACK ZOI Survey	November/ December 2015	FTF ZOI Endline Survey	October/November, 2018
Prevalence of exclusive breastfeeding among children under age 6 months	FTF FEEDBACK ZOI Survey	November/December 2012	FTF FEEDBACK ZOI Survey	November/ December 2015	FTF ZOI Endline Survey	October/November, 2018
Prevalence of children 6-23 months receiving a minimum acceptable diet	FTF FEEDBACK ZOI Survey	November/December 2012	FTF FEEDBACK ZOI Survey	November/ December 2015	FTF ZOI Endline Survey	October/November, 2018
Prevalence of stunted children under age 5 years	FTF FEEDBACK ZOI Survey	November/December 2012	FTF FEEDBACK ZOI Survey	November/ December 2015	FTF ZOI Endline Survey	October/November, 2018
Prevalence of wasted children under age 5 years	FTF FEEDBACK ZOI Survey	November/December 2012	FTF FEEDBACK ZOI Survey	November/ December 2015	FTF ZOI Endline Survey	October/November, 2018
Prevalence of underweight children under age 5 years	FTF FEEDBACK ZOI Survey	November/December 2012	FTF FEEDBACK ZOI Survey	November/ December 2015	FTF ZOI Endline Survey	October/November, 2018
Abbreviated Women's Empowerment in Agriculture Index	FTF FEEDBACK ZOI Survey	November/December 2012	FTF FEEDBACK ZOI Survey	November/ December 2015	FTF ZOI Endline Survey	October/November, 2018

2.1.1 Primary data: Survey Design and Sample Size

This section describes the FTF Zambia ZOI Survey 2018–2019, including a discussion on 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 FTF endline survey was conducted in the same enumeration areas (EAs) as the baseline and interim FTF surveys plus 12 additional EAs, all of which used the EA sampling frame from the Rural Agricultural Livelihoods Survey (RALS). The RALS is a nationally representative panel survey, designed to generate district valid statistics in Eastern Province, the USAID/Zambia ZOI. Specifically, the areas of Zambia's ZOI sample comprise rural and peri-urban EAs in the following five districts in Eastern Province: Chipata, Katete, Lundazi, Nyimba, and Petauke. Classification of rural and peri-urban standard enumeration areas (SEAs) draws on information from Zambia's 2000 Census of Population and Housing. A total of 16,746 SEAs were defined for the 2000 Zambia census, of which 12,202 are classified as rural and 3470 are in the ZOI. The sampled households in the FTF endline assessment were spread across 94 rural EAs across the five ZOI districts, of which 82 EAs were from the baseline survey based on RALS 2012. An additional 12 EAs were sampled from the 3470 EAS (less the 82 EAs from baseline) in the ZOI in order reach the target sample size of 1,880 households. As discussed in the study limitations, the selection of the 12 additional EAs at a later stage from the same sampling frame as the 82 EAs presented a dual sample problem that had potential to bias the results if not dealt with at analysis stage. However, reanalysis of a few key indicators to understand the full implications of the dual sample frame issue showed that the impact was minimal hence no re-estimation of the results correcting for the problem was necessary.

Unlike the baseline and interim surveys that re-visited a subset of RALS 2012 and 2015 households respectively, the endline survey re-listed households in RALS sample EAs to sample new households following FTF-PBS-Sampling guidelines.[9] 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 2012 ZOI Survey to the 2018 ZOI endline Survey.

The sample selection for the 1880 households drawn from the initial 82 EAs and the additional 12 EAs each involved a three stage stratified random cluster sampling design. The first stage of sampling involved selection of primary sampling units, EAs, within each stratum (district) using probability proportional to size (PPS) method with the total number of households per cluster as the measure of size (MOS). EAs were selected from a sampling frame composed of 3,470 (for the initial sample of 82 EAs) and 3,388 (for the second sample of 12 EAs) rural EAs in Chipata, Katete, Lundazi, Nyimba, and Petauke.

The second stage of sampling was the selection of households within the sample EAs. All the households within selected EAs were listed. The eligible households within an EA were assigned sampling serial numbers and the sampling interval was computed by dividing the total number of households by sample size per cluster (20). The sampling of households used a circular systematic random sampling which meant that the random start was between 0 and the total number of households in the cluster. To

[9] https://www.fantaproject.org/sites/default/files/resources/FTF-PBS-Sampling%20Guide-Apr2018.pdf

ensure that the target sample of 1880 was reached, field teams were provided with five extra randomly selected households for replacements in case there were non-contacts or refusals. Quality controllers had to authorize these replacements after verifying that the household was not available to be interviewed. A total of 51 households were replaced using this procedure. However, a reviewer pointed out that this posed a problem because instead of randomly selecting the required 20 households from the 25 sampled, the first 20 randomly selected households became the 'core' sample while the remaining 5 were used as 'replacement' households in the case of non-response. The procedure did not allow for unbiased replacement of non-responding households. With only 51 replacements, it was recommended that it was not necessary to recompute the weighting scheme to take into account of this problem because the impacts on the estimates would be negligible. Table 2.1.1 summarizes the sample distribution across the Zambia ZOI.

Table 2.1.1 Feed the Future endline ZOI sample distribution

District	Total EAs in District per 2000 Census	FTF End line Survey sample Eas	Households in sample EAs	FTF End line Survey Sampled Households
Chipata	812	24	2239	480
Katete	576	20	1905	400
Lundazi	769	20	1726	400
Nyimba	184	10	1248	200
Petauke	744	20	1757	400
Total	**3470**	**94**	**8875**	**1880**

Finally, in the third stage, eligible household members were selected using a "take all" sampling approach, meaning that all household members who met the eligibility criteria were included in the sample. These included all children under the age of 5 for stunting, wasting, and healthy weight indicators; all children under the age of 2 for feeding behaviors; all women aged 15-49 for underweight and minimum dietary diversity indicators; and women primary decision makers aged 18 and above for the women's empowerment in agriculture index. No sub-sampling among eligible respondents occurred.

Determination of Sample Size

Sample sizes were calculated for several key FTF indicators, including poverty, daily per capita expenditures, women dietary diversity, stunting and underweight. These calculations were based on the guidance provided by USAID Feed the Future Population-Based Survey Sampling Guide. The sample size was calculated to provide estimates of the population- based indicators with an acceptable level of statistical accuracy for the FTF goal-level indicators in the P1-ZOI. All sample sizes were adjusted for nonresponse using a projected 10 percent non-response rate.

Table 2.1.2 shows the estimated sample sizes by indicator. The final sample size was driven by the stunting indicator, which required a sample of 1880 households to detect 15 percent change over baseline.

Table 2.1.2 Sample size estimate for the key indicators

Indicator	Baseline value1	DEFF 1	End line Estimate	Change to Detect (%)	Number of households needed
Poverty	79.75	1.93	64.75	20	532
Per capita expenditure	1.19	1.75	0.91	20	978
Underweight in children under 5	13.28	2.00	9.25	15	1290
Stunting	45.50	3.30	35.47	15	1875
Household hunger	23.18	2.20	18.00	10	669
Women's Dietary Diversity	4.01	3.43	5.00	25	86
Prevalence of exclusive breastfeeding of children <6 months	60.9	2.00	79.2	30	1354

[1] Baseline value and design effect as reported in the Interim report Table 2.2

More information about the sampling and weighting methodology is presented in Appendix 2.

Questionnaire design

The Zambia 2018 FTF ZOI Survey Instrument included modules from both the baseline and interim surveys and the core questionnaire provided by BFS. Additional modules were included to the core BFS ZOI survey questionnaire which included questions on farm land and use, livestock, poultry and fish farming, agricultural information, distances to and cost of agricultural services, and modified household expenditure module based on LCMS 2010. . The Zambia endline questionnaire included all modules needed to calculate P1-ZOI Feed the Future indicators. The survey instrument was in English but interviews were translated and conducted in about four main local languages (Tumbuka, Chewa, Nsenga and Nyanja) prevalent in specific parts of Eastern Province.

Fieldwork and survey organization

Prior to fieldwork, all field staff were trained in survey procedures, including preparing for fieldwork, questionnaire content, human subject protection, fieldwork procedures, data management, reporting, and communications. Enumerator training was conducted in both English and local languages to ensure consistency in the translation of certain words and phrases. The questionnaire was provided to the field teams in hardcopy and loaded on the tablets in both portable document format and Surveybe as Computer Assisted Personal Interviewing (CAPI). The questionnaire and data entry program were tested at the IAPRI office to ensure that the data entry program was error-free and fully functional. Subsequently, during the training of trainers, the questionnaire, the data entry program, and the transmission procedures were all tested. At the end of enumerator training, pilot testing served as an end-to-end rehearsal of all content and survey procedures. Training was hands-on with practice sessions covering the use of all technical equipment, CAPI pretest, and a full pilot survey in clusters outside the final sample.

There were 20 enumeration/field teams charged with data collection, four in each of the five districts in the ZOI. Each field team had one lead supervisor, one assistant supervisor, four enumerators and one driver. Field data collection in each district was supervised by a team of three quality controllers that

were in charge of monitoring the field work (field supervision, technical, and administrative support). The quality control teams had staff members from IAPRI, Central Statistical Office (CSO), and the National Food and Nutrition Commission (NFNC). Quality control teams were supervised by assistant survey managers. The survey manager provided overall coordination of the fieldwork. Fieldwork was conducted between 10th October and 13th November 2018.

Limitations of the Survey

ZOI Survey 2018–2019 sample size: An important limitation of the survey is that the sample size calculation was not constructed to show statistically valid results at the disaggregate level. For example, some of the sample sizes for individual indicators were too small for meaningful analysis.

Table 2.2 presents the response rates for the Zambia P1-ZOI Endline Survey. The table presents components and the response rates for the sampled households, women of reproductive age (15-49 years), primary adult female decision makers, and children under 5 years.

Sampling issues: There are two limitations with the sampling procedure used in the endline survey. First, the selection of the 12 additional EAs during the 2018 FtF endline survey in Zambia presents a dual sample frame issue because these 12 additional EAs were selected at a later stage from the same sampling frame as the 82 EAs. The dual sample frame problem has the potential to bias estimates if it is not accounted for at sample weighting and the analysis stage. Because the problem was pointed out by one of the reviewers at the last stage of the review process, it became necessary to reanalyze a few key indicators to understand the full implications of the dual sample frame issue on ZOI estimates. This was done in order to check if the current estimates in the report deviate significantly from the estimates drawn from sample weights and analysis that does not account for the dual sample frame issue. To do this, we 1) recomputed sample weights to account for the fact that the 82 and 12 EAs were selected in independent sample draws, rather than computing the sample weights as if all 94 EAs were selected in a single sample draw, and 2) re-analyzed the prevalence of poverty, stunting and expenditure per capita indicators for the 82 and 12 EA subsamples separately and obtained the indicator estimate and variance for each indicator. We then combined these estimates into a final variance-weighted estimate for all the 94 EAs. We tested the analysis on these three metrics per recommendation before investing a lot of time in redoing all the estimates reported in the endline report.

Table 2.1.3 shows the results from the re-analysis. The estimates under the rows '94 – old weights' and '94 – new weights' present how the results differ if only the sample weights are recomputed, while the estimates under the rows '94 - old weights' and '82 and 12 combined' show how the results differ if the sample weights and the analytic approach are changed. While the estimates reported in the endline report do not account for the dual sampling frame, the results show that these are not significantly different from estimates that do account for the dual sampling frame problem. As such, it was concluded that there was no need to re-calculate all the indicator estimates presented in the endline report.

Table 2.1.3 Comparison of prevalence of poverty, stunting and mean consumption expenditure with and without accounting for the dual sample frame problem

Prevalence of poverty at $1.25*					
Enumeration areas (EAs)	Mean	Variance	CI (lower)	CI (upper)	n
94 – old weights	75.34	0.19	73.39	77.29	1880
94 – new weights	75.68	0.18	73.74	77.63	1880
82 and 12 combined	77.17	0.08	77.16	77.18	1880
Prevalence of stunting among children under 5 years[1,2]					
94 – old weights	35.47	0.23	33.04	37.89	1499
94 – new weights	35.41	0.23	32.99	37.83	1499
82 and 12 combined*	35.42	0.23	32.99	37.84	1499
Consumption expenditure characteristic (in 2010 USD at 2005 PPP)[1]					
94 – old weights	0.91	0.41	0.88	0.93	1880
94 – new weights	0.90	0.38	0.87	0.92	1880
82 and 12 combined	0.90	0.21	0.86	0.92	1880

Source: Zambia Feed the Future ZOI Survey, 2018–2019

[1] Estimates for the combined 82 and 12 EAs are drawn from the non-overlap areas only, which are the estimates for the 82 and 12 EAs separately. Because the 82 EAs were removed from the frame before sampling the additional 12, there was no overlap area, hence, no indicator estimates for the overlap area were computed but set to zero.

[2]Based on the 82 EAs only as we could not compute stunting estimates for the 12. Coincidentally, the 240 households in the 12 EAs are among the 381 households which did not have children under five.

The second sampling limitation involves how the replacement households were chosen and utilized. Initially, 25 households were randomly sampled from each EA using fractional interval systematic sampling. The selection of 25 households instead of 20 was done to provide 5 potential replacement households per EA. However, instead of randomly selecting the required 20 households from the 25 sampled, the first 20 randomly selected households became the 'core' sample while the remaining 5 were used as 'replacement' households in the case of non-response. Thus, the first 20 households were used for survey first and in case of non-response, the first replacement to be used was the 21st household and so forth. However, the computation of the sampling weights were not adjusted to account for this procedure.[10] However, since only a small proportion of the sample was replacement households, the weight adjustment was not done because the effect on the estimates is likely to be negligible

Seasonality Challenges: Finally, similar to the baseline and interim surveys, results for the HHS do not show within the year seasonal variations since the data was collected at one particular time of the year.

Additionally, poverty indicators in the baseline and interim reports were based on the LCMS 2010 LCMS) 2015 respectively. Also, the LCMS and endline survey were conducted in different seasons. The

[10] The recommended weighting adjustment was supposed to follow the formula: $f_{hijk} = \frac{(20+r_i)}{25} X \frac{25}{N_{hij}} = \frac{(20+r_i)}{N_{hij}}$ where r_i is the number of replacements used for i[th] EA, 25 is the total number of (20 core plus 5 replacements) households randomly sampled from each EA and N_{hij} is the total number of households in the particular

endline survey was conducted in October/November (hot and dry season) whilst the 2010 LCMS was conducted in January/March and the 2015 LCMS was conducted in April-May at the end of the rainy season and beginning of cool dry season.

Table 2.2: Results of the household and individual interviews for the P1-ZOI endline Survey in Zambia 2018

Response rates	Baseline (2012)	Interim (2015)	Endline (2018)
Households			
Households selected	n/a	820	1,880
Households occupied	n/a	775	1,880
Households interviewed	n/a	768	1,880
Household response rate (%)[1]	n/a	99.1	100
Women of reproductive age (15-49 years)			
Number of eligible women	n/a	1,016	2,086
Number of eligible women interviewed	n/a	932	1,913
Eligible women response rate[2]	n/a	91.7	91.71
Primary adult female decisionmakers (18+ years)			
Number of eligible women	n/a	752	1,811
Number of eligible women interviewed	n/a	739	1,745
Primary adult female response rate[2]	n/a	98.3	96.4
Primary adult male decisionmakers (18+ years)			
Number of eligible men	n/a	n/a	n/a
Number of eligible men interviewed	n/a	n/a	n/a
Primary adult male response rate[2]	n/a	n/a	n/a
Children under 5 years of age			
Number of eligible children	n/a	715	1,624
Number of caregivers of eligible children interviewed	n/a	705	1,560
Eligible children response rate[2]	n/a	98.6	96.06

Source: Zambia Feed the Future ZOI Survey 2015; Zambia Feed the Future ZOI Survey, 2018–2019

[1] 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.

[2] Individual response rates are calculated based on the result codes in the relevant individual modules, (Modules 7, 8, and 9). These rates are defined as the number of eligible individuals interviewed divided by the number of eligible individuals. Eligibility is determined in Modules 7, 8, and 9, respectively. (Note that for children under 5 years of age [Module 9], the primary caregivers of the children served as the respondents, not the children directly.)

n/a data not available

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 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 when 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, 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.

Child Gender

Gender, either male or female, is a standard disaggregate for the tables presenting children's indicators, e.g., children's anthropometry in Tables 6.3, 6.4, and 6.5.

Household educational attainment

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); 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.

Individual educational attainment

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 who 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 FTF* notes that household-level indicators should be disaggregated by "gendered household types". That is, by: (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 adults, but no female adults, (3) households in which members include female adults, but no male adults, and (4) households in which all members are under age 18 (households with children only and no adult members). This approach to conceptualizing household type is distinct from the standard "head of household" approach, which is embedded with presumptions about household gender dynamics and may perpetuate existing social inequalities and prioritization of household responsibilities that may be detrimental to women. This variable is calculated using data on 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. 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 surveys, household size is defined as the total number of people who: (1) are reported to be usual members of the household; and (2) who have spent the night in the household within the past six months. 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 other household survey programs may use a slightly different definition of household member from that used in the ZOI surveys.

2.2.2 Reporting conventions

The Feed the Future Zambia Zone of Influence Survey 2018–2019 Endline/Baseline 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.
- Estimates from the endline are mostly shown to two decimal places. Estimates obtained from the baseline and interim reports will have estimates shown to one or two 2 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 the 95% confidence intervals. Statistical significance based on non-

overlapping 95% confidence interval is denoted with matched superscript letters attached to the row. Explanatory table footnotes clarify the meaning of the annotations, and statistically significant results are highlighted in the narrative throughout the report. Analyses are performed in Stata using various descriptive commands capable of handling data collected through the use of complex survey designs, including sampling weights, cluster sampling, and stratification.

3. ZOI Survey 2018–2019 P1-ZOI population

This chapter describes the background characteristics of the P1-ZOI population using data from the ZOI endline survey and documents any changes in demographic and household characteristics that occurred since the baseline and interim surveys in 2012 and 2015 respectively.

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 for household education, defined as the highest level of education of any member of the household.

Table 3.1a shows that households in the ZOI have an average size of 5 persons per household. On average, there is slightly less than one child under five in all household types.

Most households (about 47 percent) had at least one member with a primary level of education. Within male adult-only households, about 16 percent include a member who attained a secondary education or higher; comparatively, only 3 percent of female adult-only households include a member who attained a secondary education or higher. About half of all female adults-only households had at least one member who had only attained less than a primary education.

Table 3.1b compares the demographic characteristics of households in the P1-ZOI at baseline, interim and endline. 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 decisionmaker and the percentage of households with a female primary adult decisionmaker are also provided. Household education, defined as the highest level of education of any member of the household, is also presented in this table.

Table 3.1b shows a reduction in the proportion of households with members who had no education from 6.30 percent to 4.23 percent in the interim and endline respectively. There was also an increase in the proportion of households with a household member who had only attained less than primary education, from 35.20 percent to 37.82 percent.

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	5.33	5.80	3.50	1.64	-
Mean number of adult female household members[1,2]	1.28	1.33	1.32	0.00	-
Mean number of children (<2 years)[1]	0.37	0.42	0.20	0.05	-
Mean number of children (0-4 years)[1]	0.87	0.96	0.54	0.09	-
Mean number of children (5-17 years)[1]	2.00	2.13	1.64	0.37	-
Mean percentage of adults who are female (%)[1,2]	54.47	49.26	100.00	0.00	-
Highest education level attained (%)					
No education	4.23	2.19	12.08	20.22	-
Less than primary	37.82	35.18	53.18	39.24	-
Primary	47.05	50.68	31.60	24.08	-
Secondary or more	10.90	11.95	3.14	16.46	-
n[3]	**1,880**	**1,546**	**267**	**67**	**0**

Source: Zambia Feed the Future ZOI Survey, 2018

[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 Comparison of household demographic characteristics between the Feed the Future phase one baseline and endline ZOI Survey

Characteristic	Baseline (2012)	Interim (2015)	Endline (2018)
Mean household size	5.54	5.90	5.33
Mean number of adult male household members[1,2]	n/a	n/a	1.19
Mean number of adult female household members[1,2,3]	n/a	1.30	1.28
Mean number of children (<2 years)[1]	0.23	0.40	0.37
Mean number of children (0-4 years)[1]	0.96	0.90	0.87
Mean number of children (5-17 years)[1]	2.11	2.40	2.00
Mean percentage of adults who are male (%)[1,2]	n/a	n/a	45.53
Mean percentage of adults who are female (%)[1,2,3]	n/a	53.70	54.47
Mean percentage of households with a primary male decisionmaker (%)[4]	n/a	n/a	82.38
Mean percentage of households with a primary female decisionmaker (%)[4]	n/a	n/a	96.17
Highest education level attained (%)			
No education	n/a	6.30	4.23
Less than primary	n/a	35.20	37.82
Primary	n/a	48.70	47.05
Secondary or more	n/a	9.70	10.90
n[5]		**768**	**1,880**

Source: Zambia Feed the Future ZOI Survey, 2012-2013; Zambia Feed the Future ZOI Survey 2015; Zambia Feed the Future ZOI Survey, 2018–2019

n/a data not available

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

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

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

[4] Primary decisionmaker is the adult in the household who makes the socioeconomic decisions in the household. There can be both a female and male primary decisionmaker in the same household, although there may only be one or the other, or neither if there are no adults in the household.

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

Tables 3.2a and 3.2b present characteristics of the female and male primary adult decisionmakers in the sampled households in the P1-ZOI and changes in their characteristics since the baseline survey. The female and male primary adult decisionmakers 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 decisionmaking within the household. When both exist within a single household, female and male primary adult decisionmakers are typically, but not necessarily, husband and wife. Table 3.2a shows the age group, marital status, educational attainment, and participation in economic activity for these household members.

Table 3.2a Characteristics of female and male primary adult decisionmakers in the P1-ZOI

Characteristic	Female		Male	
	%	n	%	n
Age				
18-24	19.16	1811	10.87	1532
25-29	13.92	1811	16.22	1532
30-39	25.66	1811	29.31	1532
40-49	15.46	1811	19.03	1532
50-59	12.56	1811	11.88	1532
60+	13.24	1811	12.69	1532
Marital status				
Married	77.00	1745	n/a	n/a
Living in a consensual union	2.00	1745	n/a	n/a
Widowed	11.00	1745	n/a	n/a
Divorced or separated	9.00	1745	n/a	n/a
Never married or in a union	1.00	1745	n/a	n/a
Highest educational attainment				
No education	23.60	1811	14.86	1532
Some primary education	51.81	1811	40.09	1532
Completed primary education	12.29	1811	15.12	1532
Some secondary education	9.83	1811	21.86	1532
Completed secondary education or higher	2.46	1811	8.08	1532
Economic activity[1]				
Participates in some form of economic activity	98.26	1745	n/a	n/a
Participation in economic activity by type[2]				
Farm	96.73	1745	n/a	n/a
Non–farm	31.30	1717	n/a	n/a
Wage/salaried	36.70	1717	n/a	n/a

Source: Zambia Feed the Future ZOI Survey, 2018–2019

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

[2] Farm work includes *food crop farming, cash crop farming, livestock raising, or fishing/fishpond culture*; non-farm work includes *running small businesses or self-employment*; and wage/salaried employment includes both agriculture or non-agriculture work that is salaried. Percentages do not add up to 100 percent because individuals can engage in more than one type of economic activity.

n/a data not available

From the table above, we see that less than 33 percent of households have female decisionmakers that are 29 years of age and below. The majority of the female decision makers are currently married, have some primary education and participate in farming activities.

Table 3.2b compares the characteristics of the primary adult male and female decisionmakers between the FTF baseline, interim and endline P1-ZOI Surveys. The table compares age group, marital status, literacy status, educational attainment, and participation in economic activity for household members.

Table 3.2b shows that there has been an increase in the proportion of male decisionmakers aged 29 years and below between the interim and endline surveys, whilst there is a reduction in the proportion of households with male decisionmakers aged 40 years and above. This is also true for the proportion of female decisionmakers aged 50 to 59 years, which dropped from 16.4 percent to 12.6 percent between the interim and endline respectively. There was an increase in the proportion of female decisionmakers aged 18 to 24 from 12.2 percent in the interim to 19.2 percent in the endline.

Table 3.2b Comparison of characteristics of the female and male primary adult decisionmakers between the Feed the Future phase one baseline and endline ZOI Surveys in the P1-ZOI

Characteristic	Female		Male		Female		Male	
	%		%		%		%	
	Baseline (2012)	Endline (2018)	Baseline (2012)	Endline (2018)	Interim (2015)	Endline (2018)	Interim (2015)	Endline (2018)
Age								
18-24	n/a	19.16	n/a	10.87	12.2	19.16	6.9	10.87
25-29	n/a	13.92	n/a	16.22	14	13.92	9	16.22
30-39	n/a	25.66	n/a	29.31	26.8	25.66	31.3	29.31
40-49	n/a	15.46	n/a	19.03	16.1	15.46	21.1	19.03
50-59	n/a	12.56	n/a	11.88	16.4	12.56	15	11.88
60+	n/a	13.24	n/a	12.69	14.5	13.24	16.7	12.69
Marital status								
Married	n/a	77	n/a	n/a	n/a	77	n/a	n/a
Living in a consensual union	n/a	2	n/a	n/a	n/a	2	n/a	n/a
Widowed	n/a	11	n/a	n/a	n/a	11	n/a	n/a
Divorced or separated	n/a	9	n/a	n/a	n/a	9	n/a	n/a
Never married or in a union	n/a	1	n/a	n/a	n/a	1	n/a	n/a
Literacy								
Literate[2]	n/a	40.64	n/a	67.25	37.5	40.64	66.9	67.25
Level of educational attainment								
No education	n/a	23.6	n/a	14.86	n/a	23.6	n/a	14.86
Some primary education	n/a	51.81	n/a	40.09	n/a	51.81	n/a	40.09
Completed primary education	n/a	12.29	n/a	15.12	n/a	12.29	n/a	15.12
Some secondary education	n/a	9.83	n/a	21.86	n/a	9.83	n/a	21.86
Completed secondary education or higher	n/a	2.46	n/a	8.08	n/a	2.46	n/a	8.08
Economic activity[3]								

Participates in some form of economic activity	n/a	98.26	n/a	n/a	99.4	98.26	n/a	n/a
Participation in economic activity by type[4]								
Farm	n/a	96.73	n/a	n/a	n/a	96.73	n/a	n/a
Non–farm	n/a	31.3	n/a	n/a	37.7	31.3	n/a	n/a
Wage/salaried	n/a	36.7	n/a	n/a	23.4	36.7	n/a	n/a

Source: Zambia Feed the Future ZOI Survey, 2012-2013; Zambia Feed the Future ZOI Survey 2015; Zambia Feed the Future ZOI Survey, 2018–2019and endline estimates was conducted.

[2] The percentage who are literate includes those who report that they can both read and write.

3 Both paid and unpaid types of economic activity are included. Domestic work, such as caring for children, the elderly, cooking, and clean are not included.

[4] Farm work includes *food crop farming, cash crop farming, livestock raising, or fishing/fishpond culture*; non-farm work includes *running small businesses or self-employment*; and wage/salaried employment includes both agriculture or 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.

n/a not available

3.2 Living conditions

Table 3.3a shows dwelling characteristics of the households in the P1-ZOI at baseline, interim, and endline. Many of these measures align with the Sustainable Development Goals (SDGs) definitions (UNSTATS, n.d.). The table presents the percentage of households that 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.

Table 3.3a reveals that there has been an increase in the proportion of households with access to improved water sources from about 75 percent of the households in the baseline survey, to about 84 percent at endline. The percentage of households with access to electricity remains very small, less than 1 percent.[11] There is a reduction in the average number of people sleeping per room between the interim and the endline survey.

With regards to the types of material used for roofing, the results show that natural and finished roofs were the most popular among rural households. There is a reduction in the use of natural roofing material and an increase in the use of finished roofing material between the interim and endline survey. The results also show a reduction in the percentage of households that used rudimentary household exterior wall material from 1.7 percent of the households in the interim to 0.05 percent of the households in the endline survey.

[11]The estimate for access to electricity in the interim appears implausible given that the national level estimates for access to electricity in rural areas is less than 4 percent.

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

Characteristic	Estimate		Estimate	
	Baseline (2012)	Endline (2018)	Interim (2015)	Endline (2018)
Percentage with improved water source (%)[1]	74.60	83.54	81.30	83.54
Percentage with improved sanitation, not shared (%)[2]	n/a	24.45	9.6	24.45
Percentage with improved sanitation, shared (%)[2]	n/a	12.04	n/a	12.04
Percentage with unimproved sanitation (%)[3]	n/a	63.45	n/a	63.45
Percentage practicing open defecation (%)[4]	n/a	17.50	n/a	17.50
Percentage using solid fuel for cooking (%)[5]	n/a	99.37	98.60	99.37
Percentage with access to electricity (%)[6]	0.89	0.63	30.20	0.63
Mean number persons per sleeping room[7]	n/a	2.59	2.80	2.59
Household roof materials (%)[8]				
Natural	n/a	47.09	51.40	47.09
Rudimentary	n/a	0.02	0.10	0.02
Finished	n/a	52.89	48.60	52.89
Household exterior wall materials (%)[9]				
Natural	n/a	48.01	50.70	48.01
Rudimentary	n/a	0.05	1.70	0.05
Finished	n/a	51.93	47.60	51.93
Household floor materials (%)[10]				
Natural	n/a	73.58	77.00	73.58
Rudimentary	n/a	0.02	0.00	0.02
Finished	n/a	26.40	23.00	26.40

Sources: Zambia Feed the Future ZOI Survey 2015; Zambia Feed the Future ZOI Survey, 2018–2019

[1] 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.

[2] 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).

[3] 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).

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

[5] 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).

[6] The estimate for access to electricity in the interim appears implausible given that the national level estimates for access to electricity in rural areas is less than 4 percent.

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

[8] 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.

[9] 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.

[8]

[10] 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.

n/a data not available

Table 3.3b presents the dwelling characteristics of households in the P1-ZOI by gendered household type. No comparison can be made with the baseline or interim because information on household dwelling by gendered household type was not reported for the baseline and interim and no statistics are reported for the child only households because there were none at endline.

Across all household types, more than 82 percent of households use an improved water source and more than 96 percent of use solid cooking fuel at endline (Table 3.3b). Female adults-only households have notably poorer access to improved sanitation than other household types. About 77 percent of female adults-only households use an unimproved sanitation, and only 10 percent and 14 percent of these households use shared improved sanitation and non-shared improved sanitation facilities, respectively.

Table 3.3b Household dwelling characteristics, by gendered household type

Household characteristic	Percent		Percent	
	Baseline (2012)	Endline (2018)	Interim (2015)	Endline (2018)
Households using improved water source[1]				
Male and female adults	n/c-	82.45	n/a-	82.45
Female adults only	n/a-	89.62	n/a-	89.62
Male adults only	n/a-	85.05	n/a-	85.05
Children only	n/a	n/a	n/a-	n/a
Households using correct water treatment practice or technology[2]				
Male and female adults	n/a-	n/c	n/a-	n/c
Female adults only	n/a-	n/c	n/a-	n/c
Male adults only	n/a-	n/c	n/a-	n/c
Children only	n/a-	n/aa	n/a -	n/aa
Households using improved sanitation facility, non-shared[3]				
Male and female adults	n/a-	26.08	n/a-	26.08
Female adults only	n/a-	13.66	n/a-	13.66
Male adults only	n/a-	28.75	n/a-	28.75
Children only	n/a-	n/a	n/a -	n/a
Households using improved sanitation facility, shared				
Male and female adults	n/a -	12.51	n/a -	12.51
Female adults only	n/a -	9.78	n/a -	9.78
Male adults only	n/a -	9.98	n/a -	9.98
Children only	n/a -	n/a	n/a -	n/a
Households using an unimproved sanitation facility[4]				
Male and female adults	n/a -	61.34	n/a -	61.34
Female adults only	n/a -	76.57	n/a -	76.57
Male adults only	n/a -	61.27	n/a -	61.27

Children only	n/a -	n/a	n/a -	n/a
Households practicing open defecation[5]				
Male and female adults	n/a-	16.07	n/a-	16.07
Female adults only	n/a-	25.07	n/a-	25.07
Male adults only	n/a-	20.97	n/a-	20.97
Children only	n/a-	n/a	n/a -	n/a
Households using solid cooking fuels[6]				
Male and female adults	n/a -	99.52	n/a-	99.52
Female adults only	n/a -	99.23	n/a-	99.23
Male adults only	n/a -	96.43	n/a-	96.43
Children only	n/a -	n/a	n/a -	n/a
Households with access to electricity				
Male and female adults	n/a -	0.48	n/a -	0.48
Female adults only	n/a -	0.76	n/a -	0.76
Male adults only	n/a -	3.57	n/a -	3.57
Children only	n/a -	n/a	n/a -	n/a

Source: Zambia Feed the Future ZOI Survey, 2012–2013; Zambia Feed the Future ZOI Survey, 2018–2019
n/a Not applicable – no child headed households recorded in the endline survey/ data not available
n/c Information not collected

[1] 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.

[2] 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.

[3] 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).

[4] 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).

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

[6] 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

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

In Zambia, primary education consists of grades 1 to 7. Children start their primary education at an average age of 7. Tables 3.4a and 3.4b reveal that only 35 percent of children between 5 and 9 years of age are attending school. When disaggregated by gender, about 38 percent of all females and 32 percent of the males between 5 to 9 years are attending school. Across all relevant age groups and sex, less than 50 percent of individuals in the ZOI have attained a primary level of education.

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

Age group (years)	Percent		Female to male ratio	
	Attending school[1]	Attained a primary level of education[2]	Attending school[1]	Attained a primary level of education[2]
5-9	35.12	n/a[1]	1.21	n/a[1]
10-14	59.50	2.24	1.23	0.80
15-19	33.52	29.25	0.77	1.20
20-24	11.21	37.44	0.57	1.00
25-29	n/a[2]	46.57	n/a[2]	0.70
30-34	n/a[2]	37.32	n/a[2]	0.50
35-54	n/a[2]	31.13	n/a[2]	0.50
55+	n/a[2]	21.81	n/a[2]	0.30

Source: Zambia Feed the Future ZOI Survey, 2018-2019

n/a = not applicable
[1] Estimates include only household members who are 5-24 years old.
[2] Estimates include only household members who are 5 years or older.

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

Age group (years)	Female			Male		
	Attending school[1]	Attained primary level of education[2]	n	Attending school[1]	Attained primary level of education[2]	n
5-9	38.43	n/a[1]	972	31.82	n/a[1]	971
10-14	65.51	2.00	911	53.41	2.49	924
15-19	28.90	31.84	664	37.42	27.07	811
20-24	8.24	36.71	597	14.44	38.23	556
25-29	n/a[2]	37.91	309	n/a[2]	54.57	314
30-34	n/a[2]	25.33	280	n/a[2]	50.47	255
35-54	n/a[2]	20.49	704	n/a[2]	42.13	673
55+	n/a[2]	9.80	416	n/a[2]	38.50	300

Source: Zambia Feed the Future ZOI Survey, 2018–2019
n/a = data not available
[1] Estimates include only household members who are 5-24 years old.
[2] Estimates include only household members who are 5 years or older.

Table 3.5 shows school attendance, educational attainment, and literacy in the endline ZOI Survey. No corresponding estimates were available from the baseline and interim reports to make the comparison of school attendance, educational attainment, and literacy between the FTF phase one baseline, interim and endline ZOI Surveys.

Table 3. 5 School attendance, educational attainment, and literacy in the Feed the Future phase one endline ZOI Survey

Individual characteristic	Estimate Endline (2018)
Currently attending school[1]	
All household members	24.59
Male	24.42
Female	24.76
Highest educational attainment[2]	
No education	23.46
Some primary education	52.79
Completed primary education	9.30
Some secondary education	11.10
Completed secondary education or higher	3.36
Literate[3]	
All household members	36.27
Male	40.11
Female	32.47

Source: Zambia Feed the Future ZOI Survey, 2018–2019

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

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

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

4. HOUSEHOLD ECONOMIC STATUS

This chapter includes a background discussion of monetary poverty in Zambia, including the logic of the Living Standard Measurement Survey (LSMS)[12] and consumption expenditures methodology. Appendix A2.2 provides an overview of the methodology for calculating the Feed the Future phase one 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 methodology, which is also used in the LCMS in Zambia. The expenditure module measured households' consumption of various food and non-food items (based on seven days to one-year recall periods, depending on frequency of use) to infer household income and well-being. Individuals' daily per capita expenditures were then derived by dividing total household expenditures by the number of household members and the number of days in the reference period. 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 Nobel Laureate Angus Deaton, expenditure data are less prone to error, are easier to recall, and are more stable over time than income data.[13]

Despite posting an impressive growth in GDP averaging 5.9 percent per annum over the last two decades, poverty remains high in Zambia. As of 2015, slightly more than half of Zambians (54.4 percent) were poor based on a national poverty line of Zambian kwacha (ZMW) 214. 3 per adult equivalent per month (LCMS, 2015). Poverty was higher in rural areas at 76.6 percent compared to 23.4 percent in urban areas (LCMS, 2015).[14] About 70 percent of the population in the Eastern Province, which includes the five districts of the ZOI were considered poor in 2015.

4.1 Daily per capita consumption expenditures

Table 4.1a presents daily per capita expenditures, the Feed the Future indicator that measures average daily expenditures within the ZOI per person in 2010 USD after adjusting for 2005 purchasing power parity (PPP). Daily per capita consumption expenditures serve as a proxy for income.

Table 4.1a includes the mean per capita expenditures, distributional information, and the poorest quintile's share of consumption. The percentiles are shown to provide information on the distribution of expenditures. As is typical of expenditure and income data, these estimates are positively skewed, with the majority of the population consuming/spending very little, and a small portion consuming much more. The mean, therefore, is a volatile summary statistic because it is affected by these outliers that

[12] 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.

[13] Deaton, A. 2018. The Analysis of Household Surveys: A microeconomic approach to development policy. Reissue edition with a new preface, Washington DC: The World Bank.

[14] According the midline report, the national poverty line of ZMW 214. 3 per adult equivalent per month is equivalent to USD 0.81 per person per day at 2005 PPP (Feed the Future FEEDBACK, 2016)

consume much more. A more robust summary statistic is the median. Estimates in Table 17 are shown for all households as well as disaggregated by household characteristics, including gendered household type, household size, and household educational attainment.

Table 4.1a Daily per capita consumption expenditures by household characteristic (in 2010 USD at 2005 PPP1[1]) in the P1-ZOI

Characteristic	Estimate (weighted) (constant 2010 USD at 2005 PPP)						
	Mean	Percentile					n
		10th	25th	50th	75th	90th	
All households	**0.91**	**0.36**	**0.51**	**0.76**	**1.11**	**1.57**	**1880**
Gendered household type							
Male and female adults	0.85	0.37	0.50	0.74	1.06	1.44	1546
Female adults only	0.98	0.34	0.51	0.77	1.23	1.82	267
Male adults only	1.86	0.54	0.90	1.43	2.40	3.44	67
Household size							
Small (1-5 members)	1.05	0.42	0.59	0.88	1.29	1.80	1081
Medium (6-10 members)	0.72	0.32	0.44	0.65	0.91	1.20	736
Large (11+ members)	0.58	0.27	0.36	0.49	0.78	1.16	63
Household educational attainment							
No education	0.84	0.25	0.39	0.63	0.98	1.42	85
Less than primary	0.81	0.32	0.45	0.67	0.99	1.47	721
Primary	0.88	0.39	0.54	0.80	1.10	1.44	882
Secondary or more	1.40	0.49	0.66	1.03	1.66	2.53	192

Source: Zambia Feed the Future ZOI Survey, 2018–2019

[1] Daily per capita consumption expenditures measured in [local currency] 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 https://data.worldbank.org/indicator/PA.NUS.PPP?locations=ZM. We used the formula: [(2005 CPI LCU] / Oct/Nov 2018 CPI LCU) * 1 / (2005 PPP LCU)] * [(2005 CPI USD / 2010 CPI USD)] where 2005 PPP LCU = 2.830, Oct/Nov 2018 CPI LCU = 198.2045 for 2018 (this an average for the survey months in October and November 2018), 2005 CPI LCU = 100, 2010 CPI USD = 111.65, and 2005 CPI USD = 100.00. The conversion factor was 0.085.

Average daily per capita consumption expenditures in the ZOI are estimated at USD 0.91 in constant 2010 USD. Median daily per capita consumption expenditures are estimated at USD 0.76 in constant 2010 USD, indicating that 50 percent of all individuals in the P1-ZOI had daily per capita consumption expenditures less than and greater than USD 0.76. Male adults-only households had higher average per capita daily expenditure at USD 1.86 compared to USD 0.98 and USD 0.85 for female adults-only and combined male and female adult households, respectively. As expected, consumption expenditure is inversely related with household size. Smaller households had a higher per capita expenditure, averaging USD 1.05 compared to USD 0.72 and USD 0.58 for medium and large households, respectively. Households with secondary or higher level of education spent more than households with lower educational attainment.

Table 4.1b compares average daily per capita expenditures between the baseline and endline, and between interim and endline. The average daily per capita expenditure increased from USD 0.84 at baseline to USD 1.01 at interim, and declined to USD 0.91 at endline. We cannot tell whether the differences in per capita consumption expenditure between baseline and endline, and between interim and endline are statistically significant given overlapping confidence intervals.

While Tables 4.1a and 4.1b show declines in average per capita daily expenditure between interim and endline and a slight increase from baseline, the median per capita expenditure of USD 0.76 at the endline is higher than a median value of USD 0.63 at the interim. A closer look at the distribution of per capita daily expenditure shows that it was higher for the lower 50 percent of the population in the endline than it was in the interim, but expenditure declined for the top 25 percent across the two ZOI surveys.

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 endline ZOI

Indicator	Baseline (2012)	95% confidence interval	Interim (2015)	95% confidence interval	Endline (2018)	95% confidence interval
Daily per capita consumption expenditures	0.84	0.76 – 0.93	1.01	0.89 – 1.14	0.91	0.88 - 1.93

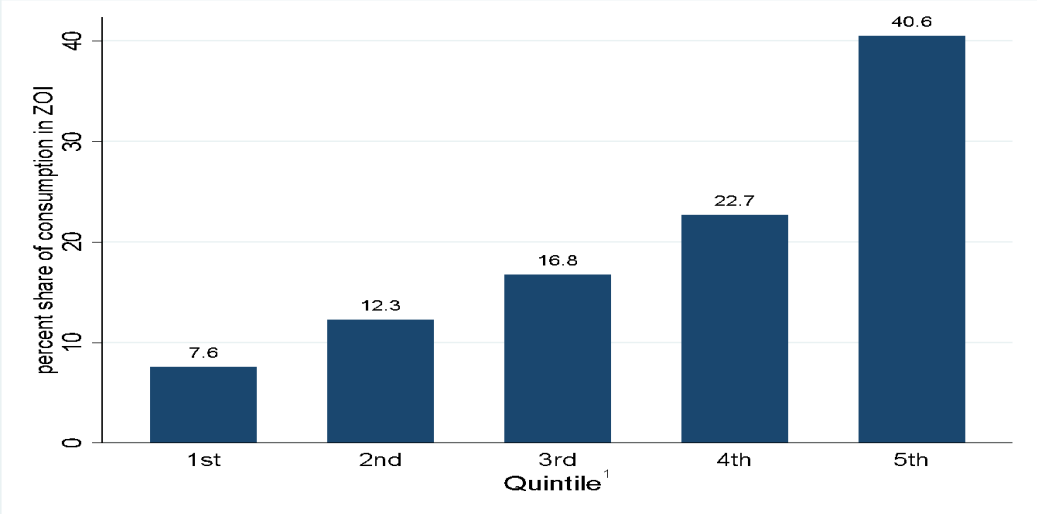
Source: Zambia Feed the Future ZOI Survey, 2012–2013; Zambia Feed the Future ZOI Survey, 2015; Zambia Feed the Future ZOI Survey, 2018–2019

[1] Daily per capita consumption expenditures measured in [local currency] 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: [(2005 CPI LCU] / Oct/Nov 2018 CPI LCU) * 1 / (2005 PPP LCU)] * [(2005 CPI USD / 2010 CPI USD)] where 2005 PPP LCU = 2.830, Oct/Nov 2018 CPI LCU = 198.2045 for 2018 (this an average for the survey months in October and November 2018), 2005 CPI LCU = 100, 2010 CPI USD = 111.65, and 2005 CPI USD = 100.00. The conversion factor was 0.085.

Non-overlapping 95% confidence intervals between baseline and endline or midline, midline and endline statistically significant differences

Figure 4.1 shows the share of total consumption per quintile in the P1-ZOI. The bottom 20 percent of the population contributed 7.6 percent to total consumption expenditure, while the richest 20 percent contributed about 41 percent to total consumption expenditure in the ZOI. Compared to the interim, Figure 4.1 shows a marked increase in consumption expenditure of the bottom 20 percent who only contributed 3 percent to total expenditure at interim, and a decline in expenditure for the top 20 percent who contributed 58.8 percent at interim. These findings suggest that consumption expenditure was becoming more equitable at endline than it was at interim.

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



[1]The poorest quintile is determined as the poorest fifth of the population. 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.

4.2 Prevalence and depth of poverty in the P1-ZOI

The prevalence of poverty, sometimes called the poverty headcount ratio, is measured by determining the percentage of individuals living below a poverty threshold.[15] Estimates of poverty prevalence are sensitive to the poverty thresholds used to identify the poor. A standardized poverty threshold of USD 1.25 per person per day in adjusted 2005 USD was used to track global changes in poverty across countries during the first phase of Feed the Future.[16] The USD 1.25 threshold is in effect the extreme poverty threshold and represents the poverty line typical of the world's poorest countries.[17] 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. The depth of poverty, often called the poverty gap, is a useful poverty estimate because it captures the extremity of poverty. This measure indicates the average gap between consumption expenditure levels 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.

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

[16] Adjustments are made according to PPP conversions. The World Bank establishes these conversions to allow for comparisons of how much an individual can buy with a certain amount of money in different countries. The USD1.25 in 2005 PPP means that USD1.25 could buy the same amount of goods in another country as USD1.25 could in the United States in 2005.

[17] World Bank. 2015. Poverty & Equality Data FAQs. Available at: http://go.worldbank.org/PYLADRLUN0.

4.2.1 The USD1.25 poverty threshold

Table 4.2a presents poverty estimates at the USD 1.25 per person per day (2005 PPP) threshold. The prevalence of poverty and depth of poverty at the USD 1.25 per person per day poverty line are Feed the Future phase one 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. About three-quarters (75.3 percent) of households in the P1-ZOI live below the USD 1.25 poverty threshold. Poverty prevalence is lowest in male-adults only households and in smaller households. As expected, the prevalence of poverty declines with average educational attainment of the household.

Depth of poverty. The depth of poverty in the P1-ZOI is 32 percent, which indicates that the average gap between consumption levels of the population and the poverty line is USD 0.40.[18] 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 1.75 million, a poverty threshold of USD 1.25 per person per day (2005 PPP), and a poverty gap of 32 percent, USD 699,533 per day would need to be transferred to the poor to bring their income or expenditures up to the poverty threshold.[19] The depth of poverty is lower in male-adults only households than in households with female adults only or households with both male and female adults. While the depth of poverty appears to increase with household size, it declines with educational attainment.

Average consumption shortfall of the poor. The average poor person within the P1-ZOI lives at 51.5 percent of the poverty line, or 48.5 percent below the poverty line. The average value of consumption of a poor person is USD 0.61 (2005 PPP) per day. This implies that, on average, the poor consume USD 0.64 (2005 PPP) less than the poverty threshold of USD1.25. The consumption shortfall is higher among larger households and those with lower educational attainment.

[18] The average gap between consumption levels of the population and the poverty line is calculated as follows: (32 ÷ 100) * 1.25 = USD 0.4

[19] The average daily cost of raising the income or consumption expenditures of the poor up to the poverty threshold is calculated as follows: [(32 ÷ 100) * USD 1.25/day] * 1,748,832 = USD 699,532.8/day. The mean depth of poverty in the ZOI is 32 percent; the poverty threshold is USD 1.25/day, and the population is 1.75 million.

Table 4.2a Poverty at the USD1.25 (2005 PPP) per person per day threshold in the P1-ZOI

Characteristic	Prevalence of poverty[1]		Depth of poverty[2]		Average consumption shortfall of the poor[3]		
	Percent	n[4]	Percent of poverty line	n[4]	USD (2005 PPP)	Percent of poverty line	n[4]
All households	**75.34**	**1880**	**32.01**	**1880**	**0.61**	**48.49**	**1419**
Gendered household type							
Male and female adults	77.76	1546	33.02	1546	0.61	48.46	1205
Female adults only	70.72	267	31.16	267	0.62	49.90	190
Male adults only	38.93	67	12.81	67	^	^	24
Children only (no adults)	-	-	-	-	-	-	0
Household size							
Small (1–5 members)	66.05	1081	25.70	1081	0.57	45.28	715
Medium (6–10 members)	87.68	736	39.73	736	0.64	51.01	647
Large (11+ members)	89.26	63	49.25	63	0.75	59.86	57
Household educational attainment							
No education	81.57	85	40.27	85	0.68	54.66	68
Less than primary	80.88	721	36.83	721	0.64	51.23	581
Primary	75.50	882	30.26	882	0.58	46.33	664
Secondary or more	53.04	192	19.63	192	0.54	43.59	106

Source: Zambia Feed the Future ZOI Survey, 2018–2019

[1] The prevalence of poverty is the percentage of individuals living below the USD 1.25 (2005 PPP) per person per day threshold. Poverty prevalence is sometimes referred to as the poverty incidence or poverty headcount ratio.

[2] The depth of poverty, or poverty gap, is the average consumption shortfall multiplied by the prevalence of poverty.

[3] 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.

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

^ Results not statistically valid, n<30

Table 4.2b compares the poverty estimates at the USD 1.25 per person per day (2005 PPP) threshold between the phase one baseline and endline, and between interim and endline ZOI Surveys. Poverty significantly reduced in the ZOI by 12.66 percentage points between baseline and endline. The depth of poverty also reduced significantly between baseline and endline by 36 percent. This is a big reduction in the depth of poverty considering that the prevalence of poverty only reduced by about 13 percentage points over the same period.

Table 4.2b Comparison of poverty at the USD1.25 (2005 PPP) per person per day threshold between the Feed the Future phase one baseline and endline ZOI Surveys

Indicator	Baseline (2012)	95% confidence interval	Interim (2015)	95% confidence interval	Endline (2018)	95% confidence interval
Prevalence of poverty[2]	88.00 [ab]	85.4 – 90.6	80.90 [a]	77.1 – 84.8	75.34[b]	73.39 - 77.29
Depth of poverty[3]	50.40 [a]	46.9 – 53.8	47.30 [b]	43.20 – 51.30	32.01 [ab]	30.82 - 33.20

Source: Zambia Feed the Future ZOI Survey, 2012-2013; Zambia Feed the Future ZOI Survey 2015; Zambia Feed the Future ZOI Survey, 2018–2019

[1] Confidence intervals (CIs) demonstrate the reliability of estimated values.

[a-b] Subgroups with the same superscript have non-overlapping 95% confidence intervals, and are statistically different. Comparisons are within rows.

[2] The prevalence of poverty is the percentage of individuals living below the USD 1.25 (2005 PPP) per person per day threshold. 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 multiplied by the prevalence of poverty.

As expected, the prevalence of poverty and depth of poverty at the $1.90 2011 PPP were much higher at 86.8% and 42.4 percent, respectively,– see Appendix 3.

4.2.3 The national poverty threshold

Table 4.3 presents the endline poverty estimates based on the national poverty threshold for Zambia. Similar to above, this table presents poverty estimates for all households in the P1-ZOI, disaggregated by gendered household type, household size, and household educational attainment.

The national poverty line of ZMW 214.3 per adult equivalent per month used in the 2015 Living Conditions Monitoring Survey (LCMS 2015) is used to compute poverty in Table 4.3. For this analysis, we used the national poverty line converted to the 2005 PPP per capita The LCMS is the official Zambian government survey that estimates national poverty.

Nearly 47 percent of households in the ZOI live below the national poverty line. The national poverty line identifies a lower prevalence of poverty compared to the internationally accepted USD 1.25 extreme poverty threshold. This is not surprising. According to the Feed the Future interim report, the national poverty threshold of ZMW 214.3 per adult equivalent per month translates to about USD 0.81 per capita in 2005 PPP, which is 35 percent lower than international extreme poverty line of USD 1.25. The prevalence of poverty follows similar trends as in Table 4.2a, where male-adults only households had the lowest prevalence of poverty than female adults only or combined female- and male- adults households. While large households experience higher rates of poverty, prevalence decreases with higher education attainment levels.

Depth of poverty. The depth of poverty based on the national poverty is lower at 19.1 percent, compared to 32.1 percent based on the USD 1.25 poverty line. As in Table 4.2b, the depth of poverty increases with household size but reduces with level of education attainment. Male-adults only households have lower depths of poverty than female-adults only and male- and female- adult households.

Average consumption shortfall of the poor. The poor on average live at 59.8 percent of the national poverty line or at 40.2 percent below the poverty line, with an average consumption shortfall of USD 0.33 (2005 PPP).``

Table 4.3 Poverty at the national threshold of ZMW 214.31 in the P1-ZOI

	Prevalence of poverty[2]		Depth of poverty[3]		Average consumption shortfall of the poor[4]		
Characteristic	Percent	n	Percent of poverty line	n	USD (2005 PPP)	Percent of poverty line	n[5]
All households	**46.55**	**1880**	**19.10**	**1880**	**0.33**	**40.18**	**883**
Gendered household type							
Male and female adults	48.17	1546	19.66	1546	0.32	39.99	751
Female adults only	45.73	267	19.24	267	0.33	41.15	122
Male adults only	13.77	67	6.18	67	^	^	10
Children only (no adults)	n/a	0	n/a	0	n/a	n/a	0
Household size							
Small (1–5 members)	36.73	1081	14.19	1081	0.30	37.48	399
Medium (6–10 members)	58.68	736	24.87	736	0.34	41.78	439
Large (11+ members)	71.91	63	35.15	63	0.39	48.35	45
Household educational attainment							
No education	56.10	85	27.67	85	0.39	48.57	48
Less than primary	53.84	721	23.02	721	0.34	41.88	386
Primary	43.67	882	17.17	882	0.31	38.46	386
Secondary or more	30.03	192	10.47	192	0.28	34.26	63

Source: Zambia Feed the Future ZOI Survey, 2018–2019

[1] The national poverty line of ZMW 214.3 per adult equivalent per month from the 2015 Living Conditions Monitoring Survey (LCMS 2015) is used to compute national poverty here. According the FTF interim report, this translates to about $0.81 per person per day at 2005 PPP.

[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 multiplied by the prevalence of poverty.

[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, disaggregates' sample sizes may not total to the aggregated sample size

^ Results not statistically valid, n<30

n/a not applicable

4.2.4 The national extreme poverty threshold

Table 4.4 presents poverty estimates based on the extreme poverty threshold. Similar to prior poverty tables, this table presents poverty estimates for all households in the P1-ZOI, disaggregated by characteristics, including gendered household type, household size, and household educational attainment.

Poverty prevalence. Slightly over a quarter (25.7 percent) of households in the ZOI live below the extreme national poverty rate of ZMW 151.9 per adult equivalent per day or USD 0.57 (2005 PPP) per person per day. The national extreme poverty used here was adopted from the LCMS in Zambia. As with the other poverty tables, the prevalence of poverty varies with household type, household size and educational attainment. Overall, the poverty incidence was lowest among male-adults only households. Smaller households were less poor as well as households with higher educational attainment.

Table 4.4 Poverty at the national extreme threshold of ZMW151.9[1] in the P1-ZOI

Characteristic	Prevalence of poverty[2]		Depth of poverty[3]		Average consumption shortfall of the poor[4]		
	Percent	n[5]	Percent of poverty line	n[5]	USD (2005 PPP)	Percent of poverty line	n[5]
All households	**25.66**	**1880**	**9.03**	**1880**	**0.19**	**34.15**	**480**
Gendered household type							
Male and female adults	26.60	1546	9.19	1546	0.19	33.45	415
Female adults only	24.65	267	9.76	267	0.22	39.01	60
Male adults only	8.67	67	2.84	67	^	^	5
Household size							
Small (1–5 members)	18.23	1081	6.01	1081	0.18	31.85	191
Medium (6–10 members)	33.84	736	12.46	736	0.20	35.79	252
Large (11+ members)	56.48	63	20.29	63	0.20	35.35	37
Household educational attainment							
No education	40.43	85	16.46	85	0.23	39.85	34
Less than primary	31.53	721	11.49	721	0.20	35.52	223
Primary	22.48	882	7.62	882	0.19	32.66	193
Secondary or more	13.28	192	3.37	192	0.15	27.04	30

Source: Zambia Feed the Future ZOI Survey, 2018–2019LCMS 2015.

[1] The extreme national poverty line of ZMW 151.9 per adult equivalent per month from the 2015 Living Conditions Monitoring Survey (LCMS 2015) is used to compute national poverty here. According the FTF interim report, this translates to about $0.57 per person per day at 2005 PPP.

[2] The poverty prevalence is the percentage of individuals living below the national extreme 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 multiplied by the prevalence of poverty.

[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, disaggregates' sample sizes may not total to the aggregated sample size.

^ Results not statistically valid, n<30

Depth of poverty. The depth of poverty follows similar patterns. Compared to the USD 1.25 threshold, the depth of poverty at the extreme national poverty line is only 9.0 percent. The depth of poverty is highest among female adult only households and increases with household size but decreases with educational attainment.

Average consumption shortfall of the poor. The poor on average live at 65.8 percent of the extreme national poverty line or at 34.2 percent below the poverty, with an average consumption shortfall of USD 0.19 (2005 PPP).

5. HUNGER AND DIETARY INTAKE

This chapter presents findings related to hunger and women's and young children's dietary intake.

5.1 Household hunger

The household hunger scale (HHS) is used to calculate the prevalence of households in the Zambia 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, such as right before the harvest or during the dry season.[20,21]

The hungry season in Zambia occurs between the months of November to March.[22] Data for the HHS were collected from 10th October to 13th November, at the beginning of the hunger season. Table 5.1a presents estimates of household hunger for all households in the P1-ZOI, as well as by gendered household type, household size, and household educational attainment.

Approximately a fifth of the households in the P1-ZOI experience moderate or severe hunger. Overall, about 19.62 percent of all households report experiencing moderate hunger. Among gendered household types, female adult only households had the highest prevalence of moderate hunger at 28.68 percent. The differences in the prevalence of moderate hunger barely differs by household size even if large households with more than 11 members report the highest prevalence at 21.67 percent. Households with no education attainment reported the highest prevalence of both moderate and severe hunger at 35.62 percent and 9.37 percent, respectively.

Table 5.1a Prevalence of household hunger, by severity, in the P1-ZOI

Characteristic	Percent			n
	Little to no hunger	Moderate hunger	Severe hunger	
All households	**78.16**	**19.62**	**2.21**	**1880**
Gendered household type				
Male and female adults	80.44	18.11	1.46	1546
Female adults only	66.64	28.68	4.69	267

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

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

[22] FEWSNET 2016

Male adults only	70.75	19.50	9.75	67
Household size				
Small (1–5 members)	77.25	19.76	2.99	1081
Medium (6–10 members)	79.47	19.25	1.27	736
Large (11+ members)	78.33	21.67	0.00	63
Household educational attainment				
No education	55.01	35.62	9.37	85
Less than primary	69.32	27.04	3.64	721
Primary	84.32	14.83	0.85	882
Secondary or more	91.25	8.36	0.40	192

Source: Zambia Feed the Future ZOI Survey, 2018–2019

Table 5.1b compares household hunger between the phase one baseline and endline ZOI Surveys. The prevalence of moderate to severe hunger increased by 8.70 percentage points between baseline and interim before reducing by 10 percentage points between interim and endline. The increase in hunger at the interim can be attributed to the poor and erratic rainfall in Zambia, particularly in the Eastern and Southern Province during the 2014/2015 agricultural season.

Table 5.1b Comparison of household hunger between the Feed the Future phase one baseline and endline ZOI Surveys

	Baseline (2012)	95% confidence interval	Interim (2015)	95% confidence interval	Endline (2018)	95% confidence interval
Household hunger (moderate or severe)	23.20 [a]	20.0 – 26.4	31.90 [ab]	26.70 – 37.70	21.84 [b]	19.97 - 23.71

Source: Zambia Feed the Future ZOI Survey, 2012-2013; Zambia Feed the Future ZOI Survey 2015; Zambia Feed the Future ZOI Survey, 2018–2019

[1] Confidence intervals (CIs) demonstrate the reliability of estimated values.

[a-b] Subgroups with the same superscript have non-overlapping 95% confidence intervals, and are statistically different. Comparisons are within rows.

[2] The prevalence of household hunger is the percentage of households that experienced moderate or severe hunger during the 12 months preceding the survey, based on the Household Hunger Scale.

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 ZOI endline survey, two dietary diversity indicators for women are calculated: The Mean Women's Dietary Diversity Score (WDDS) and Minimum Dietary Diversity for Women (MDD-W).

Women's mean 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 a 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.

Overall, women consumed an average of 4.37 food groups in the previous 24 hours. Dietary diversity does not show much variability by age of the woman. Women 15-19 years of age and 20 -24 years of age had the highest score at 4.44 food groups, but this is barely different from a mean of 4.37.Differences in dietary diversity score based on educational attainment type are mixed. Women with little primary education have the highest levels of dietary diversity when compared to all other levels of education attainment.

On the other hand, WDDS appears to increase with household size. Smaller households with 1 to 5 members had a WDDS of 4.29, while households with 11 members and above have a score of 4.58. WDDS does not appear to differ much by household hunger.

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

Characteristic	Mean	Median	n[1]
All women of reproductive age	**4.37**	**4**	**1913**
Age			
15-19	4.44	4	433
20-24	4.44	4	397
25-29	4.31	4	289
30-34	4.32	4	272
35-39	4.25	4	234
40-44	4.37	4	156
45-49	4.32	4	132
Educational attainment			
No education	4.20	4	95
Less than primary	4.43	4	729
Primary	4.35	4	884
Secondary or more	4.33	4	205
Gendered household type			

Male and female adults	4.37	4	1553
Female adults only	4.40	4	282
Male adults only	4.14	4	78
Household size			
Small (1–5 members)	4.29	4	1086
Medium (6–10 members)	4.45	4	771
Large (11+ members)	4.58	4	56
Household hunger			
Little to no hunger	4.37	4	1493
Moderate or severe hunger	4.37	4	420

Source: Zambia Feed the Future ZOI Survey, 2018–2019

[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, disaggregates' sample sizes may not total to the aggregated 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.[23] 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 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 gendered household type, household size, and household hunger.

As shown in Table 5.3, 57 percent of the women in the ZOI achieved the MDD-W threshold (five food groups). When stratified by age, the highest percentage of women achieving the MDD-W threshold was among women 15 to19 years of age and those 40 to 44 years of age. Interestingly, a larger proportion of women with a primary education achieve a minimum dietary diversity threshold compared to women with a secondary school education. (However, the difference in proportions is minimal and not likely to be statistically significant.) A larger proportion (59 percent) of women from households with male and female adults achieve the minimum dietary diversity threshold than women from female adults only (56 percent), although the difference in proportions is small. About 64 percent of women in large households (11+ members) achieve the minimum dietary diversity threshold compared to 59 percent of women from medium-sized households (6-10 members). More than half (about 57 percent) of the women in households experiencing little to no hunger and (56 percent) of households experiencing moderate to severe hunger achieved the minimum dietary diversity.

[23] The differences between the nine food groups used for the WDDS (Table 6.2), the standard FTFMS indicator, and the 10 food groups used for the new MDD-W measure (Table 6.3) 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.

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

Characteristic	Percent	n[1]
All women of reproductive age	56.50	1,913
Age		
15-19	60.43	433
20-24	58.99	397
25-29	55.27	289
30-34	53.60	272
35-39	47.73	234
40-44	59.29	156
45-49	57.48	132
Educational attainment		
No education	48.75	95
Less than primary	57.40	729
Primary	56.94	884
Secondary or more	54.81	205
Gendered household type		
Male and female adults	58.62	1553
Female adults only	55.66	282
Male adults only	56.17	78
Household size		
Small (1–5 members)	54.67	1086
Medium (6–10 members)	58.49	771
Large (11+ members)	64.03	56
Household hunger		
Little to no hunger	56.61	1493
Moderate or severe hunger	56.11	420

Source: Zambia Feed the Future ZOI Survey, 2018–2019

[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, disaggregates' sample sizes may not total to the aggregated sample size.

[2] male adults only households had female of reproductive aged 15 – 17 years.

Table 5.4 shows the percentages of women aged 15-49 years who consumed each of the 10 food groups by dietary diversity achievement status. The percentage of all women who consumed each of the 10 food groups is shown under 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.

Among the women who achieved a minimum dietary diversity, nearly all of them (98.7 percent) consume grains, roots or tubers. Other widely consumed food groups (by more than 70 percent of the women) include other vegetables (other than Vitamin A-rich vegetables) (96.0percent) and Nuts and

seeds (76.8 percent). Meat and meat products are consumed by almost two thirds (56.6 percent) of the women. The least consumed food groups are legume and beans, dairy products and eggs.

On the other hand, among the women who did not achieve minimum dietary diversity, only three food groups are widely consumed. These were cereals, roots or tubers (by 98 percent of the women)and other vegetables which were consumed by 81 percent of the women. Legumes and beans were consumed by 17.9 percent of the women in this category. Less than half of the women consumed meat and meat products. The rest of the food groups are consumed by a very small proportion of the women. Eggs and dairy products are the least consumed food groups by less than 20 percent.

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

	Percent		
Food group	Achieved minimum dietary diversity	Did not achieve minimum dietary diversity	Overall
Grains, roots, and tubers	98.79	97.73	98.33
Legumes and beans	39.72	17.87	30.22
Nuts and seeds	76.80	41.64	61.51
Dairy products	12.06	1.634	7.525
Meat and organ meats	56.62	22.96	41.98
Eggs	23.05	3.876	14.71
Vitamin A-rich dark green leafy vegetables	76.12	50.12	64.81
Other Vitamin A-rich vegetables and fruits	69.46	6.929	42.26
Other fruits	65.95	5.285	39.56
Other vegetables	95.97	81.34	89.60
n	**1,078**	**835**	**1,913**

Source: Zambia Feed the Future ZOI Survey, 2018–2019

Table 5.5 compares the WDDS and MDD-W indicators between the Feed the Future phase one baseline and endline ZOI Surveys. In comparison to the 2012 Zambia ZOI baseline survey, there has been marginal improvement in WDDS from an average of 4.00 to an average of 4.37 food groups. This change is statistically significant. However, compared to the interim survey of 2015, WDDS has reduced from 4.84 to 4.37 food groups, a statistically significant decrease.

Table 5.5 Comparison of women's dietary diversity between the Feed the Future phase one baseline and endline ZOI Surveys

Indicator	Baseline (2012)	95% confidence interval	Interim (2015)	95% confidence interval	Endline (2018)	95% confidence interval
Women's mean dietary diversity (mean number of food groups consumed)	4.01 [a]	3.90 – 4.12	4.84 [a]	4.65 – 5.03	4.37 [a]	4.30 - 4.43

Source: Zambia Feed the Future ZOI Survey, 2012–2013; Zambia Feed the Future ZOI Survey, 2018–2019

[1] Confidence intervals (CIs) demonstrate the reliability of estimated values.

[a] Subgroups with the same superscript have non-overlapping 95% confidence intervals, and are statistically different. Comparisons are within rows.

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 from the self-identified primary caregiver and not strictly for the biological mother, although it is often the same person.

In the Zambia ZOI, slightly more than half (51.9 percent) of the children are exclusively breastfed. Disaggregating by the sex of the child, the prevalence of exclusive breast feeding among females is higher at 56 percent compared to 48 percent among males. In relation to education levels of the caregivers, the data shows slightly higher prevalence (52.49 percent) among caregivers with a primary education compared to those with less than a primary education (50.71 percent).

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

Characteristic	Percent	n
All children ages 0-5 months	**51.90**	**157**
Child gender		
Male	48.16	82
Female	56.05	75
Caregiver's educational attainment[2]		
No education	^	1
Less than primary	50.71	70
Primary	52.49	77
Secondary or more	^	9

Source: Zambia Feed the Future ZOI Survey, 2018–2019
^ Results not statistically reliable, n<30
[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

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 include sex, age, and educational attainment. Household characteristics include gendered household type, household size, and household hunger.

As shown in Table 5.7, over one third (34.92 percent) of the children receive a minimum acceptable diet. When disaggregated by sex of the child, the data shows that a larger proportion of male children (35.86 percent) receive a minimum acceptable diet than female children (34.04 percent). Receiving a MAD appears to increase with the age of the child: a larger proportion of children 12-17 and 18-23 months consume a minimum acceptable diet than younger children (6-11 months). A higher proportion (36.48 percent) of children receiving a MAD were from households experiencing little to no hunger compared to 33.04 percent of children in households experiencing moderate or severe hunger.

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

Characteristic	Percent	n[1]
All children ages 6-23 months	**34.92**	**516**
Child gender		
Male	35.86	255
Female	34.04	261
Child age		
6-11 months	30.42	167
12-17 months	32.14	175
18-23 months	41.95	174
Caregiver's educational attainment[2]		
No education	^	24
Less than primary	33.56	205
Primary	36.48	232
Secondary or more	29.18	55
Gendered household type		
Male and female adults	36.11	430
Female adults only	30.51	73
Male adults only	^	13
Household size		
Small (1–5 members)	33.04	277
Medium (6–10 members)	36.96	224
Large (11+ members)	^	15
Household hunger		
Little to no hunger	35.54	407
Moderate or severe hunger	32.66	109

Source: Zambia Feed the Future ZOI Survey, 2018–2019

^ 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, disaggregates' sample sizes may not total to the aggregated 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 minimum acceptable diet indicator. Estimates are shown for all children, as well as by child's age, and are presented for breastfed children.

It should be noted there is a small number of observations for non-breastfed children, hence only results from breastfed children are presented. In the ZOI, about 60 percent of the breastfed children achieve a minimum meal frequency, while only one third achieve a minimum dietary diversity. Unlike achieving a minimum meal frequency which shows a non-linear association with age of the child, achieving a minimum dietary diversity increases with increase in the child's age. While only a third of the younger

children (6-11 months old) achieve a minimum dietary diversity, it is about 50 percent for the older children between 18-23 months. The most commonly consumed foods are grains, roots and tubers (consumed by 96 percent of the breastfed children); followed by other fruits and vegetables (other than Vitamin A-rich fruits and vegetables) which are consumed by almost 80 percent of the children (Table 5.8). Legumes and Vitamin A-rich fruits and vegetables are also widely consumed by more than two-thirds of the children. The least consumed food groups are dairy products (9 percent), eggs (12 percent) and flesh foods (34 percent).

Table 5.8 Prevalence of children 6-23 months achieving minimum feeding frequency, dietary diversity, and consuming foods each of the food groups included in the minimum acceptable diet indicator in the P1-ZOI, by breastfeeding status

	Percent			
	All children	Child age (months)		
		6-11	12-17	18-23
Breastfed children				
Achieving minimum meal frequency	60.44	64.50	50.43	67.79
Achieving minimum dietary diversity	37.46	30.42	33.26	50.28
Consuming:				
Grains, roots, and tubers	95.95	97.18	95.18	95.49
Legumes and nuts	70.85	61.13	69.81	82.90
Dairy products	9.42	10.92	10.38	6.60
Flesh foods	34.27	23.78	43.15	35.39
Eggs	12.19	8.23	17.14	10.72
Vitamin A-rich fruits and vegetables	67.01	50.85	70.44	80.95
Other fruits and vegetables	79.33	63.99	86.47	87.95
N	**491**	**167**	**171**	**153**
Non-breastfed children				
Achieving minimum meal frequency	^	n/a	^	^
Achieving minimum milk feeding frequency	^	n/a	^	^
Achieving minimum dietary diversity	^	n/a	^	^
Consuming:				
Grains, roots, and tubers	^	n/a	^	^
Legumes and nuts	^	n/a	^	^
Dairy products	^	n/a	^	^
Flesh foods	^	n/a	^	^
Eggs	^	n/a	^	^
Vitamin A-rich fruits and vegetables	^	n/a	^	^
Other fruits and vegetables	^	n/a	^	^
N	**25**	**0**	**4**	**21**

Source: Zambia Feed the Future ZOI Survey, 2018–2019
^ Results not statistically reliable, n<30
n/a data not available

Table 5.9 compares the prevalence of exclusive breastfeeding among children 0–5 months and the prevalence of children 6-23 months receiving a minimum acceptable diet between the phase one baseline and endline ZOI Surveys. As shown in Table 5.9, the prevalence of exclusive breast feeding improved from 43.7 percent in 2015 to 51.9 percent in 2018. Similarly, consumption of a minimum acceptable diet for children significantly increased from 16.2 percent in 2012 to 34.9 percent in 2018. However, when compared to the 2015 interim survey, there has been marginal reduction in children achieving minimum acceptable diet from 35.7 percent to 34.9 percent. Similar patterns are observed by sex of the child.

Table 5.9 Comparison of children's dietary intake between the phase one baseline and endline ZOI Surveys

	Baseline (2012)	95% confidence interval	Interim (2015)	95% confidence interval	Endline (2018)	95% confidence interval
Exclusive breastfeeding children ages 0-5[1] months	**^**	**n/a**	**43.70**	26.90 – 62.10	**51.90**	44.00 - 59.80
Male	^	n/a	^	n/a	48.16	37.11 - 59.20
Female	^	n/a	^	n/a	56.05	44.55 -67.54
Minimum acceptable diet children ages 6-23[1]months	16.20 [a]	11.2 – 21.2	35.70 [ab]	26.30 – 46.30	34.92 [ac]	30.79 - 39.05
Male	14.60 [a]	8.0 – 21.2	41.20 [ab]	27.90 – 55.90	35.86 [ac]	29.93 - 41.78
Female	17.70 [a]	10.1 – 25.3	28.20	18.40 – 40.70	34.04 [a]	28.26 - 39.83

[1]Confidence intervals (CIs) demonstrate the reliability of estimated values.
[a-c] Subgroups with the same superscript have non-overlapping 95% confidence intervals, and are statistically different. Comparisons are within rows
^ Results not statistically reliable, n<30
n/a not applicable

5.3 Consumption of Targeted Nutrient-Rich Value Chain Commodities

U.S. Government-funded programming in Zambia supports nutrition-sensitive agricultural value chain[24] interventions to achieve the dual purpose of enhancing both economic and nutritional outcomes. The Feed the Future ZOI interim and endline assessments measure the degree to which respondents in the ZOI are consuming nutrient-rich commodities or products made from nutrient-rich commodities being promoted by these value chain activities.

[24] From Martin Webber and Patrick Labaste, "Building competitiveness in Africa's agriculture : a guide to value chain concepts and applications," published by The World Bank: "The term 'value chain' describes the full range of value-adding activities required to bring a product or service through the different phases of production, including procurement of raw materials and other inputs, assembly, physical transformation, acquisition of required services such as transport or cooling, and ultimately response to consumer demand (Kaplinsky and Morris (2002), "A Handbook for Value Chain Research," p. 46–47)."

There are three criteria for a food commodity to be considered a targeted nutrient-rich value chain commodities (NRVCC):

1) Increased production of the commodity must be promoted through a U.S. Government-funded value chain activity.

2) The value chain commodity must have been selected for nutrition objectives, in addition to any poverty-reduction or economic-growth related objectives.

3) The commodity must be considered nutrient rich, defined as meeting any one of the following criteria: It is bio-fortified; a legume, nut or seed; an animal-sourced food, including dairy products (milk, yogurt, cheese), eggs, organ meat, flesh foods, and other miscellaneous small animal protein (e.g. grubs, insects); a dark yellow or orange-fleshed root or tuber; or a fruit or vegetable that meets the threshold for being a "high source" of one or more micronutrients on a per 100gram basis.

This section presents the ZOI endline assessment findings on the consumption of targeted NRVCC among women aged 15-49 and children aged 6-23 months. The targeted commodities in Zambia include: groundnuts, soybeans, cowpeas, orange fleshed sweet potatoes, dark green leafy vegetables and orange maize.

5.3.1 Women's Consumption of Targeted Nutrient-Rich Value Chain Commodities

Table 5.10 presents women's consumption of targeted NRVCC. Estimates are shown for all women aged 15-49 years, as well as by women's individual and household characteristics. Women's individual characteristics include age and educational attainment. Household characteristics include gendered household type, household size, and household hunger.

Consumption of any targeted commodity by all women in the reproductive age group increased in the endline to about 70 percent from 52.4 percent recorded in the interim. Apart from local dark green vegetables which were less consumed at endline (6.49 percent) than in the interim (15.5 percent), the consumption of the rest of the nutrient-rich value chain commodities increased at endline. Disaggregating the consumption by age group of the women, the data does not show any consistent pattern by age at interim or endline. A larger proportion of younger women between 25 to 29 years old and the oldest women 40-44 years consumed more of any targeted commodity at interim. This pattern was slightly different at endline where the highest consumption of any targeted commodity was among women in the 25 to 29 and 45 to 49 age groups. Groundnuts was the most consumed commodity with 61 percent and 42 percent of all the women consuming it in the endline and the interim respectively.

Table 5.10 Women's consumption of targeted nutrient-rich value chain commodities

Characteristic	Any targeted commodity	Groundnuts	Soya beans	Pigeon Peas	Cow-peas	Orange Fleshed Sweet-Potato (OFSP)	Local Dark Green Leafy Veg (DGLV)	Orange Maize	n
INTERIM									
Total (All women 15-49)	52.4	42.1	2.6	0.9	2.6	0.5	15.5	1.3	932
Age									
15-19	58.4	48.5	3.4	0.4	3.7	0	13.8	1.7	244
20-24	42.8	31.7	0.8	0.6	2.9	0.9	14.3	1	150
25-29	60.4	42.7	6.1	3	0.6	0.1	23.5	1.8	132
30-34	50.1	41.7	2.5	0	0.1	0.2	14.2	2.4	120
35-39	44	34.8	1.5	0	2.4	2.2	13.4	0.7	114
40-44	60.8	56.5	1.1	0	4.4	0	21.5	0	91
45-49	46.9	40.5	0.3	3.4	6.2	0	9.1	0	81
ENDLINE									
Total (All women 15-49)	69.91	61.35	13.05	1.47	5.46	2.36	8.58	2.43	1913
Age									
15-19	70.98	63.09	12.47	2.10	6.44	2.46	6.49	2.24	433
20-24	70.80	60.85	14.63	0.95	3.01	1.55	7.95	2.91	397
25-29	73.76	62.44	15.46	1.85	7.00	4.16	9.67	2.41	289
30-34	67.62	62.44	10.07	2.32	5.06	1.09	10.73	1.43	272
35-39	64.83	55.83	11.54	0.85	5.40	3.30	8.35	4.01	234
40-44	67.01	60.10	10.91	0.94	5.43	3.16	7.83	1.01	156
45-49	72.85	64.02	16.68	0.00	7.19	0.50	11.75	2.61	132

Source(s): FTF ZOI Interim Survey, Zambia 2012 and FTF ENDLINE Survey, Zambia 2018.

Tables 5.11 and 5.12 show the consumption of nutrient-rich value chain by gendered household type and by education levels, respectively. At endline, the rate of consumption of any targeted commodity is higher among male and female adult households (70.6 percent) compared to the rates among the female adults only households (67.0 percent). In both the interim and the endline, the rate of consumption of groundnuts was the highest compared to other commodities among all types of households.

Consumption of the commodities according educational levels varies and there are no differences in the consumption patterns between the endline and the interim. However, larger households in both the interim and the endline consumed more nutrient-rich value chain commodities than households with fewer members. However, the endline recorded increased rates of consumption among all households compared to the interim. Households with little or no hunger consumed more of the commodities than households with moderate or severe hunger. Consumption in both household categories was much higher at endline than at interim.

Table 5.11 Women's consumption of targeted nutrient-rich value chain commodities by Gendered Type

Characteristic	Any targeted commodity	Groundnuts	Soya beans	Pigeon peas	Cow-peas	Orange Fleshed Sweet-Potato (OFSP)	Local Dark Green Leafy Veg (DGLV)	Orange Maize	n
INTERIM									
Male and female adults	51.9	41.7	2.7	0.9	2.8	0.5	14.9	1.4	883
Female adult(s) only	65.8	53.2	0.5	0	1.1	0	26.3	0.6	46
Male adult(s) only	^	^	^	^	^	^	^	^	3
Child(ren) only (no adults)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
ENDLINE									
Male and female adults	70.63	62.07	13.16	1.77	5.52	2.81	8.66	2.43	1553
Female adult(s) only	67.01	59.08	14.21	0.20	3.60	0.00	7.53	3.14	282
Male adult(s) only	65.63	54.95	6.88	0.00	10.74	1.63	10.41	0.00	78
Child(ren) only (no adults)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0

Source(s): FTF ZOI Interim Survey, Zambia 2012 and FTF ENDLINE Survey, Zambia 2018.

^ Results not statistically reliable, n<30

n/a not available – there were no child headed households

Table 5.12 Women's Consumption of targeted nutrient-rich value chain commodities by education, household size and hunger status

Characteristic	Any targeted commodity	Groundnuts	Soya beans	Pigeon peas	Cowpeas	Orange Fleshed Sweet-Potato (OFSP)	Local Dark Green Leafy Veg (DGLV)	Orange Maize	n
INTERIM									
Educational attainment									
No education	53.2	42.3	2.2	0.0	4.7	1.2	18.5	2.7	190
Less than primary	50.7	39.4	3.2	2.0	2.1	0.0	15.0	1.5	402
Primary	55.0	46.3	2.0	0.0	2.1	0.6	14.8	0.0	303
Secondary or more	38.5	32.9	2.8	0.0	0.0	0.0	1.7	3.6	37
Household size									
Small (1-5 members)	47.0	34.0	4.1	0.0	3.5	0.5	15.1	1.8	230
Medium (6-10 members)	54.8	46.0	1.7	1.4	1.7	0.5	15.4	1.3	596
Large (11+ members)	53.5	42.7	3.1	0.0	6.3	0.0	17.3	0.0	106
Household hunger									
Little to no hunger	56.6	47.3	2.9	1.4	3.2	0.5	15.7	1.9	674
Moderate or severe hunger	45.3	3.0	2.0	0.0	1.7	0.4	15.3	0.2	257
ENDLINE									
Educational attainment									
No education	65.56	60.95	7.37	0.61	4.61	1.75	13.6	1.48	95
Less than primary	68.46	62.26	13.64	1.53	6.77	1.97	9.54	1.86	727
Primary	71.72	60.61	13.93	1.84	4.25	3.15	7.42	3.35	884
Secondary or more	68.83	61.56	9.68	0	6.58	0.54	8.09	0.8	205
Household size									
Small (1-5 members)	68.57	59.65	12.6	1.33	4.82	2.37	8.32	2.53	1086
Medium (6-10 members)	71.5	63.21	13.45	1.5	6.57	2.39	9.25	2.41	771
Large (11+ members)	73.49	68.04	16.12	3.67	2.36	1.79	3.98	1.01	56
Household hunger									
Little to no hunger	70.45	61.67	13.11	1.55	5.45	2.76	8.01	2.53	1493
Moderate or severe hunger	67.9	60.15	12.83	1.16	5.5	0.9	10.62	2.07	420

Source(s): FTF ZOI Interim Survey, Zambia 2012 and FTF ENDLINE Survey, Zambia 2018.

5.3.2 Children's Consumption of Targeted Nutrient-Rich Value Chain Commodities

Table 5.13 presents children's consumption of targeted NRVCC. Estimates are shown for all children 6-23 months, as well as by characteristics of the child, caregiver, and household. Children's characteristics include sex and age, and caregivers' characteristics include educational attainment. While, household characteristics include gendered household type, household size, and household hunger.

The consumption of any targeted commodity for all children increased from 57.3 percent at the interim to 71.6 percent in the endline. Groundnuts remained the highest consumed across the surveys followed by Soya beans and local dark green leafy vegetables. These results are consistent across children characteristics, household size and hunger status as shown in Tables 5.13 and 5.15. Due to sample size problem, the results for children's consumption of targeted NRVCC cannot be fully compared across all gendered household type (see table 5.14)

A larger proportion of children in the Zambia ZOI consumed any targeted NRVCC, groundnut, cowpea and orange-fleshed sweet potato at endline in 2018, fewer children consumed soya beans, pigeon peas, dark-leafed vegetables and orange maize at endline than in the interim in 2015 (Table 5.13).

Table 5.13 Children's consumption of targeted nutrient-rich value chain commodities

Characteristic	Any targeted commodity	Groundnuts	Soya beans	Pigeon peas	Cowpeas	Orange Fleshed Sweet-Potato (OFSP)	Local Dark Green Leafy Veg (DGLV)	Orange Maize	n
INTERIM									
Total All Children (6-23 months)	57.3	45.5	14	1.4	0.4	1.8	10.8	3.5	206
Child sex									
Male	55.3	41.9	14.5	1.2	0.7	2	12.1	0.9	108
Female	59.9	50.3	13.2	1.8	0	1.5	9.2	7	98
Child age									
6-11 months	57.3	54.5	8.4	0.5	0	0.4	6.7	2.8	72
12-17 months	55.2	45.3	17.8	1.6	1.3	3.1	11.4	4.6	67
18-23 months	59.9	31.8	17.6	2.7	0	2.3	16.5	3.1	67
Caregiver's educational attainment									
No education	63	52.4	12.8	2.5	0	4.9	12.3	2.9	48
Less than primary	53.7	38.3	12	1.5	1	0.1	13.5	6.2	92
Primary	55.4	47.3	18.7	0.2	0	1.3	5.8	0.2	63
Secondary or more	^	^	^	^	^	^	^	^	3
ENDLINE									
Total All Children (6-23 months)	71.6	63.3	11.4	0.8	6.1	3.6	6.4	2	516
Child sex									
Male	71.5	64.4	9	0.9	6.8	4.1	5	2.9	261
Female	71.6	62.1	13.9	0.7	5.4	3.1	7.8	1	255
Child age									
6-11 months	63.5	54.9	10.3	0	5.4	4.5	5	3.6	167
12-17 months	69.1	61.7	10.1	1.2	3.9	1.9	5.3	1.2	175
18-23 months	81.6	72.8	13.7	1.1	9	4.6	8.7	1.3	174
Caregiver's educational attainment									
No education	^	^	^	^	^	^	^	^	24
Less than primary	70.6	62.7	10	0	8.6	2.7	6.6	2.3	205
Primary	69.1	62.2	12.1	1.8	5.6	2.5	7.2	1.5	232
Secondary or more	86.5	70.2	16.9	0	0.9	11.8	3.7	3.8	55

Source(s): FTF ZOI Interim Survey, Zambia 2012 and FTF ENDLINE Survey, Zambia 2018.

^ Results not statistically reliable, n<30.

Table 5.14 Children's consumption of targeted nutrient-rich value chain commodities by Gendered household type

Characteristic	Any targeted commodity	Groundnuts	Soya beans	Pigeon peas	Cowpeas	Orange Fleshed Sweet-Potato (OFSP)	Local Dark Green Leafy Veg (DGLV)	Orange Maize	n
INTERIM									
Male and female adults	57.3	44.8	14.5	1.5	0.5	1.9	11.6	3.7	193
Female adult(s) only	^	^	^	^	^	^	^	^	12
Male adult(s) only	^	^	^	^	^	^	^	^	1
ENDLINE									
Male and female adults	72.04	63.91	11.95	0.49	6.3	3.22	6.97	2.12	430
Female adult(s) only	67.17	58.28	8.96	2.95	6.02	5.13	3.85	1.45	73
Male adult(s) only	^	^	^	^	^	^	^	^	13

Source(s): FTF ZOI Interim Survey, Zambia 2012 and FTF ENDLINE Survey, Zambia 2018.

^ Results not statistically reliable, n<30.

Table 5.15 Children's consumption of targeted nutrient-rich value chain commodities by education, household size and hunger status

Characteristic	Any targeted commodity	Groundnuts	Soya beans	Pigeon peas	Cowpeas	Orange Fleshed Sweet-Potato (OFSP)	Local Dark Green Leafy Veg (DGLV)	Orange Maize	n
INTERIM									
Household size									
Small (1-5 members)	45.1	31.1	4.7	2.1	0	0.7	15.1	6.1	40
Medium (6-10 members)	64.5	52.1	19.6	1.2	0.7	2.4	10.6	2.8	141
Large (11+ members)	^	^	^	^	^	^	^	^	25
Household hunger									
Little to no hunger	56.9	44.1	11.4	1.7	0.6	2.5	13	1.5	152
Moderate or severe hunger	58.1	49.2	20.6	0.7	0	0	5.1	8.7	54
ENDLINE									
Household size									
Small (1-5 members)	69.32	59.74	10.3	0.74	6.65	3.43	5.1	0.9	277
Medium (6-10 members)	75.35	68.09	12.64	0.94	5.55	4.1	7.69	3	224
Large (11+ members)	^	^	^	^	^	^	^	^	25
Household hunger									
Little to no hunger	71.19	62.8	11.86	0.58	6.37	3.99	6.82	2.09	407
Moderate or severe hunger	72.93	65.19	9.62	1.6	5.12	2.25	4.74	1.57	109

Source(s): FTF ZOI Interim Survey, Zambia 2012 and FTF ENDLINE Survey, Zambia 2018.

^ Results not statistically reliable, n<30.

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 ages 15-49 years

Body mass index (BMI) is 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.

The mean BMI among the women of reproductive age group is 22.93 percent. The majority (72.14 percent) have a BMI categorized as normal weight, 17.36 are overweight, while only 5.53 percent and 4.98 percent are underweight and obese, respectively. As shown in Table 6.1, BMI and age of the women are not linearly associated although younger women in the 15-19 and 20-24 age groups have a higher prevalence of normal weight than the older women and adolescent women 15-19 years have a much greater prevalence of underweight. The rest of the disaggregated variables do not vary according to the variation in BMI of the women.

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

Characteristic	Mean BMI	BMI category (%)				n[1]
		Under-weight	Normal weight	Overweight	Obese	
All non-pregnant women of reproductive age	**22.93**	**5.53**	**72.14**	**17.36**	**4.98**	**1,716**
Age						
15-19	21.30	10.01	82.84	6.64	0.50	373
20-24	22.43	3.23	81.89	12.96	1.91	343
25-29	23.45	3.79	67.44	21.63	7.14	256
30-34	24.28	3.83	62.12	24.96	9.08	248
35-39	23.56	4.93	65.61	23.73	5.72	213
40-44	23.45	5.97	64.81	20.64	8.58	153
45-49	23.70	6.00	62.97	22.63	8.39	130
Educational attainment						
No education	23.63	2.66	72.10	17.59	7.65	91
Less than primary	22.86	5.70	72.50	16.54	5.26	656
Primary	22.89	5.39	72.12	17.94	4.55	792
Secondary or more	23.05	7.13	70.83	17.47	4.57	177
Gendered household type						
Male and female adults	22.87	6.02	72.38	16.51	5.09	1406
Female adults only	23.31	3.81	68.80	22.74	4.65	244
Male adults only	22.93	1.25	78.65	16.30	3.80	66
Household size						
Small (1–5 members)	22.97	5.65	71.50	18.10	4.75	967
Medium (6–10 members)	22.87	5.16	73.01	16.34	5.50	698
Large (11+ members)	23.07	8.11	72.23	17.16	2.50	51
Household hunger						
Little to no hunger	22.95	5.69	71.71	17.27	5.34	1338
Moderate or severe hunger	22.87	4.96	73.69	17.67	3.68	378

Source: Zambia Feed the Future ZOI Survey, 2018–2019

[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, disaggregates' sample sizes may not total to the aggregated sample size

Table 6.2 compares women's anthropometry results between the phase one baseline and endline ZOI Surveys. Average BMI has essentially remained the same (from 22.54 to 22.93) with almost complete overlap in confidence intervals between baseline and endline.

The prevalence of underweight and overweight in women did not change much between baseline and endline. However, there has been an increase in prevalence of obesity in the Zambia ZOI. Between the baseline and the endline, obesity rates in women increased from 2.45 percent to 4.98 percent, and from 3.00 percent to 4.98 percent between the interim and the endline surveys.

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

Indicator	Baseline (2012)	95% confidence interval	Interim (2015)	95% confidence interval	Endline (2018)	95% confidence interval[1]
Average BMI	22.54	n/a	22.6	n/a	22.93	22.75-23.11
Prevalence of underweight women (%)[2]	6.3	4.4 – 8.3	5.1	3.40 – 7.80	5.53	4.44 - 6.61
Prevalence of overweight women (%)	15.8	n/a	17.6	n/a	17.36	15.56-19.15
Prevalence of obese women (%)	2.45	n/a	3	n/a	4.98	3.95-6.01

Source: Zambia Feed the Future ZOI Survey, 2012–2013; Zambia Feed the Future ZOI Survey, 2018–2019
n/a not available
[1] 2019 figures not computed where n/a for baseline and Interim

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.[25] The stunting measures presented below include the Feed the Future ZOI Survey indicator of moderate stunting (<-2 SD) and severe stunting (<-3 SD). Mean z-scores are also presented.

Table 41 shows the prevalence of stunting and severe stunting and mean height-for-age z-scores for children under five 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.

In the Zambia ZOI, over one third (35.47 percent) of the children under 5 years of age are stunted while severe stunting (z<-3 SD) affects 12.6 percent of the children. The prevalence of stunting in the ZOI is similar to the Eastern Province average of 34.2 percent reported in the 2018-19 DHS.[26] The

[25] WHO (2006).

[26] Central Statistical Office (CSO) [Zambia], Ministry of Health (MOH) [Zambia], and ICF. 2019. Zambia Demographic and Health Survey 2018: Key Indicators. Rockville, Maryland, USA: Central Statistical Office, Ministry of Health, and ICF.

mean Z-score is -1.54, which indicates that the mean height-for-age of the children in the ZOI is below that of the WHO reference group.[27] Stunting rate is lowest (11 percent) in children less than 11 months old while it is highest (49 percent) in children between the ages of 23 to 34 months old. Stunting reduces to about 32 percent in older children between 48 to 59 months old. In relation to the education levels of the caregiver, stunting rates appear to be higher among children with caregivers who have higher education levels, while the prevalence of stunting among children with caregivers with no education is 31.5 percent. The rate of stunting in children with caregivers who have primary education and secondary or more education is 37.2 percent and 37.4 percent respectively.

In relation to the household type, households with only female adults have higher (39.4 percent) prevalence of stunted children compared to households with male and female adults and male-only. Stunting is higher in households with moderate to severe hunger at 38.9 percent for households compared to 34 percent for households experiencing little or no hunger.

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	
	Stunted (<-2 SD)	Severely stunted (<-3 SD)	Z-score	n[1]
All children under age 5 years	**35.47**	**12.63**	**-1.54**	**1499**
Child sex				
Male	35.79	13.23	-1.58	739
Female	35.16	12.04	-1.50	760
Child age				
0-11 months	17.68	5.60	-0.77	306
12-23 months	39.52	16.51	-1.71	338
24-35 months	49.53	17.92	-1.94	302
36-47 months	38.35	15.04	-1.75	265
48-59 months	31.65	7.48	-1.50	288
Caregiver educational attainment[2]				
No education	31.51	11.32	-1.48	69
Less than primary	33.12	10.82	-1.43	543
Primary	37.19	13.45	-1.59	737
Secondary or more	37.37	15.90	-1.71	150
Gendered household type				
Male and female adults	34.89	11.97	-1.51	1256
Female adults only	39.38	17.17	-1.71	187
Male adults only	34.81	11.61	-1.47	56
Household size				
Small (1–5 members)	35.43	13.07	-1.56	835

[27] WHO. (2006)

Medium (6–10 members)	36.25	12.25	-1.53	609
Large (11+ members)	27.36	10.17	-1.33	55
Household hunger				
Little to no hunger	34.60	12.15	-1.49	1176
Moderate or severe hunger	38.88	14.52	-1.74	323

Source: Zambia Feed the Future ZOI Survey, 2018–2019

[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, disaggregates' sample sizes may not total to the aggregated 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[28] that is more than 2 SDs below the median of the 2006 WHO Child Growth Standard. The wasting measures and mean z-scores presented below include the Feed the Future ZOI Survey wasting indicator of moderate or severe wasting (<-2SD), severe wasting (<-3SD), and the percentage of children who are overweight (>-2SD) and obese (>-3SD).

Table 6.4 shows the prevalence of wasting, severe wasting, and mean weight-for-height z-scores for children under five years in the P1-ZOI. The table also shows the prevalence of overweight and obesity among 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.

About 3.0 percent of the children under the age of five suffer from wasting (Table 6.4). Severe wasting affects 0.79 percent of the under five children, while 3.92 and 1.47 percent are overweight and obese respectively. The mean weight-for-height Z-score for the Zambia ZOI is 0.22, which is 0.22 more than the WHO reference group mean. A larger proportion of girls suffer from wasting at 3.12 percent compared to 2.98 percent among boys. Unlike stunting, wasting is highest (6.72 percent) among the youngest children (0 to 11 months old), while older children are less wasted. In fact, only 1.65 percent of children aged 48 to 59 months are wasted. The associations between the prevalence of wasting and other disaggregated variables such as education level of the caregiver and household hunger are mixed.

[28] A weight-for-length z-score is calculated for children ages 0-23 months and any other children who are measured lying down. A weight-for-height z-score is calculated for children ages 24-59 months 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					n[1]
	Wasted	Severely wasted (<-3 SD)	Overweight (> +2SD)	Obese (> +3SD)	Mean z-score	
All children under age 5 years	**3.05**	**0.79**	**3.92**	**1.47**	**0.22**	**1501**
Child sex						
Male	2.98	0.87	5.02	1.86	0.30	743
Female	3.12	0.72	2.83	1.08	0.15	758
Child age						
0-11 months	6.72	2.13	6.54	3.78	0.20	305
12-23 months	3.88	0.42	3.04	1.47	0.01	339
24-35 months	1.32	0.31	4.14	1.18	0.42	304
36-47 months	1.37	0.45	3.51	0.54	0.44	265
48-59 months	1.65	0.70	2.45	0.26	0.10	288
Caregiver's educational attainment[2]						
No education	1.85	1.37	2.53	0.00	0.43	69
Less than primary	3.72	1.27	3.83	2.02	0.16	543
Primary	2.88	0.34	3.29	1.35	0.24	740
Secondary or more	1.97	1.08	8.19	0.68	0.28	149
Gendered household type						
Male and female adults	3.36	0.95	4.20	1.46	0.22	1257
Female adults only	1.38	0.00	3.20	1.93	0.23	189
Male adults only	1.89	0.00	0.00	0.00	0.30	55
Household size						
Small (1–5 members)	3.56	1.09	3.97	2.01	0.21	833
Medium (6–10 members)	2.62	0.46	3.75	0.74	0.21	613
Large (11+ members)	0.00	0.00	5.02	1.24	0.50	55
Household hunger						
Little to no hunger	3.07	0.70	3.75	1.09	0.21	1178
Moderate or severe hunger	2.97	1.16	4.58	2.96	0.28	323

Source: Zambia Feed the Future ZOI Survey, 2018–2019

[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, disaggregates' sample sizes may not total to the aggregated 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 underweight indicator of moderate or severe underweight (<-2 SD), 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 five 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.

Nearly one in every 10 (9.25 percent) children under 5 years of age is underweight, while severe underweight affects 1.36 percent in the ZOI. The mean Z-score is -0.7 indicating that the age-for-weight Z-score for the children in the Zambia ZOI is lower than the Z-score for the WHO reference group. Similar to wasting, a larger proportion (about 10 percent) of girls in the ZOI are underweight compared to 8.63 among boys. When disaggregated by age of the child, the prevalence of underweight follows a similar pattern to stunting. The youngest children (0 to 11 months) have the lowest rates of underweight (7.24 percent) while the older age group (24 to 35 months) have a prevalence of 11.95 percent. In relation to education levels of the caregivers, prevalence of underweight increases with increase in education level of the caregivers. Underweight rates are 7.50, 8.79, 9.51 and 10.45 percent for care givers with no education, less than primary, primary and secondary or more, respectively. Households experiencing little or no hunger have a lower prevalence (8.95 percent) of underweight than households experiencing moderate to severe hunger (10.43 percent).

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)		
All children under age 5 years	**9.25**	**1.36**	**-0.71**	**1535**
Child sex				
Male	8.63	1.11	-0.69	756
Female	9.85	1.60	-0.73	779
Child age				
0-11 months	7.24	1.13	-0.34	321
12-23 months	12.05	1.43	-0.84	346
24-35 months	11.95	2.24	-0.78	309
36-47 months	6.98	0.80	-0.73	269
48-59 months	7.21	1.10	-0.85	290
Caregiver's educational attainment[2]				
No education	7.50	0.00	-0.53	70

Less than primary	8.79	1.70	-0.68	558
Primary	9.51	1.37	-0.74	754
Secondary or more	10.45	0.64	-0.74	153
Gendered household type				
Male and female adults	9.22	1.09	-0.70	1285
Female adults only	9.74	3.11	-0.81	193
Male adults only	8.07	1.23	-0.63	57
Household size				
Small (1–5 members)	9.01	0.84	-0.70	853
Medium (6–10 members)	9.93	2.20	-0.75	625
Large (11+ members)	5.24	0.00	-0.37	57
Household hunger				
Little to no hunger	8.95	1.14	-0.69	1207
Moderate or severe hunger	10.43	2.23	-0.77	328

Source: Zambia Feed the Future ZOI Survey, 2018–2019

[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, disaggregates' sample sizes may not total to the aggregated 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.

Compared to baseline, the prevalence of stunting in the ZOI has declined by about 10 percentage points from 45.52 percent to 35.47 percent and the decline is statistically significant at 5 percent level (Table 6.6). Stunting rates between the interim survey and the endline survey reduced from 38.40 percent to 35.47 percent, but this decline is not statistically significant. Due to overlapping confidence intervals, it cannot be concluded whether changes in the prevalence of wasting and underweight between the baseline and endline or interim or between interim and endline are statistically significant.

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

	Baseline (2012)	95 % confidence interval	Interim (2015)	95 % confidence interval	Endline (2018)	95 % confidence interval
Prevalence of stunted children under 5 years	45.50 [a]	41.2 – 49.9	38.40	32.10 – 45.10	35.47 [a]	33.04 - 37.89
Prevalence of wasted children under 5 years	2.70	1.5 – 3.9	2.00	1.00 – 4.00	3.05	2.18 - 3.92
Prevalence of underweight children under 5 years	13.28	10.4 – 16.2	13.60	9.90 – 18.40	9.25	7.80 - 10.70

Source: Zambia Feed the Future ZOI Survey, 2012-2013; Zambia Feed the Future ZOI Survey 2015;Zambia Feed the Future ZOI Survey, 2018–2019

Confidence intervals (CIs) demonstrate the reliability of estimated values.

[a-b] Subgroups with the same superscript have non-overlapping 95% confidence intervals, and are statistically different. Comparisons are within rows.

7. Women's Empowerment in Agriculture

This chapter presents findings related to empowerment of women within the ZOI. 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 the Feed the Future program. 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.[29] The WEAI was subsequently streamlined to make it less time-consuming and expensive to collect the required data and to improve some problematic and difficult-to-understand modules. The improvements resulted in the A-WEAI. For more information, please see Appendix A2.3 and the WEAI and A-WEAI survey modules and manuals, which can be found online.[30]

Although data to calculate the WEAI was collected in the Feed the Future Zambia phase one baseline ZOI Survey, data to calculate only components of the A-WEAI was collected in the 2018 endline survey.

7.1 Overview

This report only presents results for the 5DE for female primary adult decision makers.

The five domains 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 into 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 within their community, assessed through group membership. The *Time* domain reflects individuals' workload. An individual is identified as "empowered" by the 5DE if he or she achieves adequacy in at least 80 percent of the weighted indicators (equivalent to four out of five domains).

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

[30] IFPRI. (2013). http://feedthefuture.gov/lp/womens-empowerment-agriculture-index

Table 7.1 WEAI domains, indicators, and definitions of adequacy

Domain	Definition of domain	Indicator	Definition of Indicator Adequacy
Production	Sole or joint decision making over food and cash-crop farming, livestock, and fisheries	Input in productive decisions	Respondents 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.
Resources	Ownership of productive resources such as land, livestock, agricultural equipment, and consumer durables; access to credit	Ownership of assets	Respondents own alone or jointly at least two small assets or one large asset.
Income	Sole or joint control over income and expenditures	Control over use of income	Respondents have substantial input into most or all decisions or feel they can make a decision for at least one agricultural activity.
Leadership	High social capital—membership in economic or social groups	Group membership	Respondents are active members of at least one group in their community.[2]
Time	Allocation of time to productive and domestic tasks	Workload	Respondents spend 10.5 hours or less performing work activities in a 24-hour period.[3]

Respondents who live in households that did not access credit are considered inadequate on access to credit and decisions on credit.
Respondents who report that no groups exist in their communities or who are not aware of any groups in their community are counted are considered in adequate on group membership.
Respondents who reported the 24 hours preceding the survey to being an atypical workday are excluded.

The primary adult decision makers are individuals age 18 years or older who self-identify as the primary decision makers during the collection of the household roster information.[31] There can only be one female and one male primary adult decisionmaker in each household; however, a household can have only a female primary adult decisionmaker or only a male primary adult decisionmaker. If there are no adults 18 or older in the household, the household will not have any primary adult decision makers.

Table 7.2 presents the percentages of female primary adult decisionmakers who achieve adequacy in each A-WEAI empowerment indicator at baseline, interim and at endline.

The empowerment indicators show that control over the use of income increased from 95.09 percent in the baseline to 97.4 percent at endline. However, workload also significantly increased to 89.7 percent at endline from 20.93 recorded in the baseline. The lowest levels of achievement were for the indicator on access to credit and input into decisions at 40.40 percent, yet the adequacy achieved in the endline is higher than the baseline value of 26.38 percent. The indicators of input in productive decisions

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

(90.72 percent), and group membership (74.24 percent) showed a reduction in the endline, with achievement of adequacy being 88.5 percent and 88.6 percent respectively. Whilst, ownership of assets had increased from 84.13 percent at baseline to 88.60 at endline.

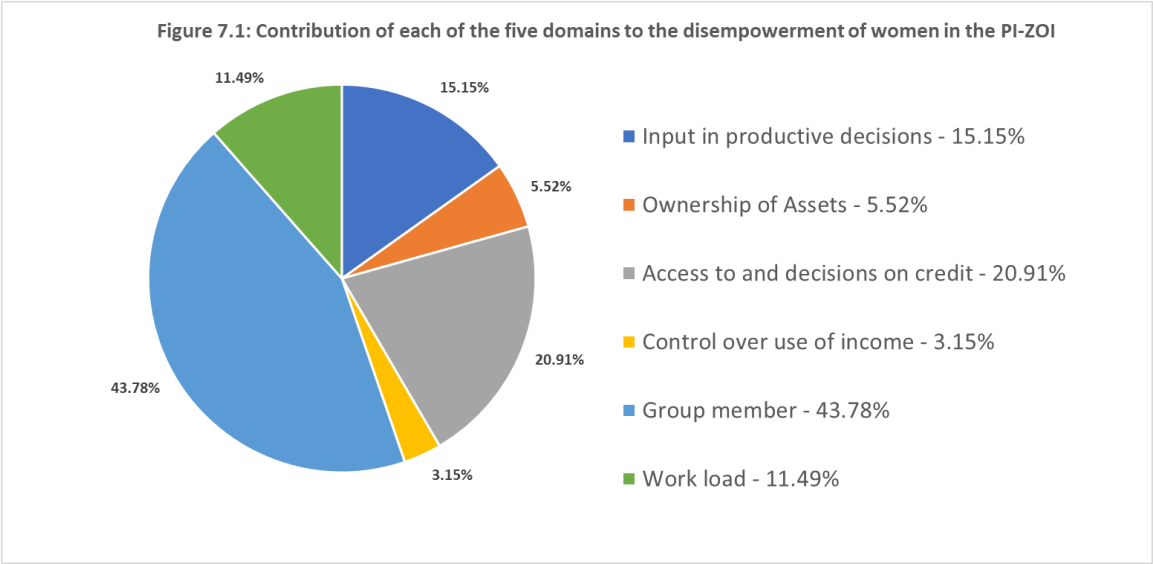
Table 7.2 Achievement of adequacy in WEAI empowerment indicators among female primary adult decision makers comparing Feed the Future phase one Interim and endline ZOI Survey

		Baseline		Endline		Interim		Endline	
Domain	**Indicator**	%	n	%	n	%	n	%	n
Production	Input in productive decisions	90.72	1325	88.50	1697	91.70	719	88.50	1697
Resources	Ownership of assets	84.13	1325	88.60	1742	93.00	719	88.60	1742
	Access to credit and input into decisions	26.38	1325	40.40	1745	30.50	719	40.40	1745
Income	Control over use of income	95.09	1325	97.40	1727	94.80	719	97.40	1727
Leadership	Group membership	74.24	1325	71.20	1745	75.00	719	71.20	1745
Time	Workload	20.93	1325	89.70	615	72.20	719	89.70	615

Source: Zambia Feed the Future ZOI Survey 2015; Zambia Feed the Future ZOI Survey, 2018–2019.
Estimates exclude households that do not have a female primary adult decisionmaker or that have missing or incomplete indicator data.
n/a data not available

Figure 7.1 shows the contribution of each of the five domains to the disempowerment of women. Asset ownership and control over the use of income have a low contribution towards women's disempowerment at 5.52 percent and 3.15 percent respectively. The largest contributors to women's disempowerment are group membership (43.78 percent) and access to and decisions on credit (20.91 percent).

Figure 7.1: Contribution of each of the five domains to the disempowerment of women in the P1-ZOI



Source: Zambia Feed the Future ZOI Survey, 2018

7.2 Production

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

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

The most prevalent economic activities that women participate in are food crop farming (95.64 percent), livestock raising (74.34 percent) and cash crop farming (59.33 percent). Wage and salaried employment (36.7 percent) and non-farm economic activities (31.3 percent) have lower participation, with fishing or fishpond culture having the lowest participation at 0.39 percent. Women have high input (79 percent and over) into decisions about all the economic activities they were engaged in. The highest input is in the non-farm economic activities at 90.48 percent, and the least in cash crop farming (79.66 percent). Fishing and fishpond culture only has 5 women participating in it.

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

	Participates in activity		Has input[1] into decisions about activity	
	Women		Women	
	Percent	N[2]	%	N[3]
All primary adult decision makers	**98.26**	**1745**	**90.7**	**1745**
Economic activity				
Food crop farming	95.64	1717	81.93	1645
Cash crop farming	59.33	1717	79.66	990
Livestock raising	74.34	1717	83.66	1286
Fishing or fishpond culture	0.39	1717	^	5
Non-farm economic activities	31.3	1717	90.48	518
Wage or salaried employment	36.7	1717	89.77	586

Source: Zambia Feed the Future ZOI Survey, 2018–2019
[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 decisionmaker or that have missing or incomplete indicator data.
[3] Estimates exclude individuals who do not participate in an activity or report that no decision was made.
^ Results not statistically reliable, n<30.

7.3 Resources

Adequacy in *Resources* is measured by two indicators: (1) ownership of assets, and (2) 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 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 7.3 presents the findings for ownership of productive resources.

The most commonly owned assets are agricultural land (88.4 percent), chicken, ducks, turkeys and pigeons (60.7 percent), non-mechanized farm equipment (87.2 percent), house or other structures (77.5 percent), cell phones (63.5 percent) and means of transportation (53.3 percent). The least commonly owned assets are fishponds or fishing equipment (0.5 percent), mechanized farm equipment (6.10 percent) and non-farm business equipment (8.1 percent). Women reported owning solely or jointly over 50 percent of all but two of the listed assets. The assets with the least ownership by women were means of transport (4.5 percent) and non-agricultural land (6.0 percent). The assets where women had the highest levels of sole or joint ownership were chickens, ducks and pigeons at 78.1 percent, non-mechanized farm equipment at 76.9 percent, and large consumer durables at 71.4 percent.

Table 7.4 Household and female primary adult decisionmaker ownership of productive resources in the P1-ZOI

Type of resource	Someone in the household owns item		Woman owns solely or jointly	
	%	n[1]	%	n[2]
Agricultural land	88.40	1742	54.40	1562
Large livestock	35.50	1742	52.10	665
Small livestock	36.40	1742	53.90	630
Chickens, ducks, turkeys, and pigeons	60.70	1742	78.10	1068
Fishpond or fishing equipment	0.50	1742	^	9
Non-mechanized farm equipment	87.20	1742	76.90	1540
Mechanized farm equipment	6.10	1742	51.90	110
Non-farm business equipment	8.10	1742	58.90	130
House or other structures	77.50	1742	69.10	1387
Large consumer durables	16.80	1742	71.40	266
Small consumer durables	41.30	1742	61.70	710
Cell phone	63.50	1742	54.10	1100
Non-agricultural land	14.40	1742	6.00	245
Means of transportation	53.30	1742	4.30	934

Source: Zambia Feed the Future ZOI Survey, 2018

[1] Estimates exclude households that have no primary adult decisionmaker 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 decisionmaker or that have missing or incomplete indicator data.

[3] ^ Results not statistically reliable, n<30.

Table 7.5 presents the percentage of female primary adult decision makers who reported 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.

Approximately 40.44 percent of women reported having a household member that received a loan. Most of these loans (32.12 percent) were cash loans and mainly sourced from friends or relatives (19.9 percent) and group-based microfinance (8.30 percent). The credit source that was reported to have provided the least number of loans was the formal lender (0.99 percent).

About 80.29 percent of the women reported contributing to decisions on credit decisions and a higher proportion made the decision on how to use the loan (75.7 percent). The results show that over 70 percent of the women reported contributing to credit decisions across all the sources, with the highest being on the informal lender (87.02 percent), friends or relatives (80.43 percent), and group-based

microfinance sources (86.31 percent). On the question of making a decision on whether to borrow, the women reported making the highest contributions to decisions on lending from group-based microfinance (86.31 percent), and informal lenders (73.42 percent). For the contributions on how to use the loan, the trend was the same as the contribution on whether to borrow, with contributions being highest for the informal lender and group-based microfinance at 82.99 percent and 81.55 percent respectively.

Table 7.5 Access to credit among female primary adult decision makers in the P-ZOI

		Credit source (%)[1]				
	Any source (%)	Non-government organization	Informal lender	Formal lender	Friends or relatives	Group-based micro-finance
Household received a loan						
Any loan	40.44	4.18	6.07	0.99	24.53	11.54
In-kind loan	9.54	2.31	0.59	0.03	3.85	3.17
Cash loan	32.12	1.81	5.31	0.96	19.99	8.30
n[2]	**1745**	**1745**	**1745**	**1745**	**1745**	**1745**
Primary adult decisionmaker contributed to credit decision						
Any decision	80.29	72.35	87.02	^	80.43	86.31
On whether to borrow	68.51	58.17	73.42	^	67.20	80.26
On how to use loan	75.70	69.85	82.99	^	75.77	81.55
n[3]	**683**	**73**	**103**	**16**	**417**	**188**

Source: Zambia Feed the Future ZOI Survey, 2018–2019

[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 decisionmaker or that have missing or incomplete indicator data.
[3] Estimates exclude households that do not have a female primary adult decisionmaker, that did not receive a loan, or that have missing or incomplete indicator data.
^ Results not statistically reliable, n<30.

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 agricultural activity. Table 7.6 shows the percentages of female primary adult decision makers who have input into the decisions made regarding the use of income derived from an economic activity.

About 89.32 percent of women reported have had input into decision making on the use of income. Overall, over three quarters of the women reported having an input over the use of income for all the activities they were engaged in. The highest input was in non-farm economic activities (89.36 percent) and the lowest input was in cash crop farming (77.96 percent).

Table 7.6 Input into decision making on use of income among female primary adult decision makers in the P1-ZOI

	Has input[1] into income from activity			
	Men		Women	
	%	n	%	n2
All primary adult decision makers	**n/c**		**89.32**	**1745**
Activity				
Food crop farming	n/c		82.70	1541
Cash crop farming	n/c		77.96	981
Livestock raising	n/c		82.25	1247
Fishing or fishpond culture	n/c		^	5
Non-farm economic activities	n/c		89.63	517
Wage or salaried employment	n/c		89.36	585

Source: Zambia Feed the Future ZOI Survey, 2018–2019

[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 decisionmaker 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] n/c not collected

7.5 Leadership

Adequacy in *Leadership* is measured through an individual's active involvement with community organizations. Respondents are considered adequate if they are active members of at least one community organization. Table 7.7 shows the percentages of primary adult decision makers who are active members of organizations in their community.

In total, 71.2 percent of the women decision makers were group members. The highest membership was in religious groups (51.8 percent) and the lowest membership was in local government (1.1 percent) and mutual help and insurance groups (1.9 percent).

Table 7.7 Group membership among female primary adult decision makers in the P1-ZOI

	Is an active group member	
	Women	
	%[1]	N[2]
All primary adult decision makers	**71.2**	**1745**
Type of group		
Agricultural producer's group	17.3	1745
Water users' group	14.2	1745
Forest users' group	3.8	1745
Credit or microfinance group	27.6	1745
Mutual help or insurance group	1.9	1745
Trade and business association	3	1745
Civic or charitable group	4.3	1745

Local government	1.1	1745
Religious group	51.8	1745
Other women's group	14.8	1745

Source: Zambia Feed the Future ZOI Survey, 2018–2019

[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 decisionmaker or that have missing or incomplete data.

7.5 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 in a 24-hour period. Table 7.8 shows the percentages of female primary adult decision makers that performed the listed activities a day prior to the survey and the average number of hours that they spent performing each activity. 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 15-minute time use increment. 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 15-minute period.

The mean amount of time that women spend is highest on is sleeping and resting (5.463), social activities and hobbies (0.553), and domestic work (fetching food and water) (0.493). The least amount of time is spent on school and homework (0.003) and weaving, sewing, and textile care (0.005). There is no time, on average, spent on exercising.

Table 7.8 Time allocation among female primary adult decision makers in the P1-ZOI

	Primary activity		Secondary activity[1]	
Activity	Percent of women	Mean hours devoted	Percent of women	Mean hours devoted
Sleeping and resting	99.90	5.463	4.65	0.019
Eating and drinking	99.09	0.071	3.42	0.001
Personal care	92.36	0.019	1.52	0.000
School and homework	0.56	0.003	0.10	0.000
Work as employed	2.08	0.025	0.12	0.001
Own business work	7.90	0.096	0.27	0.001
Farming, livestock, fishing	36.06	0.235	1.85	0.001
Shopping, getting services	8.85	0.035	0.38	0.000
Weaving, sewing, textile care	1.36	0.005	0.41	0.000

Cooking	89.60	0.166	5.13	0.005
Domestic work (fetching food and water)	91.40	0.493	3.45	0.003
Care for children, adults, elderly	54.18	0.071	11.47	0.022
Travel and commuting	57.25	0.118	0.83	0.000
Watching TV, listening to radio, reading	5.30	0.013	1.52	0.002
Exercising	0.23	0.000	0.07	0.000
Social activities and hobbies	80.46	0.553	13.78	0.045
Religious activities	10.78	0.069	2.45	0.000
Other	n/a	n/a	n/a	n/a
n[2]	**1745**	**1745**	**1745**	**1745**

Source: Zambia Feed the Future ZOI Survey, 2018–2019

[1] Respondents were allowed to report up to two activities per time use increment (15 minutes) in the 24 hours 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 15-minute period.

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

8. SUMMARY AND CONCLUSIONS

The Zambia ZOI endline assessment was designed to measure change between baseline and endline, and between interim and endline indicator values, but it was not designed to draw conclusions about attribution or causality.

There has been a statistically significant reduction in the prevalence of poverty in the Zambia ZOI from the baseline value of 88.00 percent in 2010 to 75.34 percent in 2018. This represents a 12.66 percentage point reduction in the prevalence of poverty in the ZOI. The depth of poverty reduced by 18.39 percentage points from 50.4 to 32.01 percent over the same period. On the other hand, average per capita daily expenditure declined from USD 1.19 at baseline to USD 0.91 at endline. While declines in average per capita daily expenditure and poverty incidences may seem contradictory, a closer look at the distribution of per capita daily expenditure shows that it was higher for the lower 50 percent of the population in the endline than it was in the interim, but expenditure declined for the top 25 percent across the two ZOI surveys. This implies that daily per capita expenditure was becoming more equitable in the ZOI and this could partly explain the observed decline in poverty incidence.

Female adult only households are more likely to be poor than male adult only households and male and female adult households. Similar to baseline estimates, the 2018 endline estimates that about 70.72 percent of female adult only households live on less than USD1.25/day compared to only 38.93 percent for male adult only households in the Zambia ZOI. The same trend is seen for the national extreme poverty threshold computed at USD 0. 81/day, with significantly more female adult only households (45.73 percent) facing extreme poverty than male adult only households (13.77 percent).

In the Zambia ZOI, the prevalence of households with moderate or severe hunger has reduced by 1.36 percentage points from the baseline estimate of 23.2 percent to 21.8 percent in 2018. Moderate hunger was more prevalent in households with only female adults (28.68 percent), larger households (21.67 percent), and households with no education (35.63 percent). Of those that reported severe hunger, the highest proportion was from male adults only households (9.75 percent), small households (2.99 percent), and households with no education (9.37 percent).

The number of food groups consumed by women of productive age significantly increased from 4.00 at baseline to 4.37 at endline, as did the proportion of children aged 6 – 23 months receiving a minimum acceptable diet, which increased from 16.20 to 34.9 percent over the same period. Stunting in children under five years significantly reduced by 10.03 percentage points from 45.5 to 35.47 percent, and underweight reduced by 4.05 percentage points from 13.3 to 9.25 percent between baseline and endline in the Zambian ZOI. There were no statistically significant changes in the prevalence of underweight in women of productive age, and wasting in children under five years between baseline and endline in the Zambian ZOI.

Overall, the results show that the average index value for the five domains of empowerment (5DE) show that women in the Zambian ZOI had inadequate achievements in 34.0 percent of the domains and the largest contributors to their disempowerment are group membership (43.78 percent) and access to and decision on credit (20.91 percent).

Results from the endline survey clearly indicate that efforts directed toward reducing poverty, reducing

child malnutrition, and increasing women's economic opportunities in the Zambian ZOI contributed to a reduction in almost all the key FTF indicators. However, despite these positive changes, there is still need to continue implementing programs and investments in the ZOI as the prevailing poverty rates and malnutrition levels are still very high.

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5. APPENDIX 1. SUPPLEMENTARY DATA AND FIGURES

A1.1. ZOI Survey 2018–2019 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 Zone of Influence.

Indicator	Estimate	SD	95% CI	DEFF	Non-response rate	n
Daily per capita consumption expenditures in constant 2010 USD (2005 PPP)						
All households	0.91	0.64	0.88-0.93	5.33	n/a	1880
Male and female adults	0.85	0.51	0.83-0.88	3.88	n/a	1546
Female adults only	0.98	0.74	0.89-1.07	2.73	n/a	267
Male adults only	1.86	1.51	1.49-2.22	1.31	n/a	67
Prevalence of Poverty: Percentage of people living on less than $1.25/day (2005 PPP)						
All households	75.34	43.11	73.39 - 77.29	3.58	n/a	1880
Male and female adults	77.76	41.6	75.68 - 79.83	2.9	n/a	1546
Female adults only	70.72	45.59	65.23 - 76.22	2.24	n/a	267
Male adults only	38.93	49.13	26.94 - 50.91	1.25	n/a	67
Depth of Poverty: Mean percentage shortfall relative to $1.25/day poverty line (2005 PPP)						
All households	32.01	26.24	30.82 - 33.20	4.46	n/a	1880
Male and female adults	33.02	25.91	31.72 - 34.31	2.9	n/a	1546
Female adults only	31.16	27.51	27.85 - 34.48	2.24	n/a	267
Male adults only	12.81	20.93	7.71 - 17.92	1.25	n/a	67
Prevalence of moderate and severe hunger						
All households	21.84	41.32	19.97 - 23.71	1.91	n/a	1880
Male and female adults	19.56	39.68	17.58 - 21.54	1.61	n/a	1546
Female adults only	33.36	47.24	27.67 - 39.05	1.31	n/a	267
Male adults only	29.25	45.84	18.07 - 40.43	1.52	n/a	67
Women dietary diversity: Mean number of food groups consumed by women of reproductive age						
All women ages 15-49	4.37	1.4	4.30 - 4.43	2.87	8.29	1913
Prevalence of underweight women of reproductive age						
All non-pregnant women ages 15-49	5.53	22.86	4.44 - 6.61	1.14	0.98	1716
Prevalence of exclusive breastfeeding among children under age 6 months						
All children	51.9	50.12	44.00 - 59.80	1.07	n/a	157
Male children	48.16	50.27	37.11 - 59.20	1.53	n/a	82
Female children	56.05	49.97	44.55 - 67.54	1.19	n/a	75
Prevalence of children 6-23 months receiving minimum acceptable diet						
All children	34.92	47.72	30.79 - 39.05	1.43	0.19	516
Male children	35.86	48.05	29.93 - 41.78	1.38	0.39	255
Female children	34.04	47.48	28.26 - 39.83	1.26	0	261
Prevalence of stunted children under age 5 years						

All children	35.47	46.86	33.04 -37.89	1.63	3.76	1499
Male children	35.79	47.97	32.32 - 39.25	1.53	4.18	739
Female children	35.16	47.78	31.75 - 38.56	1.19	3.68	760
Prevalence of wasted children under age 5 years						
All children	3.05	17.19	2.18 - 3.92	1.41	3.78	1501
Male children	2.98	17.01	1.75 - 4.20	1.35	3.66	743
Female children	3.12	17.39	1.88 - 4.36	0.91	3.93	758
Prevalence of underweight children under age 5 years						
All children	9.25	28.98	7.80 - 10.70	1.62	1.54	1535
Male children	8.63	28.1	6.62 - 10.64	1.69	1.96	756
Female children	9.85	29.82	7.75 - 11.95	1.06	1.27	779
Abbreviated Women's Empowerment in Agriculture Index						
All women	n/a					
Women ages 18-29	n/a					
Women ages 30 and older	n/a					

Source: Zambia Feed the Future ZOI Survey, 2018–2019
SD = standard deviation; CI = confidence interval; DEFF = design effect
[1] [Information on how non-response rate was calculated]
n/a data not available

6. APPENDIX 2. METHODOLOGY

A2.1 Sampling and weighting

Sampling

The sample of households for the Feed the Future Zambia ZOI Survey 2018 followed a two-stage stratified cluster sampling design. In the first stage, enumeration areas (EAs) were selected from 2010 census sampling frame in 5 districts using probability proportional to size (PPS) sampling. In the second stage, 1,880 households were selected for interview at random from a comprehensive list of households generated during a listing operation that was fielded from the 10th of October to the 16th of October 2018.

Weighting

Data required for weighting of survey data were collected throughout the sampling process, and included: (1) EA measure of size (where size is in terms of number of population or number of households) used for selection of EAs, (2) measure of size of strata from which EAs are drawn, (3) measure of size of EAs at time of listing, and (4) response rates among households, women, and men. Weights were calculated for the following to account for differing levels of non-response:

1. Households (used for household level indicators derived from Modules 2, 3, and 4)
2. Children 0–59 months (Module 9, for children's dietary and anthropometry indicators)
3. Women 15–49 years (Module 8, for women's dietary indicators)
4. Women 15–49 years who are not pregnant (Module 8, underweight indicator)
5. Primary female decision makers (Module 7, A-WEAI)

Design weights were calculated based on the separate sampling probabilities for each sampling stage and for each cluster. We have:

P_{1hi} = first-stage sampling probability of the i-th cluster in stratum *h*.
P_{2hi} = second-stage sampling probability within the i-th cluster (household selection).

The probability of selecting cluster *i* in the sample is:

$$P_{1hi} = \frac{m_h \times N_{hi}}{N_h}$$

The second-stage probability of selecting household in cluster *i* is:

$$P_{2hi} = \frac{n_{hi}}{L_{hi}}$$

Where:
m_h = number of sample clusters selected in stratum *h*.
N_{hi} = total population in the frame for the *i*-th sample cluster in stratum *h*.
N_h = total population in the frame in stratum *h*.
n_{hi} = number of sample households selected for the *i*-th sample cluster in stratum *h*.

L_{hi} = number of households listed in the household listing for the *i*-th sample cluster in stratum *h.*

The overall selection probability of each household in cluster *i* of stratum *h* is the product of the selection probabilities of the two stages:

$$P_{hi} = P_{1hi} \times P_{2hi} = \frac{m_h \times N_{hi}}{N_h} \times \frac{n_{hi}}{L_{hi}}$$

The design weight for each household in cluster *i* of stratum *h* is the inverse of its overall selection probability:

$$W_{hi} = \frac{1}{p_{hi}} = \frac{N_h \times L_{hi}}{m_h \times N_{hi} \times n_{hi}}$$

The sampling weight was calculated with the design weight corrected for non-response for each of the selected clusters. Response rates were calculated at cluster level as ratios of the number of interviewed units over the number of eligible units, where units could be household or individual (woman, child, or primary adult decisionmaker).

As discussed in the limitations section, the weights should have been calculated separately for the 82 and the 12 EAs, since they represent independent sampel draws, and they should have been readjusted to take into account the household replacement procedure used in the survey. However, analysis of key indicators showed that the effect of correcting for the independent sample draws did not make a meaningful difference in the results, and, since only a small proportion of the sample was replacement households, the weight adjustment was not done because the effect on the estimates was assumed to be negligible

A2.2 Poverty prevalence and consumption expenditure methods

Data source

The household expenditure and poverty indicators calculated for the ZOI endline survey were derived using the data collected in the survey and were compared to estimates collected in the Zambia 2010 and 2015 Living Conditions Monitoring Surveys. The Zambia 2010 LCMS collected data from 19,385 rural and urban households during February-March 2010, whereas the Zambia LCMS 2015 collected data from 12,250 households during April-May 2015. In each case, the sampling frame used a two-stage stratified cluster design, based on the Zambian Census of Population and Housing; the sample was representative at the national level, by urban and rural areas, and by province.
The ZOI consists of five districts in Zambia's Eastern Province. Out of the overall sample, LCMS 2010 included 1431 households in the ZOI and LCMS 2015 included 1229 households in the ZOI. These sample sizes are large enough to provide reliable poverty estimates for the ZOI as a whole, but not on a district-by-district basis.

Data preparation

The expenditure data collected in the Zambia LCMS and the FTF endline survey are divided into three main components: food consumption, non-food consumption, and housing. The methods used to collect each type of data are summarized below. After collection, the expenditure data are aggregated into a single number – the "consumption aggregate" – which represents the material well-being of the household. The methodology used applies many of the principles of the LSMS approach, but departs from the LSMS protocol in significant respects.

Food Consumption

LCMS collects data on food consumption from three sources: cash purchases, food consumed out of the household's own production, and food received as gifts or otherwise without payment. Consumption of maize products in this survey is measured over a 7-day recall period; and all other food consumption is also measured over a 7-day recall period. Households are asked to report their consumption of each food out of a list of 128 food items.

In all three cases, households report both the quantity and value of food consumed. In the case of purchased food, the value is the amount of money actually spent on that item; in the other two cases, the quantity of each food is recorded and the household asked to estimate the value of that quantity if they had purchased it in the market.

Non-Food Expenditures

The non-food consumption component captures household spending on frequent and less frequent (but still regular) consumption items (as opposed to items that are used for production purposes) – 85 items in all. It includes education expenses, medical expenses, and personal consumption items including alcoholic beverages and cigarettes, and personal services. It also captures remittances sent to other households.

The flow of services derived from durable consumer goods, such as furniture, kitchen appliances, and electronic items is also not included in the consumption aggregate. This approach represents a departure from the LSMS approach to expenditure measurement.

Expenditures on financial assets (e.g. repayment of debt, interest payments) are therefore excluded from the consumption aggregate.

Housing

The estimate of the monthly value of expenditure on housing services was based on the data on the estimated rental value of the dwelling, plus associated services such as water and electricity. In the case of households that rent their dwelling, the household's actual spending was used for this purpose. In contrast, for the majority of households that own their dwelling and so do not pay actual rent, the rental value of their houses needed to be imputed; the same applies to households that received free or subsidized housing. In these cases, the rental value was imputed. First, such households were asked to estimate the rent they would need to pay if they rented the same home; if the household provided an estimate, that estimate was used as the rental value. Otherwise, the rental value was estimated on the basis of a regression analysis of rents paid on dwellings in the same location with similar construction materials and other characteristics, such as access to water and sanitation.

Currency conversions using CPI and PPP

Zambia applies spatial price deflators that capture differences in the level of prices on a provincial basis. Inflation adjustments were based on the average monthly value of the Consumer Price Index over the two or three months of the survey period. The currency conversions presented in this analysis were prepared as follows: Daily per capita consumption expenditures measured in local currency 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:

$$\frac{2005\ CPI\ LCU}{Oct/Nov\ 2018\ CPI\ LCU} * \frac{1}{2005\ PPP\ LCU} * \frac{1}{(2005\ CPI\ USD — 2010\ CPI\ USD)}$$

Where:
2005 PPP LCU = 2.830
Oct/Nov 2018 CPI LCU = 198.2045 for 2018 (this an average for the survey months in October and November 2018)
2005 CPI LCU = 100, 2010 CPI USD = 111.65
2005 CPI USD = 100.00.
The conversion factor was 0.085.

Poverty thresholds

National thresholds

Zambia measures poverty on an adult-equivalence basis, taking into account the different consumption needs of different household members. The adult equivalence scale is based on age alone, rather than

age and sex as in some other countries. Children 3 years or younger are counted as 0.36 adult equivalents (AE); 4-6 year-olds as 0.62 AE; 7-9 year-olds as 0.76 AE; 10-12 year-olds as 0.78 AE; all those 13 years and older are treated as full adults. Two national poverty lines are used: an extreme poverty line based on the estimated cost of obtaining a minimal food basket, and a moderate poverty line that starts with the extreme poverty line, but adds an allowance for spending on nonfood essentials based on the observed spending patterns of households whose actual food consumption was close to the food poverty line.

The national poverty line of ZMW 214.3 per adult equivalent per month from the 2015 Living Conditions Monitoring Survey (LCMS 2015) is used to compute national poverty. According to the Feed the Future interim report, this translates to about USD 0.81 per person per day at 2005 PPP.

International thresholds

The International Comparison Program collected data to update the PPP exchange rates used to compare national accounts statistics and living standards across different economies in 2011. The World Bank updated then updated the $1.25 2005 PPP poverty threshold to a comparable $1.90 2011 PPP in late 2015. The update reflected changes in the market prices and currencies based on the 2011 PPP; all the while maintaining the substantive level of poverty measured by the $1.25 2005 PPP measure. The World Bank raised the poverty line to USD 1.90 using 2011 PPP rates in October 2015, but to facilitate comparisons with baseline estimates, daily per capita consumption expenditures are provided using 2005 PPP rates. For that reason, all indicators and analyses presented in this report have utilized the 2005 PPP to convert between Zambian kwacha and US dollars.

Weights

Expenditure estimates are reflective of the consumption and poverty of individuals within the ZOI. The data are collected at the household level, and individual estimates are produced by multiplying the household sampling weight by the number of household members. Confidence intervals are computed taking into account the survey design, based on the svyset procedure with the Stata statistical package.

2.3 Criteria for achieving adequacy for Women's Empowerment in Agriculture Indicators

The table below presents the five Abbreviated Women's Empowerment in Agriculture (A-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.[32]

Dimension	Indicator	Survey questions	ZOI Survey variables	Adequacy criteria	Inadequacy criteria
Production	Indicator 1. Input in productive decisions	"How much input do you have in making decisions about food crop farming, cash crop farming, livestock raising, and fishing or fishpond culture?" "When decisions are made regarding inputs for agricultural production, types of crops to grow, taking crops to the market, and livestock raising, who is it that normally takes the decision?" "To what extent do you feel you can make your own decisions regarding these aspects of household life if you want(ed) to?"	g01-g03	Participates in activity and has some input; OR someone else decides but respondent feels he or she could decide if wanted to for at least two decisions	Participates but does not have at least some input; OR does not make the decision NOR feels could
Resources	Indicator 2.1. Ownership of assets	"Who would you say owns most of the agricultural land, large livestock, small livestock, chicken/ducks/turkey/pigeon, fish pond or fishing equipment, non-mechanized farm equipment, mechanized farm equipment, house, large consumer durable goods, small durable goods, cell phone, other land, and means of transportation ?"	g301a-g301b g302-g306	Owns at least one large asset	Household does not own any assets; OR household owns assets but respondent does not own at least one large asset alone or jointly
	Indicator 2.2. Access to and decisions over credit	"Who made the decision to borrow from a NGO, informal lender, formal lender, friends or relatives, or group-based microfinance or lending (savings/credit group)?" "Who makes the decision about what to do with the	ac01-ac02 ac03	Can alone or jointly make at least one decision regarding at least one source of credit	Household has no credit; OR household has credit but respondent does not participate in any decisions about it

[32] Feed the Future Guide to Statistics

		money/item borrowed from [SOURCE]?"			
Income	Indicator 3. Control of use of income	"How much input did you have in decisions on the use of income generated from food crop farming, cash crop farming, livestock raising, non-farm economic activities, wage and salary employment, and fishing or fishpond culture, ?" "When decision are made regarding your own wage or salary employment, major household expenditures, and minor household expenditures, who is it that normally takes the decision?" To what extent do you feel you can make your own decisions regarding these aspects of household life if you want(ed) to?	g500-g502	Participates in activity and has some input or feels can make the decision if the respondent wanted to for at least one income decision; excludes minor household expenditures	Participates in activity but has no or little input about decisions regarding income generated from it
Leadership	Indicator 4. Membership in economic or social group	"Are you an active member of an agricultural/ livestock/ fisheries producers' group, waters users' group, forest users' group, credit/ microfinance group, trade and business association, mutual help/ insurance group; trade and business association, civic groups, local government, religious group, other women's group, or any other formal or informal organization?"	gc01-gc02	Belongs to at least one economic or social group	Does not belong to at least one economic or social group
Time	Indicator 5. Workload	The survey collected information on respondents' time allocation for a 24-hour period, the day preceding the survey. Information was collected for primary and secondary activities and reported in 15-minute intervals.	Computed from time allocation variables 04_00 to 03_45	Works less than 10.5 hours in a 24-hour period[1]	Works 10.5 hours or more in 24- hour period

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

APPENDIX 3. POVERTY RATES

Characteristic	Prevalence of poverty[1]		Depth of poverty[2]		Average consumption shortfall of the poor[3]		
	Percent	n[4]	Percent of poverty line	n[4]	USD (2011 PPP)	Percent of poverty line	n[4]
All households	86.83	1880	42.38	1880.00	0.85	44.59	1631.00
Gendered household type							
Male and female adults	89.78	1546	43.74	1546.00	0.85	44.50	1383.00
Female adults only	80.25	267	40.51	267.00	0.88	46.40	219.00
Male adults only	45.91	67	19.15	67.00	^	^	29
Children only (no adults)	-	-	-	-	-	-	0
Household size							
Small (1–5 members)	80.15	1081	35.66	1081.00	0.76	39.92	865.00
Medium (6–10 members)	95.54	736	50.73	736.00	0.94	49.24	704.00
Large (11+ members)	98.83	63	59.04	63.00	1.07	56.43	62.00
Household educational attainment							
No education	89.46	85	49.68	85.00	0.99	51.87	76.00
Less than primary	88.91	721	46.94	721.00	0.93	48.91	642.00
Primary	89.44	882	41.39	882.00	0.80	41.85	780.00
Secondary or more	67.36	192	27.99	192.00	0.70	36.75	133.00

APPENDIX 4. FTF ZAMBIA ZOI SURVEY INSTRUMENT

APPENDIX 5. FTF ZAMBIA ZOI SURVEY CONSENT PROCESS

Appendix 4 includes the Zambia 2018 Feed the Future Zone of Influence Survey Instrument with the informed consent statement for different respondents. The statement addresses all of the major elements of informed consent. Interviewers were trained to understand the purpose and content of informed consent, to read the informed consent statement to respondents, and to answer respondents' questions about the survey or informed consent. Only household members who provided informed consent were interviewed. These household members indicated consent orally, which was documented in the CAPI by the interviewer. Box 1 presents a sample of the informed consent used in the survey

Box 2.1.1 Informed Consent

Enumerator: Please read - paraphrase the consent information to the respondent and obtain consent. Thank you for the opportunity to speak with you. We are a research team from Central Statistical Office and Indaba Agricultural Policy Research Institute. We are conducting a survey to learn about agriculture, food security, food consumption, nutrition and wellbeing of households in this area. Your household has been selected to participate in an interview that includes questions on topics such as your family background, dwelling characteristics, household expenditures and assets, and nutrition of women and children. The questions will take at least 1-3 hours to complete. If additional questions are relevant for members of your household, the interview in total will take approximately 2-3 hours to complete. We will take breaks if participants would like to pause to eat or drink. Your help in answering these questions is very much appreciated.

If you choose to participate, you may refuse to answer certain questions, or you may stop participating at any time. Your responses will be kept COMPLETELY CONFIDENTIAL; we will not share any information that identifies you. After entering the questionnaire into a database, we will destroy all information such as name which links these responses to you. Your responses will be summed together with those of roughly 1900 other households in Eastern Province and general averages from analysis will be reported. If you have questions about this survey, you may contact the Director, CSO headquarters in Lusaka. If you have any questions for IAPRI about this survey, you may contact Mr. Chance Kabaghe at +260 211 261194/97.You indicate your voluntary consent by participating in this interview: may we begin

Household members age 15-17 who were eligible for the interview (either as the oldest responsible member of the household, as a respondent to the women's questionnaire, or as a respondent to the agricultural components of the survey) and children under the age of 5 had the opportunity to provide informed assent through their parents or guardians.

All survey staff signed a contract that had confidentiality statement before going into field. Respect for the confidentiality of respondent information was maintained throughout the survey process. Interviewers were not allowed to interview anyone they know or to discuss any identified respondent's information with anyone other than the field team member or field supervisor. IAPRI used SurveyBe, a CAPI that operates offline and then uploaded to the server. All data transmitted to IAPRI servers were encrypted. Datasets for internal USAID use will retain only personally identifiable information (PII) that are essential to analysis (household GPS coordinates); these data will not be shared publicly. All PII and other information that would allow deduction of respondent identities will be stripped from data sets before they are made public.