FEED THE FUTURE

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


Photo: Morgana Wingard

# TANZANIA

## Feed the Future Zone of Influence

## 2014-16 Interim Assessment Report

## July 2018

USAID

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# List of Acronyms

| | |
|---|---|
| 5DE | Five Domains of Empowerment |
| ASDP | Agricultural Sector Development Program |
| BFS | Bureau for Food Security |
| BMI | Body Mass Index |
| CAADP | Comprehensive Africa Agriculture Development Program |
| CI | Confidence Interval |
| CPI | Consumer Price Index |
| DEFF | Design Effect |
| DHS | Demographic and Health Survey |
| EA | Enumeration Area |
| FANTA | Food and Nutrition Technical Assistance Project |
| Feed the Future | Feed the Future |
| FTFMS | Feed the Future Monitoring System |
| FYDP | Five Year Development Plan |
| GOT | Government of Tanzania |
| GPI | Gender Parity Index |
| HAZ | Height-for-age Z-score |
| HBS | Household Budgetary Survey |
| HDI | Human Development Index |
| HH | Household |
| HHS | Household Hunger Scale |
| IFPRI | International Food Policy Research Institute |
| IP | Implementing Partner |
| ISS | Interim Supplemental Survey |
| IYCF | Infant and Young Child Feeding |
| LCU | Local Currency Unit |
| LSMS | Living Standards Measurement Survey |
| M&E | Monitoring and Evaluation |
| MAD | Minimum Acceptable Diet |
| MDD-W | Women's Minimum Dietary Diversity |
| MDG | Millennium Development Goals |
| MKUKUTA | National Strategy for Growth and Poverty Reduction |
| MYS | Multi Year Strategy |
| NBS | National Bureau of Statistics |
| NRVCC | Nutrient-Rich Value Chain Commodity |
| PBS | Population Based Survey |
| PPP | Purchasing Power Parity |
| PPS | Probability Proportional to Size Sampling Method |

| | |
|---|---|
| SD | Standard Deviation |
| SAGCOT | Southern Agricultural Growth Corridor of Tanzania |
| SUN | Scaling Up Nutrition |
| TAFSIP | Tanzania Agriculture and Food Security Implementation Plan |
| TDHS | Tanzanian Demographic and Health Survey |
| TZNPS | Tanzanian National Panel Survey |
| USAID | United States Agency for International Development |
| USD | United States Dollar |
| USG | United States Government |
| WAZ | Weight-for-age Z-score |
| WDDS | Women's Dietary Diversity Score |
| WEAI | Women's Empowerment in Agriculture Index |
| WHO | World Health Organization |
| WHZ | Weight-for-height Z-score |
| ZOI | Zone of Influence |

# Executive Summary

## Background

Feed the Future, led by the U.S. Agency for International Development (USAID), seeks to reduce poverty and undernutrition in 19 developing countries through its focus on accelerating growth of the agriculture sector, addressing root causes of undernutrition, and reducing gender inequality.

Feed the Future monitors its performance in part by periodic assessments of a number of standardized indicators. These indicators reflect data collected through population-based surveys in the geographic areas targeted by Feed the Future interventions, known as the Feed the Future Zones of Influence (ZOI). This document reports the results of the first interim assessment of Feed the Future's population-based indicators for the ZOI in Tanzania.

The Feed the Future ZOI in Tanzania includes the mainland regions of Dodoma, Manyara, Morogoro, Mbeya and Iringa, and the islands of Zanzibar. All ZOI regions consist of both rural and urban populations. The three regions of Dodoma, Manyara, and Morogoro received more concentrated Feed the Future interventions than the other regions and are known as "in-depth regions."

This first interim assessment will provide the U.S. Government (USG) interagency partners, USAID Bureau for Food Security (BFS), USAID Missions, host country governments, and development partners with information about short-term progress of the ZOI indicators. The assessment is designed for use as a monitoring tool. Secondary data is used to measure most key indicators and thus in many cases the sample size is large enough to detect change over time. However, Feed the Future ZOI sample calculations are not designed to support conclusions of causality or program attribution.

## Interim Assessment Indicators

Fourteen Feed the Future indicators are included in this assessment: (1) Daily per capita expenditures (as a proxy for income) in USG-assisted areas; (2) Prevalence of poverty; (3) Depth of poverty; (4) Prevalence of households with moderate or severe hunger; (5) Women's dietary diversity; (6) Prevalence of children 6-23 months receiving a minimum acceptable diet (MAD); (7) Prevalence of exclusive breastfeeding among children under 6 months of age; (8) Prevalence of underweight women; (9) Prevalence of stunted children under 5 years of age; (10) Prevalence of wasted children under 5 years of age; (11) Prevalence of underweight children under 5 years of age; (12) Women's Empowerment in Agriculture Index; (13) Prevalence of anemia among women of reproductive age; and (14) Prevalence of anemia in children 0-59 months of age.

## Interim Assessment Data Sources

Data for the Feed the Future ZOI indicators presented in this assessment are drawn from two secondary sources and one primary source. The two secondary sources are the 2015-16 Tanzania Demographic and Health Survey (TDHS) and the 2014-15 Tanzania National Panel Survey (TzNPS). Both secondary data sources contain sufficiently detailed location information such that households from the Tanzania Feed the Future Zone of Influence can be isolated and analyzed. The TDHS, conducted from August 2015 until February 2016, contains data used to construct infant and young child feeding practice indicators as well as indicators that represent the nutritional status of women of reproductive age and children under age five. The TzNPS, conducted from October 2014 until November 2015, contains household consumption expenditure data which can be used to construct household economic status and poverty indicators.

The primary data source is the Feed the Future Interim Supplemental Survey (FTFISS). This survey was conducted from May until July 2016 as a follow-up to the TzNPS in the ZOI by the Tanzania National Bureau of Statistics (NBS), in collaboration with the World Bank's Living Standards Measurement Study-Integrated Survey on Agriculture program. The same TzNPS households from the ZOI were re-visited in order to collect indicators not found in the secondary data sources: Women's Empowerment in Agriculture Index (WEAI), Women's Minimum Dietary Diversity (MDD-W), and Household Hunger Scale (HHS).

## Summary of Key Findings

While the Feed the Future Indicator Tables found on pages 9-13 compare the baseline to interim indicator values, the intention of this report is to summarize interim indicator estimates. For many indicators, the samples are sufficient to capture change over time. These changes over time will be discussed below. However, the analysis has not been designed to support conclusions of causality or program attribution.

### Household Economic Status

Average daily per capita expenditure in the Tanzania ZOI is $2.31 (2010 United States Dollars (USD)). The prevalence of poverty, defined as the percentage of individuals living below $1.25 2005 purchasing power parity (PPP) per day, is 36.7 percent. The depth of poverty (the mean shortfall for all individuals relative $1.25 2005 PPP per day poverty line) is 10.0 percent.

While it appears as though the prevalence and depth of poverty has gone down over time since the baseline for the ZOI as a whole as well as for each gendered household type and geographic area, none of these changes is significant at the 5 percent level; the reduction in the prevalence of poverty in the ZOI is significant at the 10 percent level. However, there has been a significant increase in daily per capita expenditure in the Tanzania ZOI, from $1.94 at baseline to $2.31 at

interim (2010 USD), as well as a significant increase in this indicator for the male and female adult household disaggregate and the mainland ZOI household disaggregate.

### Women's Empowerment in Agriculture Index Indicators

The Women's Empowerment in Agriculture Index (WEAI) sample reported above averages rates of participation in decisionmaking over household income and ownership of assets. To account for the high rates of women's asset ownership and decisionmaking influence over income, two sets of WEAI results were calculated. The first set of results used the original adequacy thresholds set for the five WEAI domains. In the second set of WEAI results, the adequacy thresholds were adjusted for two indicators. Please refer to the WEAI section of this report for more details.

The overall WEAI score for the Feed the Future ZOI was 0.92, but dropped to 0.88 after adjusting the adequacy thresholds. The adjusted Five Domains of Empowerment (5DE) index value is 0.87. Overall, approximately 57.6 percent of women have achieved adequate empowerment. Those who are not yet empowered (about 41 percent) have a mean 5DE score of 0.69 indicating that women not yet empowered had adequate achievements on average in about 69 percent of the domains.[1] The adjusted Gender Parity Index (GPI) is 0.97, and 73.7 percent of the women in the survey have achieved gender parity. The average empowerment gap between the 26.2 percent of women without gender parity and the adult males in their household is 0.12, which is relatively low.

### Hunger and Dietary Intake

Seventeen percent of households in the Tanzania ZOI have moderate to severe hunger. This may be an underestimate due to the timing of the interim survey, during the harvest season. Women's dietary diversity, or the mean number of food groups (out of nine possible) consumed by women of reproductive age in the Tanzania ZOI, is 4.50. This is a significant increase by over one-third from the baseline of 3.37. This result should be interpreted with caution, since the interim survey collected women's dietary diversity data during the harvest season and baseline dietary diversity data was collected during the lean season.

The prevalence of exclusive breastfeeding among children under 6 months in the Tanzania ZOI is 60.4 percent. This is significantly higher than the prevalence at baseline of 44.6 percent. The prevalence of MAD among children 6-23 months in the ZOI at interim is very low at 7.2 percent. Only comparisons for breastfed children and the components of MAD can be made across time from baseline to interim. The prevalence of MAD for breastfed children is 8.0 at interim, down significantly from 15.3 percent at baseline. The percentage of children receiving Minimum Meal

[1] A woman is defined as empowered in the 5DE if she reaches the threshold of empowerment [i.e., if she achieves adequacy] in 80 percent or more of the weighted 5DE indicators.

Frequency and Minimum Dietary Diversity are 30.4 and 21.4 percent, respectively, at interim, having declined significantly from baseline rates of 39.9 and 30.5 percent respectively.

**Nutritional Status of Women and Children**

The prevalence of women's underweight (women of reproductive age with a Body Mass Index (BMI) below 18.5) in the Tanzania ZOI is 8.3 percent. Among children under 5 years in the ZOI, over one-third (35.2 percent) are stunted. Stunting is a height-for-age measurement that reflects chronic undernutrition. The prevalence of wasting is 5.3 percent and the prevalence of underweight is 13.5 percent. Wasting is a weight-for-height indicator of acute malnutrition, while underweight can indicate either acute or chronic malnutrition. The prevalence of anemia in women of reproductive age in the Tanzania ZOI is 36.1 percent, while the prevalence of anemia in children aged 6-59 months in the ZOI is 55.5.

With the exception of women's and children's anemia, most of the indicators of women's and children's nutritional status declined significantly from baseline to interim in the Tanzania ZOI. Prevalence of underweight women declined from 10.5 percent at baseline to 8.3 percent at interim. Prevalence of stunted children age 0-59 months declined from 48.3 percent at baseline to 35.2 percent at interim. Prevalence of underweight children declined from 18.7 percent to 13.5 percent between baseline and interim. While there was no significant difference in prevalence of child wasting from baseline to interim in the greater ZOI, there was a significant drop in the prevalence of wasting in Zanzibar, from 10.7 percent at baseline to 6.8 percent at interim. Meanwhile, the prevalence of women's anemia in the ZOI grew slightly, from 36.1 percent in the baseline to 36.9 percent at interim; the prevalence of anemia in children in the ZOI also grew, from 53.4 percent in the baseline to 55.5 percent at interim.

Baseline and interim estimates of indicator values in the ZOI are shown in the Feed the Future Zone of Influence Indicator Estimates table on the following pages. The first table shows results for the entire Zone of Influence, comprising five mainland regions plus Zanzibar, disaggregated by gendered household type, gender, or breastfeeding status. The second table shows results disaggregated by geographic area: Zanzibar alone, the mainland ZOI alone, and a 3-region portion of the mainland ZOI considered to have received more in-depth Feed the Future interventions (in-depth regions).

### *Feed the Future Zone of Influence Indicator Estimates: Tanzania*

| Feed the Future Indicator | Baseline (2010 11) | | | Interim (2014 16) | | |
|---|---|---|---|---|---|---|
| | Estimate | 95% CI[1] | n | Estimate | 95% CI | n |
| **Daily per capita expenditures (as a proxy for income) in USG-assisted areas (2010 USD)** | | | | | | |
| Individuals in all households[3] | 1.94 | 1.79-2.09 | 6035 | 2.31 | 2.03-2.59 | 4525 |
| Male and female adults[3] | 1.90 | 1.74-2.05 | 5266 | 2.29 | 1.98-2.60 | 3867 |
| Female adult(s) only | 1.83 | 1.60-2.05 | 662 | 2.21 | 1.88-2.53 | 578 |
| Male adult(s) only | 4.64 | 3.42-5.87 | 107 | 3.68 | 3.11-4.26 | 80 |
| Children only no adults | ^ | ^ | 0 | ^ | ^ | 0 |
| **Prevalence of Poverty: Percent of people living on less than $1.25 per day (2005 PPP)** | | | | | | |
| Individuals in all households | 43.7 | 38.6-48.8 | 6035 | 36.7 | 30.1-43.3 | 4525 |
| Male and female adults | 43.1 | 37.6-48.6 | 5266 | 35.3 | 28.5-42.0 | 3867 |
| Female adult(s) only | 51.1 | 42.3-59.8 | 662 | 48.4 | 37.6-59.3 | 578 |
| Male adult(s) only | 13.1 | -3.2-29.5 | 107 | 5.6 | -4.4-15.5 | 80 |
| Children only no adults | ^ | ^ | 0 | ^ | ^ | 0 |
| **Depth of Poverty: Mean percent shortfall relative to the $1.25 per day poverty line (2005 PPP)** | | | | | | |
| Individuals in all households | 12.3 | 10.4-14.2 | 6035 | 10.0 | 7.8-12.2 | 4525 |
| Male and female adults | 12.0 | 10.0-14.1 | 5266 | 9.6 | 7.2-12.0 | 3867 |
| Female adult(s) only | 15.5 | 11.7-19.3 | 662 | 13.2 | 9.6-16.8 | 578 |
| Male adult(s) only | 1.3 | -0.4-3.0 | 107 | 1.7 | -1.2-4.7 | 80 |
| Children only no adults | ^ | ^ | 0 | ^ | ^ | 0 |
| **Prevalence of households with moderate or severe hunger** | | | | | | |
| All households | n/a | n/a | n/a | 17.0 | 11.9-22.1 | 716 |
| Male and female adults | n/a | n/a | n/a | 14.2 | 8.8-19.6 | 558 |
| Female adult(s) only | n/a | n/a | n/a | 25.9 | 15.3-36.5 | 143 |
| Male adult(s) only | n/a | n/a | n/a | ^ | ^ | 15 |
| Children only no adults | n/a | n/a | n/a | ^ | ^ | 0 |
| **Women's Dietary Diversity: Mean number of food groups consumed by women of reproductive age** | | | | | | |
| All women age 15-49[3] | 3.37 | 3.12-3.61 | 1187 | 4.50 | 4.32-4.68 | 853 |
| **Feed the Future indicator** | **Baseline (2010 11)** | | | **Interim (2014 16)** | | |
| | **Estimate** | **95% CI[1]** | **n** | **Estimate** | **95% CI** | **n** |
| **Prevalence of exclusive breastfeeding among children under 6 months of age** | | | | | | |
| All children[3] | 44.6 | 34.7-54.5 | 291 | 60.4 | 52.4-68.4 | 273 |
| Male children[3] | 49.7 | 37.7-61.8 | 145 | 66.3 | 55.2-77.5 | 131 |
| Female children | 38.9 | 25.2-52.6 | 146 | 54.6 | 43.0-66.2 | 142 |
| **Prevalence of children 6-23 months receiving a minimum acceptable diet (MAD)[2]** | | | | | | |
| All children | n/a | n/a | n/a | 7.2 | 5.0-9.5 | 891 |
| Male children | n/a | n/a | n/a | 7.7 | 4.2-11.2 | 432 |
| Female children | n/a | n/a | n/a | 6.7 | 3.2-10.1 | 459 |
| Breastfed[3] | 15.3 | 11.2-19.3 | 726 | 8.0 | 5.4-10.6 | 745 |
| Non-breastfed | n/a | n/a | n/a | 3.3 | 0.0-6.6 | 146 |
| All children, Minimum Meal Frequency[3] | 39.9 | 32.8-47.0 | 859 | 30.4 | 25.3-35.5 | 891 |
| All children, Minimum Dietary Diversity[3] | 30.5 | 24.8-36.3 | 859 | 21.4 | 16.8-26.1 | 891 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Prevalence of underweight women** | | | | | | |
| All non-pregnant women age 15-49[3] | 10.5 | 8.9-12.1 | 3708 | 8.3 | 7.2-9.5 | 3629 |
| **Prevalence of stunted children under 5 years of age** | | | | | | |
| All children[3] | 48.3 | 44.3-52.2 | 2784 | 35.2 | 32.2-38.3 | 2851 |
| Male children[3] | 52.7 | 49.1-56.3 | 1387 | 39.5 | 34.9-44.2 | 1397 |
| Female children[3] | 43.9 | 38.1-49.8 | 1397 | 30.7 | 26.9-34.5 | 1454 |
| **Prevalence of wasted children under 5 years of age** | | | | | | |
| All children | 4.7 | 3.6-5.8 | 2784 | 5.3 | 4.1-6.5 | 2851 |
| Male children | 4.9 | 3.5-6.4 | 1387 | 5.9 | 4.2-7.5 | 1397 |
| Female children | 4.5 | 2.8-6.1 | 1397 | 4.7 | 3.2-6.3 | 1454 |
| **Prevalence of underweight children under 5 years of age** | | | | | | |
| All children[3] | 18.7 | 16.0-21.4 | 2784 | 13.5 | 11.5-15.5 | 2851 |
| Male children[3] | 20.3 | 17.1-23.4 | 1387 | 14.3 | 11.7-16.9 | 1397 |
| Female children[3] | 17.1 | 13.8-20.5 | 1397 | 12.6 | 10.2-15.0 | 1454 |
| **Prevalence of anemia in women** | | | | | | |
| All women age 15-49 | 36.1 | 32.4-39.7 | 3996 | 36.9 | 34.5-39.3 | 3927 |
| **Prevalence of anemia in children under 5 years of age** | | | | | | |
| All children | 53.4 | 49.9-56.8 | 2565 | 55.5 | 52.0-58.9 | 2601 |
| Male children | 55.5 | 50.3-60.7 | 1282 | 56.2 | 51.4-60.9 | 1277 |
| Female children | 51.3 | 47.0-55.6 | 1283 | 54.8 | 50.9-58.7 | 1324 |

Source(s): Daily per capita expenditures, prevalence and depth of poverty are all from 2010/11 and 2014/15 Tanzania NPS. Prevalence of exclusive breastfeeding, children receiving a minimum acceptable diet, underweight women, stunted, wasted, and underweight children are from the 2010/11 and 2015/16 Tanzania DHS. Prevalence of hunger and WEAI indices are from 2015 Feed the Future ISS. Women's dietary diversity is from the 2010/11 Tanzania DHS for the baseline and from 2016 Feed the Future ISS for the Interim.

n/a – Not available

[1] Confidence intervals (CIs) demonstrate the reliability of estimated values. Non-overlapping CIs do indicate significant differences between the two estimates. However, if CIs do overlap, the reader cannot conclude whether there is or is not a significant difference between baseline and interim estimates. An adjusted Wald test of the null hypothesis that the baseline and interim indicator means are equivalent was run for each indicator.

[2] A minimum acceptable diet (MAD) for children 6-23 months of age measures both the minimum feeding frequency and the minimum dietary diversity, as appropriate for both breastfed and non-breastfed children as well as for different age groups. The measure for breastfed children is straightforward, and involves counting the number of food groups consumed as well as the number of solid feedings over the last 24 hours. The measure for non-breastfed children differs slightly from that for breastfed children in that it does not count dairy as a food group to be included in the dietary diversity measure, instead counting milk feeds along with solids in the feeding frequency index, and requiring that at least two of these feeds be milk feeds. The 2010/11 TDHS does not include the number of milk feeds over the last 24 hours in its questionnaire, and thus cannot be used to generate prevalence of MAD for non-breastfed children.

[3] These indicators are significantly different across survey years, from baseline to interim.

### *Feed the Future Zone of Influence Indicator Estimates, by Geography: Tanzania*

| Feed the Future Indicator | Baseline (2010 11) | | | Interim (2014 16) | | |
|---|---|---|---|---|---|---|
| | Estimate | 95% CI[1] | n | Estimate | 95% CI | n |
| **Daily per capita expenditures (as a proxy for income) in USG-assisted areas (2010 USD)** | | | | | | |
| Individuals in all households[4] | 1.94 | 1.79-2.09 | 6035 | 2.31 | 2.03-2.59 | 4525 |
| Zanzibar | 2.11 | 1.92-2.30 | 2994 | 2.14 | 1.94-2.35 | 2623 |
| Mainland[4] | 1.92 | 1.75-2.09 | 3041 | 2.33 | 2.01-2.66 | 1902 |
| In Depth Regions[4] | 1.79 | 1.60-1.98 | 1671 | 2.33 | 1.88-2.77 | 1091 |
| **Prevalence of Poverty: Percent of people living on less than $1.25 per day (2005 PPP)** | | | | | | |
| Individuals in all households | 43.7 | 38.6-48.8 | 6035 | 36.7 | 30.1-43.3 | 4525 |
| Zanzibar | 34.0 | 26.6-41.3 | 2994 | 27.8 | 18.9-36.7 | 2623 |
| Mainland | 44.9 | 39.3-50.6 | 3041 | 38.0 | 30.5-45.5 | 1902 |
| In Depth Regions | 47.7 | 40.3-55.0 | 1671 | 44.0 | 33.3-54.7 | 1091 |
| **Depth of Poverty: Mean percent shortfall relative to the $1.25 per day poverty line (2005 PPP)** | | | | | | |
| Individuals in all households | 12.3 | 10.4-14.2 | 6035 | 10.0 | 7.8-12.2 | 4525 |
| Zanzibar | 7.9 | 5.3-10.5 | 2994 | 7.8 | 4.5-11.2 | 2623 |
| Mainland | 12.9 | 10.8-14.9 | 3041 | 10.3 | 7.9-12.8 | 1902 |
| In Depth Regions | 15.1 | 12.2-18.0 | 1671 | 13.0 | 9.4-16.7 | 1091 |
| **Prevalence of households with moderate or severe hunger** | | | | | | |
| All households | n/a | n/a | n/a | 17.0 | 11.9-22.1 | 716 |
| Zanzibar | n/a | n/a | n/a | 22.2 | 14.0-30.3 | 327 |
| Mainland | n/a | n/a | n/a | 16.5 | 11.0-22.0 | 389 |
| In Depth Regions | n/a | n/a | n/a | 19.3 | 11.3-27.2 | 212 |
| **Women's Dietary Diversity: Mean number of food groups consumed by women of reproductive age** | | | | | | |
| All women age 15-49[4] | 3.37 | 3.12-3.61 | 1187 | 4.50 | 4.32-4.68 | 853 |
| Zanzibar[4] | 2.83 | 2.72-2.95 | 665 | 3.70 | 3.50-3.90 | 465 |
| Mainland[4] | 3.43 | 3.16-3.70 | 522 | 4.59 | 4.40-4.79 | 388 |
| In Depth Regions[4] | 3.11 | 2.94-3.28 | 337 | 4.64 | 4.36-4.93 | 238 |
| **Prevalence of exclusive breastfeeding among children under 6 months of age** | | | | | | |
| All children[4] | 44.6 | 34.7-54.5 | 291 | 60.4 | 52.4-68.4 | 273 |
| Zanzibar[4] | 10.2 | 5.0-15.3 | 154 | 24.6 | 17.9-31.4 | 137 |
| Mainland[4] | 48.4 | 36.9-59.9 | 137 | 65.0 | 55.9-74.0 | 136 |
| In Depth Regions | 51.0 | 39.8-62.1 | 87 | 59.4 | 48.5-70.3 | 92 |
| **Prevalence of children 6-23 months receiving a minimum acceptable diet[3]** | | | | | | |
| All children | n/a | n/a | n/a | 7.2 | 5.0-9.5 | 891 |
| Zanzibar | n/a | n/a | n/a | 11.6 | 7.1-16.1 | 461 |
| Mainland | n/a | n/a | n/a | 6.6 | 4.1-9.1 | 430 |
| In Depth Regions | n/a | n/a | n/a | 6.1 | 3.3-8.8 | 277 |
| All breastfed children[4] | 15.3 | 11.2-19.3 | 726 | 8.0 | 5.4-10.5 | 745 |
| Zanzibar[4] | 7.0 | 4.5-9.5 | 411 | 13.0 | 8.2-17.9 | 383 |
| Mainland[4] | 16.3 | 11.7-20.9 | 315 | 7.3 | 4.4-10.1 | 362 |
| In Depth Regions[4] | 15.1 | 9.7-20.6 | 200 | 6.7 | 3.7-9.6 | 238 |

| Feed the Future indicator | Baseline (2010 11) | | | Interim (2014 16) | | |
|---|---|---|---|---|---|---|
| | Estimate | 95% CI[1] | n | Estimate | 95% CI | n |
| **Prevalence of underweight women** | | | | | | |
| All non-pregnant women age 15-49[4] | 10.5 | 8.9-12.1 | 3708 | 8.3 | 7.2-9.5 | 3629 |
| Zanzibar | 13.7 | 11.8-15.6 | 2190 | 11.8 | 10.3-13.4 | 1955 |
| Mainland[4] | 10.0 | 8.2-11.8 | 1518 | 7.8 | 6.5-9.1 | 1674 |
| In Depth Regions[4] | 14.9 | 11.9-17.9 | 899 | 9.7 | 7.8-11.6 | 1022 |
| **Prevalence of stunted children under 5 years of age** | | | | | | |
| All children[4] | 48.3 | 44.3-52.2 | 2784 | 35.2 | 32.2-38.3 | 2851 |
| Zanzibar[4] | 30.1 | 26.8-33.4 | 1526 | 23.0 | 20.0-26.1 | 1526 |
| Mainland[4] | 50.5 | 46.0-54.9 | 1258 | 37.0 | 33.6-40.4 | 1325 |
| In Depth Regions[4] | 50.4 | 45.5-55.3 | 796 | 35.8 | 31.9-39.8 | 859 |
| **Prevalence of wasted children under 5 years of age** | | | | | | |
| All children | 4.7 | 3.6-5.8 | 2784 | 5.3 | 4.1-6.5 | 2851 |
| Zanzibar[4] | 10.7 | 9.1-12.3 | 1526 | 6.8 | 5.3-8.2 | 1526 |
| Mainland | 4.0 | 2.8-5.2 | 1258 | 5.1 | 3.7-6.5 | 1325 |
| In Depth Regions | 5.3 | 3.6-7.0 | 796 | 5.6 | 3.6-7.5 | 859 |
| **Prevalence of underweight children under 5 years of age** | | | | | | |
| All children[4] | 18.7 | 16.0-21.4 | 2784 | 13.5 | 11.5-15.5 | 2851 |
| Zanzibar[4] | 19.2 | 16.7-21.7 | 1526 | 13.2 | 11.0-15.4 | 1526 |
| Mainland[4] | 18.6 | 15.6-21.6 | 1258 | 13.5 | 11.3-15.8 | 1325 |
| In Depth Regions[4] | 22.5 | 19.0-26.1 | 796 | 14.6 | 11.5-17.6 | 859 |
| **Prevalence of anemia in women** | | | | | | |
| All non-pregnant women age 15-49 | 36.1 | 32.4-39.7 | 3996 | 36.9 | 34.5-39.3 | 3927 |
| Zanzibar | 58.7 | 56.2-61.2 | 2362 | 60.1 | 57.2-63.1 | 2116 |
| Mainland | 32.8 | 28.6-37.1 | 1634 | 33.4 | 30.7-36.1 | 1811 |
| In Depth Regions | 35.0 | 29.6-40.4 | 972 | 38.6 | 35.0-42.2 | 1103 |
| **Prevalence of anemia in children under 5 years of age** | | | | | | |
| All children | 53.4 | 49.9-56.8 | 2565 | 55.5 | 52.0-58.9 | 2601 |
| Zanzibar | 68.6 | 65.6-71.5 | 1407 | 64.7 | 61.2-68.3 | 1399 |
| Mainland | 51.5 | 47.6-55.5 | 1158 | 54.2 | 50.2-58.1 | 1202 |
| In Depth Regions | 52.0 | 47.1-57.0 | 730 | 55.6 | 49.9-61.3 | 769 |
| **WEAI Score[2]** | | | | | | |
| | n/a | n/a | n/a | .92 | n/a | n/a |

Source(s): Daily per capita expenditures, prevalence and depth of poverty are all from 2010/11 and 2014/15 Tanzania NPS. Prevalence of exclusive breastfeeding, children receiving a minimum acceptable diet, underweight women, stunted, wasted, and underweight children are from the 2010/11 and 2015/16 Tanzania DHS. Prevalence of hunger and WEAI indices are from 2015 Feed the Future ISS. Women's dietary diversity is from the 2010/11 Tanzania DHS for the baseline and from 2016 Feed the Future ISS for the Interim.
n/a – Not available

[1] Confidence intervals (CIs) demonstrate the reliability of estimated values. Non-overlapping CIs do indicate significant differences between the two estimates. However, if CIs do overlap, the reader cannot conclude whether there is or is not a significant difference between baseline and interim estimates. An adjusted Wald test of the null hypothesis that the baseline and interim indicator means are equivalent was run for each indicator.

[2] The WEAI score reported in this table uses the original adequacy thresholds. Please refer to the WEAI section of the report for more details.

[3] A minimum acceptable diet (MAD) for children 6-23 months of age measures both the minimum feeding frequency and the minimum dietary diversity, as appropriate for both breastfed and non-breastfed children as well as for different age groups. The measure for breastfed children is straightforward, and involves counting the number of food groups consumed as well as the number of solid feedings over the last 24 hours. The measure for non-breastfed children differs slightly from that for breastfed children in that it does not count dairy as a food group to be

included in the dietary diversity measure, instead counting milk feeds along with solids in the feeding frequency index, and requiring that at least two of these feeds be milk feeds. The 2010/11 TDHS does not include the number of milk feeds over the last 24 hours in its questionnaire, and thus cannot be used to generate prevalence of MAD for non-breastfed children

[4] These indicators are significantly different across survey years, from baseline to interim.

# 1. Background

Feed the Future is a U.S. Government (USG) initiative that addresses global hunger and food insecurity by supporting agriculture sector growth and improving nutritional status in 19 focus countries. The U.S. Agency for International Development (USAID) is responsible for leading the effort to implement the Feed the Future initiative, working with host country governments, civil society, and private sector partners to address the needs of smallholder farmers and agribusinesses. Feed the Future emphasizes the empowerment of women, enables strong agricultural markets, promotes research and innovation for agricultural development, and increases investments in nutrition, while maintaining the US government's support for humanitarian food assistance.[2]

In order to understand the development situation in the area of Feed the Future interventions and to measure progress in addressing global food insecurity, USAID either utilizes secondary data or collects baseline data through large scale household surveys in targeted geographic areas, known as the Zones of Influence (ZOI). The baseline established starting points by which progress can be measured. These population-based surveys (PBS) captured information related to agriculture, food security, food consumption, nutrition, women's empowerment, and well-being of households in the ZOI.

This first interim assessment follows the baseline and will provide the USG interagency partners, USAID Bureau for Food Security (BFS), USAID Missions, host country governments, and development partners with information about short-term progress of the ZOI indicators. The assessment is designed for use as a monitoring tool, and as such provides point estimates of the indicators with an acceptable level of statistical precision. However, Feed the Future ZOI sample calculations are not designed to support conclusions of causality or program attribution.

This section provides background information on Feed the Future in Tanzania, including a description of the program and the Zone of Influence (ZOI), demographic information on the ZOI population, and a summary of the agriculture situation in the ZOI.

## 1.1 Feed the Future Overview

*Challenges facing Tanzania*

Tanzania is a democratic republic of approximately 48 million people in 2015, with a high average annual population growth rate of 2.7%, translating to an additional 1.2 million inhabitants per year.[3] The high population growth rate is caused by high fertility and declining mortality. The labor force was 15.5 million in 2001, 24.1 million in 2012, and estimated to be

[2] USAID. 2013a.
[3] NBS 2013; Economic and Social Research Foundation et. al, 2015.

almost 26 million in 2015.[4] While urbanization is increasing, the population is still largely rural and dispersed (6% urban in 1967, 30% urban in 2012).[5]

Tanzania exhibits strong and stable economic growth relative to other African countries, with an average annual GDP growth rate of 6-7 percent over the past decade. However, this economic growth is driven by productivity gains in tourism, financial services, construction, trade and mining, which are largely urban or capital intensive and have not been accompanied by an expansion of job opportunities.

In contrast, the rate of growth in the rural and labor intensive agricultural sector is lower than other sectors and declining, from 4.5% in 2001 to 3.7% in 2010 and 2.2% annual growth in 2015. The agricultural sector, the mainstay of the rural economy, provides livelihoods for 80% of the population, employs 66 percent of the labor force, and accounts for 29 percent of the GDP in 2015.[6] Even so, Tanzania is a net importer of rice and still faces shortfalls in maize production in some years due to weather variability and low yields. Climate change impacts could pose serious threats to subsistence farmers, including prolonged drought as well as extreme and unpredictable weather events.

The relative low productivity and growth of agriculture might explain the relatively slow decline in rural poverty, even amidst solid national economic growth. The Household Budgetary Survey measures that between 2007 and 2012, the percentage of people living below the basic needs poverty line on the Tanzania mainland decreased by only 6 percentage points, from 33.3 to 28.2 percent. Basic needs poverty on Zanzibar was measured to be 49% in 2005 and 44.4% in 2010.[7] The national poverty rate, as defined by the international per capita poverty line of $1.25/day (2005 PPP) and measured by the National Panel Survey, was 40 percent in 2010, declining to only 37% in 2015. The poverty level and direction of change varies greatly over strata defined by urban/rural, mainland/Zanzibar. Mainland rural Tanzania had a poverty rate of 49.6% in 2010, declining only to 47.6% in 2015. Zanzibar's poverty rate was lower and showed greater decline, at 34% in 2010 and 27.8% in 2015. Dar es Salaam had a much lower yet increasing poverty rate: 2.8% in 2010 and 3.4% in 2015. Poverty in other mainland urban areas was 19.7% in 2010 going down only to 18.1% in 2015.[8] In 2012, the average per capita income placed Tanzania in 176$^{th}$ position out of 191 countries in the world.[9]

Tanzania has low levels of human development. Tanzania ranked 159/187 countries on the 2014 Human Development Index (HDI), which is an aggregate of life expectancy, education, and

[4] Economic and Social Research Foundation et. al., 2015. Estimation using exponential growth rate calculation.
[5] MoHCDGEC et. al., 2016.
[6] Economic and Social Research Foundation et. al. 2015. CountryStat, 2017. NBS 2017. The World Bank Group, 2017a, puts agricultural GDP at 22% in 2015. Feed the Future Tanzania Country page cites agriculture has 31.5% share of GDP.
[7] Economic and Social Research Foundation, et. al., 2015.
[8] Measured using national level data from TZNPS 2010/11 and TZNPS 2014/15.
[9] The World Bank. 2015.

income. This was a decline by 7 positions from the previous year.[10] Another measure of human development in Tanzania is the Multidimensional Poverty Index (MPI), which measures the extent to which individuals are deprived in three areas: education (years schooling, attendance), health (child mortality and nutrition), and standard of living (cooking fuel, sanitation, water, electricity, floor material, and asset ownership). By this measure, the incidence of poverty (or incidence of deprivation) is calculated to be 64% on the Tanzania mainland and 43.3% on Zanzibar.[11]

A key factor undermining Tanzania's progress towards economic growth and poverty reduction is widespread chronic undernutrition, or stunting, which affected one third of children under five nationwide in 2015.[12] Undernutrition diminishes the ability of children to grow, learn, and earn income as adults and thus contribute to the economy. It is caused primarily by inadequate access to a diverse and quality diet and poor caring and feeding practices at the household level. Caloric availability in households has not improved since 1997.[13] Undernutrition costs Tanzania 2.65% of its GDP, due to lost revenues mainly in the agriculture sector attributable to poor cognitive and physical development.[14] It causes over one third of mortality in children under age 5.[15]

*Opportunities and Political Context*

Despite the challenges, the opportunities are great for Tanzania to reduce poverty and hunger by increasing incomes through equitable agricultural growth and improving nutrition. Tanzania, a country abundant in land, water resources, motivated agricultural laborers and entrepreneurs, and access to international markets through a major port, has been described as a sleeping agricultural giant. The climate is generally favorable for many crops, and with increased irrigation and improved seeds, productivity and yields could rapidly increase.

The Tanzanian government, private sector, and civil society have demonstrated a sustained commitment to realize the potential of agriculture for Tanzania. The Government of Tanzania's (GOT) 2006-2015 Agricultural Sector Development Program (ASDP) is part of the broader National Strategy for Growth and Poverty Reduction (MKUKUTA). A private sector initiative to invigorate agriculture through the Kilimo Kwanza (Agriculture First) campaign has been endorsed by the government as well.[16]

One element of the Tanzanian plan includes strategic investments in the Southern Agricultural Growth Corridor of Tanzania (SAGCOT), a public-private partnership which aims to boost agricultural competitiveness in Tanzania by aligning investment in agriculture with existing

[10] Economic and Social Research Foundation et. al. 2015.
[11] Economic and Social Research Foundation et. al. 2015.
[12] Calculated using TDHS 2015/16 data.
[13] Economic and Social Research Foundation et. al. 2015.
[14] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy.
[15] Economic and Social Research Foundation et. al. 2015.
[16] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy.

infrastructure from the port of Dar es Salaam through the central and southern parts of the country to Zambia. The partnership is being led by numerous Tanzanian private sector companies represented by their umbrella organization, the Agriculture Council of Tanzania. More than 80 percent of Feed the Future investments will be located in the corridor.[17]

Regionally, the Comprehensive Africa Agriculture Development Program (CAADP) has recommended that in order to effectively reduce poverty and food insecurity in Tanzania, growth must be broader, inclusive of value chains in which the poor participate, and targeted to reach as many poor people as possible. In addition, the analysis recommended that Tanzania should invest more in research and extension to address the underlying causes of low productivity in the pro-poor value chains such as maize, rice, and horticulture. Based on these recommendations, numerous stakeholders have been actively developing the CAADP plan, known as the Tanzania Agriculture and Food Security Implementation Plan (TAFSIP). With development of a comprehensive country-led investment plan through CAADP, conditions are ideal for Tanzania to benefit from significant increases in agricultural assistance to support scaled impact on food security, poverty, nutrition, and economic growth.[18]

Efforts are ongoing in Tanzania to reposition nutrition higher on the national policy agenda, recognizing that addressing the root causes of undernutrition would have huge potential for reducing under-five mortality, increasing work productivity and improving economic growth.[19] Tanzania is recognized as an Early Riser under the global Scaling Up Nutrition (SUN) Framework for Action, and both the National Nutrition Strategy (2010-2015) and the nutrition component of the Tanzania Agriculture and Food Security Implementation Plan (TAFSIP) provide a solid foundation from which the Government and development partners can advance a common agenda for improving nutrition.[20] National nutrition objectives have been integrated into all national development strategies, including MKUKUTA and MKUKUTA II as well as Vision 2025 (described below).[21]

Most recently, the Government of Tanzania has developed a long term development vision (Vision 2025), which lays out three comprehensive Five Year Development Plans (FYDP) meant to transform Tanzania into a middle income country by 2025. The first of these, from 2011-2016, eliminates constraints to inclusive economic growth and poverty reduction. This involves relieving infrastructure bottlenecks in energy, ports, and transportation. It also includes the development of skilled labor in science, technology, information and communications, and business. Finally, and most relevant to Feed the Future Tanzania, the first FYDP outlines a plan to intensify agriculture through increased use of technology, irrigation, and inputs, thus

[17] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy.
[18] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy.
[19] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy.
[20] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy.
[21] MoHCDGEC et. al, 2016.

improving agricultural labor productivity, increasing agricultural incomes, and eventually freeing a portion of agricultural labor to participate in higher income generating sectors. The second FYDP (2016-2021) transitions a large portion of the labor force to the employment and revenue generating industrial sector, including natural gas extraction and agro processing. This stage involves an increase in public social investments and further development of human capital. The third FYDP (2021-2025) includes increasing competitiveness and consolidating gains in all sectors, especially manufacturing and services, and focusing on export oriented growth.[22]

*Feed the Future Goals and Objectives*

Tanzania Feed the Future (Feed the Future) is an initiative of the U.S. Government in Tanzania with the main goal of reducing poverty and hunger via investments made in cooperation with various public and private partners. Under this main goal are two First-Level Objectives: (1) Inclusive Agriculture Sector Growth, and (2) Improved Nutritional Status, especially of Women and Children.[23]

In Tanzania, these First-Level Objectives have eight corresponding and supporting secondary objectives:

1. Improved agricultural productivity, including increasing yield of target crops by 50%
2. Improved markets and market access through road improvements
3. Increased investment in agriculture and nutrition-related activities
4. Increased agricultural value chain on- and off-farm jobs
5. Increased resilience of vulnerable communities and households
6. Improved access to diverse and quality foods
7. Improved nutrition-related behaviors
8. Improved use of maternal and child health and nutrition services.[24]

The Feed the Future Tanzania Results Framework, seen in Figure 1, outlines the goals, primary and secondary objectives of Tanzania Feed the Future, along with indicators to be used to monitor and evaluate progress towards achieving these goals and objectives. It was formulated as part of USAID/Tanzania's multi-year strategy (MYS) for Feed the Future, a five-year plan that aims to increase food security at the household level by increasing productivity, trade, and

[22] Economic and Social Research Foundation et. al. 2015.
[23] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy
[24] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy

household income while reducing malnutrition in young children and women of reproductive age.[25]

Measuring achievement of Feed the Future's main goal of poverty reduction and two primary objectives of agricultural sector growth and improved nutritional status are a reduction in both prevalence of poverty and prevalence of stunting in Feed the Future target regions by 20% over the period 2010-2017.[26]

*Feed the Future Strategic Choices and Program Highlights*[27]

Within this dynamic context, the U.S. Government (USG) commitments through Feed the Future are designed to complement the work of other actors and make a significant impact through areas of comparative advantage for the USG. The core Feed the Future investments are made in areas where the USG can play the role of superconductor to advance systemic change through innovative public and private partnerships:

1. **Value Chain Approach.** Feed the Future is having an impact at scale with focused efforts in areas that offer opportunities to catalyze investment in agriculture. Feed the Future targets investments in the rice, maize, and horticulture value chains based on their potential to drive growth and improve incomes and nutrition.

    a. Feed the Future is providing access to improved agricultural inputs and farm management techniques, irrigation, and road infrastructure to help Tanzania meet the growing demand for rice in domestic and regional markets

    b. Feed the Future is promoting improved technologies and inputs for maize farmers and improving milling, which has the potential to improve nutrition through fortification.

    c. Through investments in horticulture, Feed the Future is expanding economic opportunities while enhancing health and nutrition.

2. **Policy.** Feed the Future is enabling data collection and management, facilitating stakeholder engagement, strengthening government capacity to advance policy actions, and completing policy analysis on key constraints to agricultural growth as envisioned by government-led initiatives such as the Southern Agricultural Growth Corridor of Tanzania (SAGCOT). As a result of Feed the Future analysis, the Government of Tanzania has made commitments in its New Alliance Cooperation Framework to alleviate longstanding policy constraints related to trade, taxes, land, and inputs. In collaboration with the Food and Agriculture Organization of the United Nations, Feed the

[25] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy.
[26] Feed the Future, 2017.
[27] Program highlights have been copied verbatim from Feed the Future Tanzania Country Profile, accessed June 2017.

Future is strengthening the agricultural statistics system in Tanzania by building the capacity of Tanzanian institutions to implement an annual agricultural survey.

3. **Nutrition.** Building on the Tanzanian National Nutrition Strategy, Feed the Future is delivering nutrition-specific interventions and implementing social and behavior change programs that bolster nutrition in the critical 1,000-day window between pregnancy and a child's second birthday. Feed the Future integrates nutrition throughout its agriculture programs with the aim of improving families' access to and consumption of nutritious foods by:

    - Promoting micronutrient fortification
    - Reducing postharvest losses
    - Introducing biofortified crops
    - Tackling constraints in the horticulture value chain
    - Promoting social and behavior change communication and the formation of peer support groups to increase knowledge about nutrition
    - Boosting dietary diversity with home gardens and small farm animals

4. **Gender Integration.** As key participants in staple value chains, women contribute significantly to all facets of food production, including processing and marketing activities. Feed the Future projects in Tanzania build capacity and enable women to participate in economic opportunities throughout value chains. Investments aim to strengthen women's participation and leadership in farming organizations. Gender equity is also integrated into policies to ensure that women have access to land and other property.

5. **Private Sector Engagement.** Feed the Future supports the SAGCOT Center, a public-private partnership that aims to boost agricultural competitiveness and aligns investments in agriculture with existing infrastructure in the southern transportation corridor. SAGCOT is both a center that helps leverage private sector investment and a region identified by Tanzania as an area ripe for agricultural development. More than 80 percent of Feed the Future investments are targeted in this corridor. The SAGCOT Center promotes "clusters" of profitable agricultural farming and services businesses, with major benefits for smallholder farmers and local communities. The SAGCOT Center partnership includes numerous Tanzanian and international companies.

6. **Research, Technology, and Innovation.** Feed the Future is working with the Tanzanian National Agricultural Research Services and Sokoine University of Agriculture on research to improve agricultural productivity, especially in light of climate, agronomic,

and economic constraints. In Tanzania, Feed the Future supports post-graduate students in agriculture- and nutrition-related fields to build the capacity of future agriculture specialists in the country. Feed the Future is also collaborating with the Government of Tanzania and other development partners to strengthen the collection of core agricultural statistics, governance policies, trade, and legal issues related to agricultural inputs, credit, markets, and land.

7. **Rural Infrastructure.** Feed the Future is enhancing agricultural productivity through the expansion and rehabilitation of irrigation. Feed the Future is also helping farmers access markets by improving strategic feeder roads to reduce transport costs for farm inputs and products, thereby increasing Tanzania's competitiveness in domestic and regional markets. The Government of Tanzania is leveraging considerable local capacity to oversee and implement this work.

8. **Scaling Innovations.** Feed the Future aims to increase rice and maize yields by 50 percent by scaling new technologies and practices in target regions in Tanzania. Feed the Future is also scaling fortification of maize flour, which can improve nutrition.

*Feed the Future Key Achievements*[28]

Key Achievements

- Feed the Future expanded its rice and maize efforts to 117 villages, supported 648 demonstration plots in rice and maize, and added 56 producer associations to its network in 2015. As a result of strategic collaboration with producers, farmers, and associations, 116,000 hectares of rice in Tanzania are being tended with improved technologies and practices, and average gross margins for rice increased by 15 percent over the 2013 baseline.

- The U.S. Government provided $2.9 million to the Tanzania National Roads Agency for the design and upgrade of the approximately 100-kilometer Mikumi-Ifakara Regional Road and 55 kilometers of the Ifakara-Mlimba Regional Road. These two roads form the principal transportation artery serving the Kilombero Valley, a major rice producing region.

- Feed the Future scaled the delivery of community and facility-based nutrition services through health and agriculture sector platforms. One program expanded activities to reach 90 percent of the targeted population in the three regions in which it works and trained more than 14,000 community leaders, extension workers, and local government staff on nutrition topics, including dietary diversity strategies, home

[28] Results and achievements have been copied verbatim from Feed the Future Tanzania Country Profile, accessed June 2017

gardening, exclusive breastfeeding, appropriate complementary feeding, and iron-folate supplementation for pregnant mothers.

## 1.2 Feed the Future ZOI Profile

Tanzania is divided into 25 mainland administrative regions and 5 administrative regions on the archipelago of Zanzibar. Of major importance in defining Tanzania's Feed the Future ZOI is the SAGCOT, which stretches from the capital and port of Dar es Salaam through the central and southern parts of the country to Zambia and encompasses significant portions of the Zone of Influence.

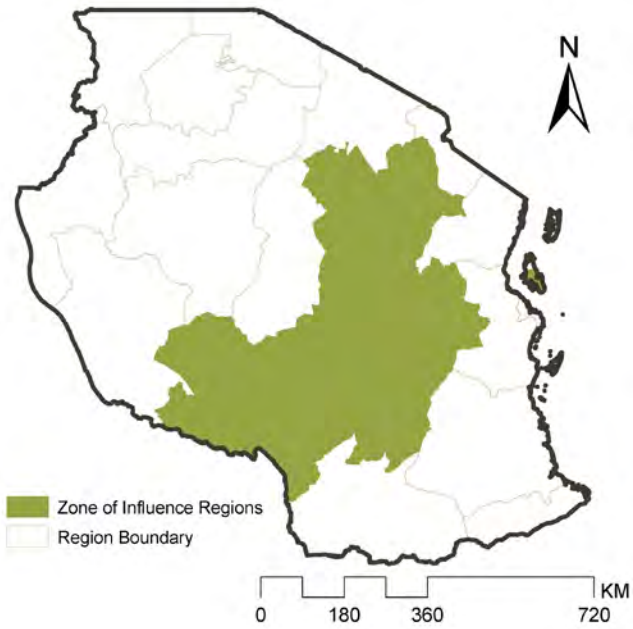
The Feed the Future ZOI in Tanzania includes both urban and rural populations in the mainland regions of Dodoma, Manyara, Morogoro, Mbeya and Iringa, and the islands of Zanzibar. The three regions of Dodoma, Manyara, and Morogoro received more concentrated Feed the Future interventions than the other regions and are known as "in-depth regions."

All of the mainland ZOI regions are considered to have low human development as defined in the 2014 Human Development Report. However, they vary in human development as well as income and rurality. Iringa and Mbeya have HDI scores in the upper tercile of all Tanzania mainland regions, while Dodoma has an HDI score in the lowest tercile. Likewise, Iringa and Mbeya have lower incidence of deprivation than all of mainland Tanzania as measured by MPI, while Dodoma has the highest regional incidence of deprivation nationwide. Iringa and Mbeya have relatively high GDP per capita while Dodoma has low GDP per capita. Manyara and Morogoro are in the middle on all three measures.[29] Mbeya has the lowest proportion of rural population at 62%, while Manyara and Dodoma have the highest proportion of rural population, ranging from 84-86%.[30]

A map of the Feed the Future ZOI in Tanzania is provided in Figure 1.2.

[29] Economic and Social Research Foundation et. al. 2015.
[30] NBS 2013.

*Figure 1.2. Map of Tanzania: Feed the Future ZOI*




### 1.2.1 Rationale for ZOI Selection

The five mainland regions and Zanzibar were selected to be in the ZOI for their agricultural growth potential and opportunity for reducing undernutrition and poverty. The areas were prioritized by GOT and private investors and have been able to leverage complementary investments from other donors. They are within close proximity of transport corridors for market access and impact on nearby food insecure areas. Finally, the water resources and climatic conditions are appropriate for selected value chains.[31]

Morogoro and Zanzibar are the focus of irrigated rice production, while maize value chains are promoted in Dodoma and Manyara regions. Horticulture value chains are the focus in the central (Morogoro), northern (Manyara), and southern highland regions (Iringa and Mbeya), as well as Zanzibar. Dodoma, Manyara, and Morogoro are the primary regions of focus for nutrition-related interventions in addition to agricultural value chain interventions, while Iringa, Mbeya, and Zanzibar receive agricultural interventions alone.[32]

[31] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy.
[32] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy.

**Tanzania Feed the Future Targeted Interventions in ZOI**

| Intervention | Region |
|---|---|
| Rice value chain | Morogoro, Zanzibar |
| Maize value chain | Dodoma, Manyara |
| Horticulture value chain | Morogoro, Manyara, Iringa, Mbeya, Zanzibar |
| Nutrition | Dodoma, Manyara, Morogoro |

### 1.2.2 Demography of the ZOI

The ZOI includes approximately 11.6 million people in 2015, representing 24 percent of the total population. The ZOI population has an average annual growth rate of 2.6 percent between 2002 and 2012. This ranges from 0.1-3.2 percent growth in the rural areas of each region and from 3.2-7.6 percent growth in the urban areas of each region.[33]

**Tables 1.2.2 and 1.2.3** present individual and household population estimates, respectively, for the ZOI for 2015. Estimates of the total population as well as sub-populations of the ZOI are presented. The sub-population categories correspond to the various sub-populations for the Feed the Future indicators and disaggregates (e.g., children age 6-23 months, number of households). The ZOI estimates for the total population of individuals as well as households are also disaggregated by gendered household type.[34]

The 2015 population estimates are based on the last two national level censuses conducted in 2002 and 2012 by Tanzania National Bureau of Statistics (NBS). Where possible, intercensal population growth rates for specific subsets of the population were calculated for this period. This included growth rates calculated separately for each region as well as rural and urban areas of each region. It also included national level growth rates for women of reproductive age, children 0-59 months, female youth aged 15-29 years, and male youth 15-29 yrs. These 2002-2012 growth rates were used to estimate populations for each subset in 2015. Proportions of children disaggregated further by age (0-5 months, 6-23 months, 6-59 months), reproductive age women disaggregated by pregnancy, and gendered household type were calculated for the ZOI using proportions from the Tanzania DHS 2015-2016 and then applied to the estimated 2015 population. Likewise, a growth rate for number of households was calculated for the intercensal period 2002-2012. Proportion of gendered household type was calculated for the ZOI using the Tanzania DHS 2015-2016. This proportion was applied to the estimated 2015 number of households to impute number of households in 2015 for each gendered household type.

[33] NBS 2006, 2013.
[34] See Section 2.2.1 Standard Disaggregates for the definition of gendered household type.

*Table 1.2.2 Population of individuals, by category, in the ZOI, Tanzania 2015*

| Category of individuals | Estimated population |
|---|---|
| **Total population** | **11,566,811** |
| **Total population, by sub-population** | |
| Women of reproductive age (15-49 years) | 2,799,901 |
| Children 0-59 months | 1,792,438 |
| Children 0-5 months | 163,687 |
| Children 6-23 months | 581,652 |
| Children 6-59 months | 1,628,751 |
| Youth 15-29 years | 3,007,179 |
| **Total population, by area type** | |
| Mainland Urban | 2,694,008 |
| Mainland Rural | 7,448,338 |
| Zanzibar Urban | 689,028 |
| Zanzibar Rural | 735,437 |
| **Total population, by gendered household type** | |
| Male and female adult(s) | 10,113,717 |
| Female adult(s) only | 1,163,348 |
| Male adult(s) only | 288,500 |
| Child(ren) only (no adults) | 1,246 |
| **Women of reproductive age, by pregnancy status** | |
| Pregnant | 221,879 |
| Non-pregnant | 2,578,022 |
| **Children 0-59 months, by child sex** | |
| Male | 882,162 |
| Female | 910,276 |
| **Children 0-5 months, by child sex** | |
| Male | 78,095 |
| Female | 85,592 |
| **Children 6-23 months, by child sex** | |
| Male | 283,641 |
| Female | 298,011 |
| **Children 6-59 months, by child sex** | |
| Male | 804,067 |
| Female | 824,684 |
| **Youth 15-29 years, by sex** | |
| Male | 1,421,944 |
| Female | 1,585,235 |

Source: National Bureau of Statistics, Tanzania (NBS 2006, 2013, & 2013a). The last two national level censuses were conducted in 2002 and 2012. Where possible, intercensal population growth rates for specific subsets of the population were calculated for this period. This included growth rates calculated separately for each region as well as rural and urban areas of each region. It also included national level growth rates for women of reproductive age, children 0-59 months, female youth aged 15-29 years and male youth 15-29 yrs. These growth rates were used to estimate populations for each subset in 2015. Proportions of children disaggregated further by age (0-5 months, 6-23 months, 6-59 months), reproductive age women disaggregated by pregnancy, and gendered household type were calculated for the ZOI using proportions calculated from the Tanzania DHS 2015-2016 and then applied to the estimated 2015 population.

*Table 1.2.3 Number of households, by category, in the ZOI, Tanzania 2015*

| Category of households | Estimated population |
|---|---|
| **Total number of households in ZOI** | **2,548,225** |
| **Number of households, by gendered household type** | |
| Male and female adult(s) | 1,962,480 |
| Female adult(s) only | 387,165 |
| Male adult(s) only | 197,914 |
| Child(ren) only, (no adults) | 666 |

Source: Source: National Bureau of Statistics, Tanzania (NBS 2006, 2013, & 2013a). A growth rates for number of households was calculated for the intercensal period 2002-2012. Proportion of gendered household type was calculated for the ZOI using the Tanzania DHS 2015-2016. This proportion was applied to the estimated 2015 number of households to impute number of households in 2015 for each gendered household type.

### 1.2.3 Agriculture in the ZOI

Agriculture is the foundation of the Tanzanian economy as a source of livelihood for 80% of the population. The agricultural sector includes crop production, livestock, fisheries, and forests. The main staple crops are maize, rice paddy, beans, cassava, potatoes, sweet potatoes, and sorghum. Almost seven in 10 households cultivate land. Poverty and agriculture are closely linked in Tanzania, with poverty rates among land cultivators six times higher than for the rest of the population. Despite an abundance of arable land and water resources, small scale subsistence farmers dominate the sector, with 84% of the farmers owning less than 4 hectares of land. These smallholders depend primarily on family labor. Just one-third of farmers sell some of their production, and the export of cash crops has declined from 6.7% of the GDP in 1996 to only 2.8% of the GDP in 2010.

The main limitation to increasing productivity is limited adoption of mechanized and modern farming technologies, including irrigation. Of the 44 million hectares suitable for agriculture in Tanzania, 29.4 million hectares are suitable for irrigation, but only 0.39 million hectares are actually under irrigation.[35] Agriculture in Tanzania is still largely dependent on rainfall. The NPS shows that the use of irrigation measured both as a share of households and share of fields using irrigation remains very low at 3.1 and 2.0 percent respectively. This holds true for maize (1.4 percent) and rice (2.1 percent). It has declined or remained the same since 2008/9.[36]

Another illustrative example is the use of fertilizer; Tanzanian farmers use an average 9 kg/ha of fertilizer, while farmers in Malawi use 27 kg/ha fertilizer, and farmers in China use 279 kg/ha fertilizer.[37] The NPS shows that the use of fertilizer as well as insecticides and pesticides decreased in 2014/5 relative to previous years. The only input which increased in use is

[35] Economic and Social Research Foundation, et. al., 2015, NBS 2017.
[36] NBS 2017.
[37] Economic and Social Research Foundation et. al. 2015.

improved seeds, up from 18 percent in 2010/11 to 44 percent in 2015. The majority of households use hand hoes for cultivation (97.9 percent), which has remained roughly the same between 2008/9 and 2014/15. The use of animal traction increased slightly in 2014/15, to about one-third of households. The use of other forms of agricultural mechanization remained low, limiting agricultural productivity and expansion.[38]

*Targeted Agricultural Value Chains*

Feed the Future will have the highest impact with focused interventions in areas that offer opportunities to reduce poverty and undernutrition. Selection of agricultural value chains was based on analysis of potential to improve incomes and nutrition, prioritization by the country, and complementary interventions by other actors.[39]

Rice was selected as the primary value chain for investment. Regional analysis shows that Tanzania has a comparative advantage in rice production. It is the second most important food consumed and has been increasing as a proportion of the Tanzanian diet. As such, increasing production can potentially satisfy regional market demand. Since nearly 1 in 5 farmers are involved in rice production, advances in this value chain can support broad-based growth. Irrigation is the focus of investment in the rice value chain, as both financial and economic returns to investment in irrigation are extremely positive.[40]

Maize was selected as a secondary value chain. It is the most important food item in terms of consumption in the Tanzanian diet. Nearly two-thirds of Tanzanian farmers are engaged in maize production, so broad pro-poor growth can be achieved by targeting this value chain. The milling process offers opportunities to fortify food for improved nutritional content, simultaneously enhancing the capacity of medium private sector milling enterprises.[41]

Findings from the four National Panel Surveys (NPS) conducted from 2008/9 to 2014/15 show that production of both maize and rice paddy are highest in NPS 2014/15 (5 million and 1.4 million metric tons, respectively) and that the production of maize is higher than the production of paddy in all rounds. Yields of maize are highest in 2014/15 when compared to other rounds, at 1,064 kg/ha. This is also true of rice paddy (1,742 kg/ha), with the exception of plots with organic fertilizer.[42]

Horticulture is another secondary value chain of focus. Experiencing 6-10% growth per annum, horticulture offers the opportunity for increased income through meeting demand in domestic, regional, and international markets, as well as playing an important role in improving nutrition

[38] NPS 2017.
[39] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy.
[40] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy.
[41] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy.
[42] NBS 2017.

through dietary diversity. Women are highly engaged in this value chain, such that further developing this value chain also offers opportunities to address gender inequality.[43]

*Gender considerations*

While horticulture is considered a women's domain in Tanzania, women contribute significantly to all food production, processing, and marketing activities and are key participants in all staple value chains. Women are the main source of farm labor, yet they have limited participation in decision making and benefit little from the downstream portion of value chain activities such as warehouse receipt system, marketing, processing, and trade. There is also gender inequality in access to productive resources (particularly land and water resources and agricultural inputs such as improved seed and fertilizer) and to training and leadership opportunities.[44]

Gender inequalities limit the growth potential of Tanzania. If Feed the Future is to achieve its objectives of increasing agricultural growth, reducing poverty, and improving nutritional status, explicit and specific attention to gender, particularly women's access to land, water, information, credit, technology, training, and leadership opportunities will be essential. Feed the Future will promote gender equitable market facilitation by promoting women's access to membership and leadership positions in relevant organizations and ensuring that they have access to the productive assets they need as well as financial resources.[45]

## 1.3 Purpose of This Report

The purpose of this interim assessment is to provide the United States Government interagency partners, USAID BFS, USAID Missions, host country governments, and development partners with information about the current status of the ZOI indicators. The assessment is designed for use as a monitoring tool, and as such provides point estimates of the indicators with an acceptable level of statistical precision. However, Feed the Future ZOI sample calculations are not designed to support conclusions of causality or program attribution, nor is the interim assessment designed to measure change from the baseline with statistical precision.

[43] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy.
[44] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy.
[45] USAID. 2011. Feed the Future Tanzania FY 2011-2015 Multi Year Strategy.

# 2. Methodologies for Obtaining Interim Values for Feed the Future Indicators

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

## 2.1 Data Sources

**Table 2.1** presents the data sources and dates of data collection for the baseline and interim Feed the Future indicators.

***Table 2.1. Data sources and dates of the Baseline and Interim Feed the Future indicators***

| | Baseline | | Interim | |
|---|---|---|---|---|
| Indicator | Data source | Date collected | Data source | Date collected |
| Daily per capita expenditures (as a proxy for income) in USG-assisted areas | TNPS | 10/2010-9/2011 | TNPS | 10/2014-11/2015 |
| Prevalence of Poverty: Percent of people living on less than $1.25 per day | TNPS | 10/2010-9/2011 | TNPS | 10/2014-11/2015 |
| Depth of Poverty: Mean percent shortfall relative to the $1.25 per day poverty line | TNPS | 10/2010-9/2011 | TNPS | 10/2014-11/2015 |
| Women's Empowerment in Agriculture Index indicators | n/a | n/a | FTFISS | 5-7/2016 |
| Prevalence of households with moderate or severe hunger | n/a | n/a | FTFISS | 5-7/2016 |
| Women's Dietary Diversity: Mean number of food groups consumed by women of reproductive age | TDHS | 12/2009-5/2010 | FTFISS | 5-7/2016 |
| Prevalence of exclusive breastfeeding among children under 6 months of age | TDHS | 12/2009-5/2010 | TDHS | 8/2015-2/2016 |
| Prevalence of children 6-23 months receiving a minimum acceptable diet | TDHS | 12/2009-5/2010 | TDHS | 8/2015-2/2016 |
| Prevalence of underweight women | TDHS | 12/2009-5/2010 | TDHS | 8/2015-2/2016 |
| Prevalence of stunted children under 5 years of age | TDHS | 12/2009-5/2010 | TDHS | 8/2015-2/2016 |
| Prevalence of wasted children under 5 years of age | TDHS | 12/2009-5/2010 | TDHS | 8/2015-2/2016 |
| Prevalence of underweight children under 5 years of age | TDHS | 12/2009-5/2010 | TDHS | 8/2015-2/2016 |
| Prevalence of anemia in women | TDHS | 12/2009-5/2010 | TDHS | 8/2015-2/2016 |
| Prevalence of anemia in children under 5 years of age | TDHS | 12/2009-5/2010 | TDHS | 8/2015-2/2016 |

### 2.1.1 Primary Data: The ZOI Interim Survey in Tanzania

This section describes the ZOI interim survey, including discussion of the sample design (including targeted sample size), questionnaire customization, fieldwork, response rates, and limitations of the survey.

#### *Survey Sample Design*

The Feed the Future Interim Supplemental Survey (FTFISS) was developed to measure and elaborate on consumption habits in Tanzania and to provide a more comprehensive view of the food security situation in the country. Additionally, this project provides a valuable opportunity to expand upon food security information gathered in the Tanzania National Panel Survey (NPS), as questionnaire themes in the FTFISS were modeled to reflect those topics considered central to the comprehension of food security. To further enhance value of this expansion, only NPS households residing in the ZOI regions targeted by the Feed the Future initiative were chosen to participate in the FTFISS project. NPS households in these six regions were tracked and re-interviewed following conclusion of the 2014/2015 NPS.

The 2014/2015 NPS was the fourth round in a series of nationally representative household panel surveys that collect information on a wide range of topics including agricultural production, non-farm income generating activities, consumption expenditures, and a wealth of other socio-economic characteristics. All four rounds of the NPS were implemented by the Tanzania National Bureau of Statistics (NBS) with assistance provided by the World Bank through the Living Standards Measurement Study - Integrated Surveys on Agriculture [LSMS-ISA1] program.

For purposes of the FTFISS, a household is defined as people who live together, share the same meal, and contribute to the household income and also basic needs. In other words, residents of a household share the same center of production and consume from that center. Even those persons who are not blood relations (such as servants, lodgers, or agricultural laborers) are members of the household if they have stayed in the household at least 3 months of the past 6 months.

In cases where the household had no female members, the household was not considered eligible for the FTFISS and was not interviewed to completion. The resulting sample size of eligible households for the first FTFISS was 727 households.

#### *Questionnaire Design*

The FTFISS consists of a single survey instrument containing 11 modules, each consistent with topics examined in the Feed the Future initiative approach. Modules were furthermore designed with careful consideration to capture the intricate features of food insecurity as well as to enhance supplementation of information gathered by the NPS. A description of the FTFISS questionnaire themes as well as the targeted respondent for each module can be found below. Unlike the NPS, the targeted respondent is dependent upon the module in question.

| FTFISS QUESTIONNAIRE | | |
|---|---|---|
| **Module** | **Theme** | **Respondent** |
| Module A: | Household Identification/Survey Staff Details | Head of Household |
| Module B: | Household Member Roster | Head of Household |
| Module C: | Household Hunger Scale | Primary Person Responsible for Preparing Food |
| Module D: | Dietary Diversity | Female Household Members Ages 15-49 |
| Module E: | Role in Household Decision Making | Primary Male and Female Decision Maker |
| Module F: | Access to Productive Capital | Primary Male and Female Decision Maker |
| Module G: | Access to Credit | Primary Male and Female Decision Maker |
| Module H: | Motivation for Decision Making | Primary Male and Female Decision Maker |
| Module I: | Time Allocation | Primary Male and Female Decision Maker |
| Module J: | Time Allocation (Continued) | Primary Male and Female Decision Maker |
| Module K: | Group Membership | Primary Male and Female Decision Maker |

Modules A and B are asked of the head of household and aim to collect general identifying characteristics of the household, survey staff details, and household member roster information. While data gathered by the survey instrument are primarily structured at the household level, household member roster information is collected at the individual level, lending to greater specificity on the characteristics making up a household unit.

Module C is asked of the primary person responsible for food preparation in the household and aims to expand on the food security information gathered in the NPS by addressing frequency of both hunger and lack of food resources. Module D is asked of all female household members ages 15 to 49 and intends to examine nutrition practices in women of child-bearing ages.

The remaining modules were designed to capture information for the Women's Empowerment in Agriculture Index (WEAI), a survey-based index that measures the empowerment, agency, and inclusion of women in the agriculture sector. While the WEAI was initially developed in 2012 to measure changes resulting from the Feed the Future initiative, it is now extensively used as a general assessment tool for empowerment and gender parity in agriculture by many organizations.

Modules E through K are asked of both the primary male and female decision maker in the household. The primary male and female decision maker in the household were identified by the household members. Typically, the primary male and female decision maker is the head of household and his/her spouse, however it can be any household member age 18 or over.

### *Fieldwork*

Field staff were trained for one week in Dar es Salaam in late April 2016, while field team supervisors were trained prior to the main enumerator training. The survey instrument was piloted concurrent to training in two selected enumeration areas. After the pilots, extensive discussion and revisions were conducted with the participation of all team supervisors.

Interviewer manuals, provided in both English and Kiswahili, were developed with detailed instructions for field staff training and served as the main reference guide for the survey over the course of the fieldwork.

The survey was primarily implemented by six mobile field teams, each composed of: one supervisor, four enumerators, and one driver. Two mobile field teams were responsible for different regions on the mainland and four teams were responsible for the Zanzibar regions.

Main data collection efforts began in May 2016 and were completed in July 2016 for each of the regions on the mainland. As all efforts are made to mitigate external bias, data collection in Zanzibar was conducted only from May 2016 to June 2016 in order to account for the start of Ramadan. As the large majority of the population in Zanzibar is Muslim, the practice of fasting during Ramadan would have significantly changed the dietary patterns of the households on Zanzibar.

For this supplemental survey, only those households that moved together to another location within an hour drive from their original location ('local tracking') were tracked. Individuals who shifted more than an hour drive from their original household were not tracked. If a household split with members moving to several different locations, only the household head was tracked if he/she moved to a location that is within an hour drive from the original location. These processes differ from those practiced in the NPS where all households are tracked regardless of distance.

Data and background documentation for the FTFISS is available on the Tanzania National Bureau of Statistics website (www.nbs.go.tz), as well as the World Bank LSMS-ISA website (www.worldbank/lsms-isa), and may be downloaded free of charge. Inquiries pertaining to the data may be sent to the LSMS team at lsms@worldbank.org.

### *ZOI Interim Survey Response Rates*

**Table 2.1.1** presents the response rates for the ZOI interim survey for Tanzania. The components and the response rates for the sampled households, women of reproductive age (15-49), primary adult female decisionmakers (for the Women's Empowerment in Agriculture module), as well as children under 5 years are presented. Response rates are presented by rural/urban residence as well as for the total sample.

***Table 2.1.1 Results of the household and individual interviews for the Feed the Future Interim Supplemental Survey in the ZOI of Tanzania 2016***

| Response rates and components | Residence | | Total |
|---|---|---|---|
| | Urban | Rural | |
| **Households** | | | |
| Households selected | 351 | 446 | 797 |
| Households ineligible | 21 | 31 | 52 |
| Households interviewed | 322 | 405 | 727 |
| Household response rate[1] | 97.6 | 97.6 | 97.6 |
| **Women of reproductive age (15-49 years)** | | | |
| Number of eligible women | 476 | 422 | 898 |
| Number of eligible women interviewed | 454 | 399 | 853 |
| Eligible women response rate[2] | 95.4 | 94.5 | 95.0 |
| **Primary adult female decisionmakers (age 18+ years)** | | | |
| Number of eligible women | n/a | 404 | n/a |
| Number of eligible women interviewed | n/a | 287 | n/a |
| Primary adult female response rate[2] | n/a | 71 | n/a |

[1] Household response rates are calculated based on the result codes of Section A, the survey cover sheet, and are defined as the number of households interviewed divided by the number of households selected. The survey codes used for household survey completion were: complete, ineligible, partial, or unavailable. Households were deemed ineligible if there was no female members, and thus are not considered as part of the calculated response rates (subtracted from selected households to generate the denominator). Unoccupied households were not specified, and thus may be included in the response rate.

[2] Individual response rates for women of reproductive age are based upon the number of women household members age 15-49 listed as eligible in the roster and presence in the dietary diversity module.

Source: Feed the Future Interim Supplemental Survey (FTFISS), Tanzania, 2016.

### 2.1.2 Secondary Data

This section discusses the use of secondary data sources for the calculation of interim indicators. As shown in Table 2.1.2, the Tanzania National Panel Survey (NPS) was used to measure three indicators: Daily per capita expenses, Prevalence of poverty, and Depth of poverty. The Tanzania Demographic and Health Survey (DHS) was used to measure child feeding indicators, such as minimum acceptable diet (MAD) and exclusive breastfeeding, as well as child and women nutritional status through prevalence of stunting, wasting, and underweight.

***Table 2.1.2 Secondary data sources used for the ZOI interim assessment in Tanzania 2014-16***

| Name of data source | Indicators | Fieldwork dates | Sample size in the ZOI |
|---|---|---|---|
| Tanzania National Panel Survey (NPS) | Daily per capita expenses, Prevalence of Poverty, Depth of Poverty | October 2014 – November 2015 | 4530 individuals<br>928 households |
| Tanzania Demographic and Health Survey (DHS) | Prevalence of exclusive breastfeeding, 0-5 mo<br>Prevalence of children 6-23 mo receiving a Minimum Acceptable Diet<br>Prevalence of underweight women<br>Prevalence of underweight, stunted and wasted children 0-59 mo<br>Prevalence of anemia in women<br>Prevalence of anemia in children 6-59 months | August 2015 – February 2016 | 18,563 individuals<br>3,824 households |

### 2.1.3 Comparability of Data Sources Used for the ZOI Interim Assessment

This section discusses the comparability across data sources for the interim assessment.

#### *Seasonality*

The Tanzania Zone of Influence has unimodal seasonality with lean season occurring typically from November to March, rains and green harvest from March to May, and the main Msimu harvest from May to August. **Table 2.1.3** below outlines the season in which interim data was collected. Refer back to **Table 2.1** to compare seasons across baseline and interim data collection.

It is important to note that the timing of the FTFISS (May-July) might have resulted in the data underestimating the prevalence of hunger because the data collection coincided with the usual harvest season of May-July. Additionally, the timing of the FTFISS, which is the interim source of women's dietary diversity, differed from the collection of baseline women's dietary diversity

as part of the 2010/11 TDHS (December-May). While Interim dietary diversity coincided with harvest season, the baseline coincided mostly with the lean season. This might lend the false impression of improvements in women's dietary diversity. Likewise, the measurement of children's dietary intake was collected as part of the 2015/16 TDHS from August to February, which is post-harvest and lean season. Thus, comparison of trends and interim levels of children's dietary diversity to women's dietary diversity (collected during the harvest) is not possible.

The collection of the TDHS, with which child feeding practices and children's and women's nutritional status are measured, occurred in different seasons in the baseline and interim. The baseline TDHS was conducted from December to May, which coincides with the end of the lean season and start of the rainy season. The interim TDHS was conducted from August to February, which encompasses the post harvest and lean season entirely. It is conceivable that this affects the comparison over time of child feeding practices, with the interim measuring very low for incidence of MAD and exclusive breastfeeding.

***Table 2.1.3 Seasonal issues affecting comparison of indicators across data sources***

| Indicator | Season of data collection for interim |
|---|---|
| Daily per capita expenditures | Whole year—TNPS, Oct 2014 – Nov 2015 |
| Prevalence of Poverty | Whole year—TNPS, Oct 2014 – Nov 2015 |
| Depth of Poverty | Whole year—TNPS, Oct 2014 – Nov 2015 |
| Women's Empowerment in Agriculture Index | Harvest – FTFISS, May – July, 2016 |
| Prevalence of households with moderate or severe hunger | Harvest – FTFISS, May – July, 2016 |
| Women's Dietary Diversity | Harvest – FTFISS, May – July, 2016 |
| Prevalence of exclusive breastfeeding among children under 6 months of age | Post harvest & lean season – TDHS, Aug 2015 – Feb 2016 |
| Prevalence of children 6-23 months receiving a minimum acceptable diet | Post harvest & lean season – TDHS, Aug 2015 – Feb 2016 |
| Prevalence of underweight children under 5 years of age | Post harvest & lean season – TDHS, Aug 2015 – Feb 2016 |
| Prevalence of stunted children under 5 years of age | Post harvest & lean season – TDHS, Aug 2015 – Feb 2016 |
| Prevalence of wasted children under 5 years of age | Post harvest & lean season – TDHS, Aug 2015 – Feb 2016 |
| Prevalence of underweight women | Post harvest & lean season – TDHS, Aug 2015 – Feb 2016 |

### *Other Issues*

The data required to calculate a household hunger score was not found in any baseline secondary data source. We thus have only an interim measure of household hunger.

A minimum acceptable diet (MAD) for children 6-23 months of age can be compared across baseline and interim for breastfed children only. Two components of MAD, minimum feeding frequency and minimum dietary diversity, can be compared across baseline and interim for both breastfed and non-breastfed children 6-23 months in age. MAD measures both the minimum feeding frequency and the minimum dietary diversity, as appropriate for both breastfed and non-breastfed children as well as for different age groups. The measure for breastfed children is straightforward, and involves counting the number of food groups consumed as well as the

number of solid feedings over the last 24 hours. The measure for non breastfed children differs slightly from that for breastfed children in that it does not count dairy as a food group to be included in the dietary diversity measure, instead counting milk feeds along with solids in the feeding frequency index, and requiring that at least two of these feeds be milk feeds. The 2010/11 TDHS does not include the number of milk feeds over the last 24 hours in its questionnaire, and thus cannot be used to generate a baseline prevalence of MAD for non breastfed children.

The baseline data for Women's Dietary Diversity (WDD) did not collect information on the consumption of organ meats, which is one of the nine food groups considered in this measure. The interim data did collect data on organ meats, and it was included in the calculation of WDD. However, consumption of organ meats is not common; only 3.4 percent of the women had consumed organ meats in the interim survey. Including organ meats in the calculation of WDD only raises the mean by 0.03, from 4.47 to 4.50.

## 2.2 Measures and Reporting Conventions Used Throughout This Report

### 2.2.1 Standard Disaggregates

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

These variables are coded consistently; however, because data have been drawn from the Feed the Future Interim Supplemental Survey (FTFISS, the Tanzania Demographic and Health Survery (DHS) and the Tanzania National Panel Survey (NPS), there may be minor cross-source variations in the data used to derive the standard disaggregates. These are noted in the variable descriptions below. The data source used for each Feed the Future indicator is also the data source used to produce the disaggregate variables presented in the associated descriptive tables.

#### *Age in Months*

The age of children in months is collected in the child nutrition-focused module of the questionnaire, 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 monthly age groups as appropriate for the children's dietary intake and anthropometry tables. For example, for the MAD table, which presents the MAD indicator for children age 6-23 months, children's age in months is disaggregated into six-month age groups as follows: 6-11 months, 12-17 months, and 18- 23 months. For the children's anthropometry and anemia tables (Tables 7.2, 7.3, and 7.4), which present the prevalence of stunting, wasting, and underweight for all children under 5 years of age, children's age in months 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.

### *Age in Years*

Data on respondent's age in years is collected in the household roster. For women age 15-49 and children under age 6, more detailed age data are collected in subsequent questionnaire modules to confirm eligibility to respond to the module questions; these more detailed age data are used where available. Age is generally presented in the tables in 5- or 10-year age groups.

### *Child Sex*

The sex of the child – male or female – is a standard disaggregate for the tables presenting children's indicators, e.g., children's anthropometry.

### *Educational Attainment (Household)*

Household educational attainment reflects the highest level of education attained by any member of the household, as reported in the household roster of the corresponding questionnaire. This variable is used in tables that present household-level data, and is comprised of four categories: no education (households where no member has received any formal education); less than primary (households with at least one member who has entered the formal schooling system, but with no member who has completed primary); primary (households with at least one member whose highest educational attainment is completed primary, but with no member who has completed secondary); and secondary or more (households with at least one member whose highest educational attainment is completed secondary education or more). Households are categorized in only one of the four categories.

While educational attainment seems to be defined similarly across the 2015-16 TDHS and 2014-15 TNPS, there are slight variations in the proportions found in each household-level educational attainment category across both sources. As seen when comparing Table 3.1.1 and Appendix Table 3.1.A, the 2015-16 TDHS categorizes 58.5 percent of ZOI households as having attained primary education and 20.9 percent of ZOI households as attaining secondary or higher education. Meanwhile, TNPS categorizes 72.5 percent ZOI households as having attained primary education and only 4.8 percent ZOI households as having attained secondary education or higher.

### *Educational Attainment (Individual)*

Educational attainment at the individual level reflects the highest level of education attained by individual household members, as reported in the household roster of the corresponding questionnaire. This variable is comprised of four categories: no education (those who have not received any formal education), less than primary (those who have entered the formal schooling system but whose educational attainment is less than completed primary); primary (those who

have completed primary but have not completed secondary); and secondary or more (those who have completed secondary education or more).

As described above, while the TDHS and TNPS seem to have defined educational attainment similarly, the TDHS reports higher levels of educational attainment. As with household level educational attainment, this is true at an individual level as well. A comparison of Tables 3.4.1 – 3.4.2 with Appendix Table 3.4.A reveals that the TDHS reports higher attendance rates, higher proportions of attaining primary education, and higher literacy rates, along with lower female-male ratios.

### *Gendered Household Type*

Feed the Future Monitoring and Evaluation Guidance Series Volume 6: *Measuring the Gender Impact of Feed the Future* notes that household-level indicators should be disaggregated by *gendered household types* – that is: (1) households where members include both male and female adults;[46] (2) households where members include male adult(s), but no female adults; (3) households where members include female adult(s), but no male adults; and (4) households with only members under age 18 (children), i.e., households with children only and no adult members. This approach to conceptualizing household type is distinct from the standard *head of household* approach, which is embedded with presumptions about household gender dynamics and may perpetuate existing social inequalities and prioritization of household responsibilities that may be detrimental to women (USAID 2014:1).[47]

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 6.1 of this report, the household hunger scale (HHS) characterizes households according to three categories of hunger severity: little to no household hunger, moderate household hunger, and severe household hunger. For the purposes of serving as a disaggregate in selected tables, the HHS is converted to a dichotomous measure reflecting households that report little to no household hunger, and households that report moderate or severe household hunger. This can be used to disaggregate results only for those indicators collected in the Feed the Future ISS and TNPS – WEIA, women's dietary diversity, and expenditures and poverty.

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[46] Adult is defined as age 18 or older.

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

### *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.

### *Geographic Area*

Household level indicators can be disaggregated by different geographic areas of the ZOI: five mainland regions of Dodoma, Manyara, Morogoro, Mbeya and Iringa versus the islands of Zanzibar. Indicators can also be presented for "in-depth regions," the three mainland regions of Dodoma, Manyara, and Morogoro.

## 2.2.2 Reporting Conventions

The Feed the Future interim assessment reports are primarily descriptive in nature. This section provides an overview of the conventions used in reporting these descriptive results.

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

Bivariate relationships are described using cross tabulation, and the strength and direction of the relationships are assessed through the use of statistical tests. Analyses are performed in Stata using *svy* commands to handle features of data collected through the use of complex survey designs, including sampling weights, cluster sampling, and stratification.

Statistical significance ($p<0.05$) is denoted with matched superscripted letters attached to the row (usually the disaggregate variable) and column (usually the outcome variable) headings. Explanatory footnotes following each table clarify the meaning of the significance test annotation, and statistically significant relationships are highlighted in the narrative throughout the report.

# 3. ZOI Interim Survey Population

This section describes the background characteristics of the Zone of Influence (ZOI) population in Tanzania using data from the 2015/16 Tanzania Demographic and Health Survey (DHS). These same background characteristics are summarized using the 2014/15 Tanzania National Panel Survey as well (Appendix A1.3).

## 3.1 Demographics

**Tables 3.1.1 and 3.1.2** present demographic characteristics of the households in the ZOI. They present the average household size, as well as the average number of female adults and children within the household. Household education, defined as the highest level of education of any member of the household, is also presented in this table. In **Table 3.1.1**, values are shown for all households, as well as by categories of gendered household type.

***Table 3.1.1 Household demographic characteristics, by gendered household type – TDHS 2015-16***

| Characteristic | Total (All households) | By gendered household type[a] | | | |
|---|---|---|---|---|---|
| | | Male and female adult | Female adult(s) only | Male adult(s) only | Child only |
| Mean household size[a] | 4.4 | 5.1 | 3.2 | 1.6 | ^ |
| Mean number of adult female household members[1,2,a] | 1.1 | 1.3 | 1.2 | 0.0 | ^ |
| Mean number of children (<2 years)[1,a] | 0.3 | 0.3 | 0.2 | 0.1 | ^ |
| Mean number of children (0-4 years)[1,a] | 0.7 | 0.8 | 0.4 | 0.1 | ^ |
| Mean number of children (5-17 years)[1,a] | 1.6 | 1.8 | 1.5 | 0.4 | ^ |
| Mean percentage of adults who are female[1,2,a] | 53.6 | 49.6 | 100.0 | 0.0 | ^ |
| **Highest education level attained** | | | | | |
| No education (%)[a] | 5.9 | 2.5 | 17.4 | 8.8 | ^ |
| Less than primary (%)[a] | 14.8 | 11.3 | 25.2 | 20.2 | ^ |
| Primary (%)[a] | 58.5 | 62.0 | 47.9 | 52.6 | ^ |
| Secondary or more (%)[a] | 20.9 | 24.1 | 9.5 | 18.3 | ^ |
| **n[3]** | **3824** | **2945** | **581** | **297** | **1** |

^ Results not statistically reliable, n<30.
[1] The count 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.
[a] Significance tests were performed for associations between household characteristics and gendered household type. For example, a test was done between mean household size and gendered household type. When an association is found to be significant (p<0.05), a superscript is noted next to the household characteristic.

Source: Tanzania DHS 2015-16

The average household size in the ZOI is 4.4 people. The national average household size as calculated using data from the 2015/16 Tanzania Demographic and Health Survey (DHS) is 4.9 people.[48] Male and female adult households have an average of 5.1 members, while female adult only households have 3.2 members and male adult only households have 1.6 members. The superscripts in Table 3.1.1 show that household size varies significantly by gendered household type.

The mean number of adult female household members is 1.1. The mean number of children under 2 is 0.3; the mean number of children 0-4 years old is 0.7; the mean number of school age children age 5-17 years is 1.6. All of these household characteristics vary significantly across gendered household type.

The mean percentage of adults who are female is slightly over half, at 53.6%. In over half of the households in the ZOI (58.5%), the most schooled member of the household has completed their primary education. In fewer households, the most schooled member of the family has achieved secondary or more (20.9%), less than primary (14.8%) or no education (5.9%). Gendered household type is significantly associated with household educational attainment.

***Table 3.1.2 Household demographic characteristics, by geographic area – TDHS 2015-16***

| Characteristic | Total (All Households) | Zanzibar | Mainland ZOI |
|---|---|---|---|
| Mean household size[a] | 4.4 | 5.4 | 4.3 |
| Mean number of adult female household members[1,2,a] | 1.1 | 1.4 | 1.1 |
| Mean number of children (<2 years)[1,a] | 0.3 | 0.34 | 0.28 |
| Mean number of children (0-4 years)[1,a] | 0.7 | 0.83 | 0.65 |
| Mean number of children (5-17 years)[1,a] | 1.6 | 1.8 | 1.5 |
| Mean percentage of adults who are female[1,2] | 53.6 | 52.5 | 53.7 |
| **Highest education level attained** | | | |
| No education (%)[a] | 5.9 | 3.5 | 6.1 |
| Less than primary (%)[a] | 14.8 | 10.1 | 15.3 |
| Primary (%)[a] | 58.5 | 43.3 | 60.1 |
| Secondary or more (%)[a] | 20.9 | 43.0 | 18.5 |
| **n[3]** | **3824** | **1755** | **2069** |

1 The count 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.
a Two group mean comparison tests or tests of proportion that account for sample design were conducted across geographic area. When a significant difference is found ($p<0.05$), a superscript is noted next to the household characteristic. The means for some household characteristics are reported with two significant figures to the right of the decimal, in order to demonstrate significant differences across groups that would otherwise appear equal.

Source: Tanzania DHS 2015-16

[48] MoHCDGEC et. al., 2016.

In **Table 3.1.2**, values are shown for all households, and disaggregated by geographic region of the ZOI: Tanzania mainland versus Zanzibar. Households in Zanzibar are significantly larger than those of mainland ZOI, with 5.4 versus 4.3 members respectively. They also have significantly more children in each of the age groups presented.

The highest level of school attained at the household level varies significantly across geographic area. In Zanzibar, the most schooled household member in 86.3% of households has attained primary schooling or more, split roughly evenly between those who have completed primary and those who have completed secondary and higher. Meanwhile, only 78.6% of mainland ZOI households have a highest level of attained schooling of primary or above. Significantly more households in mainland ZOI regions have no education or less than primary when compared to Zanzibar.

## 3.2 Living Conditions

**Table 3.2** shows dwelling characteristics of the households in the ZOI. Many of these measures align with the 2015 Millennium Development Goals (MDG) definitions (UNDP 2003). The table presents the percentage of households who have access to an improved water source, improved sanitation, electricity, and solid cooking fuel. The average number of people per sleeping room, as well as roof, exterior wall, and floor materials are also presented. Values are shown for all households, as well as disaggregated by geographic area.

Table 3.3.1 reveals that over half of all households (59.5 percent) in the Tanzania ZOI have an improved source of drinking water. This is very similar to the national average from the 2015/16 Tanzania Demographic and Health Survey (DHS), which shows that 61 percent of households get their drinking water from an improved source.[49] This varies greatly across geographic region, with almost all households (96.4 percent) in Zanzibar obtaining water from an improved source, as compared to only 55.6 percent of mainland households.

***Table 3.2. Household dwelling characteristics – TDHS 2015-16***

| | Total ZOI (All households) | | Zanzibar ZOI | | Mainland ZOI | |
|---|---|---|---|---|---|---|
| **Characteristic** | **Estimate** | **n** | **Estimate** | **n** | **Estimate** | **n** |
| Percent with improved water source[1,a] | 59.5 | 3824 | 96.4 | 1755 | 55.6 | 2069 |
| Percent with improved sanitation[2,a] | 19.0 | 3824 | 58.7 | 1755 | 14.8 | 2069 |
| Mean persons per sleeping room[3] | 2.4 | 3824 | 2.3 | 1755 | 2.4 | 2069 |
| Percent using solid fuel for cooking[4,a] | 97.6 | 3773 | 94.4 | 1727 | 97.9 | 2046 |
| Percent with access to electricity[a] | 17.5 | 3824 | 47.2 | 1755 | 14.3 | 2069 |
| **Household roof materials (%)[5]** | | | | | | |
| Natural[a] | 22.2 | 3824 | 0.1 | 1755 | 24.6 | 2069 |

[49] MoHCDGEC et. al., 2016.

| | | | | | | |
|---|---|---|---|---|---|---|
| Rudimentary[a] | 2.2 | 3824 | 14.4 | 1755 | 0.9 | 2069 |
| Finished[a] | 75.5 | 3824 | 85.4 | 1755 | 74.5 | 2069 |
| **Household exterior wall materials (%)[6]** | | | | | | |
| Natural[a] | 3.8 | 3824 | 1.1 | 1755 | 4.1 | 2069 |
| Rudimentary[a] | 18.8 | 3824 | 25.9 | 1755 | 18.1 | 2069 |
| Finished | 74.8 | 3824 | 72.1 | 1755 | 75.1 | 2069 |
| **Household floor materials (%)[7]** | | | | | | |
| Natural[a] | 59.6 | 3824 | 23.4 | 1755 | 63.4 | 2069 |
| Rudimentary | 0.0 | 3824 | 0.0 | 1755 | 0.0 | 2069 |
| Finished[a] | 40.3 | 3824 | 76.5 | 1755 | 36.5 | 2069 |

[1] Improved water sources include *piped water into the dwelling, piped water into the yard, a public tap/standpipe, a tube well/borehole, a protected dug well, a protected spring,* and *rainwater* (WHO and UNICEF 2006). The proportion of the population with sustainable access to an improved water source is the 2015 MDG indicator #30 (UNDP 2003); however, as in most major international survey programs, the measure reported here reflects only access to an improved water source, and not the sustainability of that access.

[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 a *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 2015 MDG indicator #31 (UNDP 2003).

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

[4] Solid fuel is defined as *charcoal, wood, animal dung,* and *agriculture crop residue.* The proportion of the population using solid fuels is MDG indicator #29 (UNDP 2003). The *other* and *no food cooked in household* categories are removed from percentages.

[5] Natural roofs include *no roof, thatch/palm leaf,* and *sod.* Rudimentary roof includes *rustic mat, palm/bamboo, 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.

[6] Natural walls include *no walls, cane/palm/trunks,* and *dirt.* Rudimentary walls include *bamboo with mud, stone with mud, uncovered adobe, plywood, cardboard, reused wood,* and *metal sheeting.* Finished walls include *cement, stone with lime/cement, bricks, cement blocks, covered adobe,* and *wood planks/shingles.* The *other* category is removed from percentages.

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

[a] Two group mean comparison tests or tests of proportion that account for sample design were conducted across geographic area. When a significant difference is found ($p<0.05$), a superscript is noted next to the household characteristic.

Source: Tanzania DHS 2015-16

Only 19.0 percent of households in the ZOI have access to improved sanitation, which identical to the national average as reported in the 2015/16 Tanzania DHS Final Report.[50] This is significantly higher in Zanzibar (58.7 percent) when compared to mainland ZOI (14.8 percent).

Households in the ZOI have an average of 2.4 members per sleeping room, which is exactly the same as the national average. Nearly all households in the ZOI use solid fuel (firewood and charcoal) for cooking (97.6 percent), which is slightly higher than in the nation as a whole (94.6 percent). A significantly higher proportion of households in the mainland ZOI use solid fuel (97.9 percent) than Zanzibar (94.4 percent). Only 17.5 percent of ZOI household have access to electricity for lighting, which is lower than in the nation as a whole (21.9 percent). A significantly higher proportion of households in Zanzibar have electricity than those in mainland ZOI (47.2 percent versus 14.3 percent).

Three quarters (75.5 percent) of ZOI households have finished roofs, while almost one quarter (22.2 percent) has natural roofs and a very small percentage (2.2 percent) has rudimentary roofs.

[50] MoHCDGEC et. al., 2016.

This mirrors the proportions for the nation as a whole as well as for the mainland ZOI regions, but masks large and significant differences across Zanzibar and mainland ZOI regions. In Zanzibar, 85.4 percent of households have finished roofs while 14.4 percent have rudimentary roofs and virtually none have natural roofs.

Three quarters (74.8 percent) of ZOI households have finished walls, while 18.8 percent have rudimentary walls and 3.8 percent have natural walls. As with roofs, the proportions for all ZOI households look very similar to the national as well as the mainland ZOI proportions of wall type. The proportions look similar for Zanzibar as well, with significant differences between Zanzibar and mainland ZOI in the proportion of rudimentary wall type (25.9 percent in Zanzibar) and natural walls (only 1.1 percent in Zanzibar).

Finally, 59.6 percent of ZOI households have natural flooring while 40.3 percent have finished floors. Again, this is very similar to all Tanzania households, with 56.9 and 43.0 percent natural and finished floors, respectively. The differences in flooring type between Zanzibar and mainland ZOI are large and significant, with Zanzibar having a higher percentage of finished floors (76.5 percent) when compared to mainland ZOI (36.5 percent), and fewer natural floors (23.4 percent) when compared to mainland ZOI (63.4 percent).

## 3.3 Education

**Tables 3.3.1-3.3.2** present school attendance and educational attainment, female to male schooling ratios, and literacy in the ZOI, all disaggregated by Zanzibar and mainland ZOI. **Table 3.3.3** presents the percent of male, female, and all household members under age 25 who are currently attending school. It also presents the percent of household members over age 9 who have attained a primary level of education. Sex ratios in school attendance and attainment of primary education are presented in **Table 3.3.2**. The percent of household members of reproductive age who are reported as literate as well as sex ratios in literacy are presented in **Table 3.3.3**.[51] These measures align with MDG education indicators.

In Tanzania, official age for primary school education is age 7-13 years, with two years of pre-primary at ages 5-6 years. Secondary school age is 14-17 years.

**Table 3.3.1** reveals that most pre-primary and primary school age children are currently attending school (67.9 percent of 5-10 year olds and 84.1 percent of 11-14 year olds). School attendance varies significantly by age, dropping off to 40.5 percent for 15-19 year olds and only 9.7 percent for 20-24 year olds. There are significant differences in current school attendance across geographic area, with significantly higher proportions of 10-24 year olds currently

[51] DHS only collected literacy for 15-49 year old men and women.

attending school in Zanzibar when compared to mainland ZOI. There are no significant differences in current school attendance by sex.

Among ZOI household members over age 9, primary education attainment varies significantly by age as well as by sex. Approximately three-quarters of household members age 15-34 have attained primary school, with 20-24 year olds showing the highest proportion at 82.4 percent. Combining all age groups, 55 percent of women and 58 percent of men have attained primary school, a significant difference. Primary school attainment differs across geographic area for specific age groups: it is higher in Zanzibar for ages 25-29 and 55 and over, and higher for mainland ZOI for ages 10-14 and 35-54.

**Table 3.3.2** of the female to male school attendance and attainment ratios in the ZOI and across geographic areas of the ZOI reveals that a higher proportion of girls than boys attends school and have attained a primary level of education at younger ages (5-14), while the reverse is true for older household members.

### 3.3.1 School attendance and educational attainment[1,2] – TDHS 2015-16

| Characteristic | Total ZOI | | | Zanzibar ZOI | | | Mainland ZOI | | |
|---|---|---|---|---|---|---|---|---|---|
| | Attends school[a] | Attained a primary level of education[b] | n[3] | Attends school[c] | Attained a primary level of education[d] | n[3] | Attends school[e] | Attained a primary level of education[f] | n[3] |
| **ALL[ce]** | **58.1** | **56.5** | **15,709** | **65.3** | **59.2** | **7,968** | **57.1** | **56.1** | **7,741** |
| **Age[a,b,c,d,e,f]** | | | | | | | | | |
| **5-9** | 67.9 | n/a[1] | 2,832 | 69.6 | n/a[1] | 1,377 | 67.7 | n/a[1] | 1,455 |
| **10-14[ce,df]** | 84.1 | 16.6 | 2,550 | 93.2 | 9.8 | 1,237 | 83.0 | 17.4 | 1,313 |
| **15-19[ce]** | 40.5 | 76.3 | 1,946 | 65.3 | 78.4 | 1,068 | 36.6 | 75.9 | 878 |
| **20-24[ce]** | 9.7 | 82.4 | 1,416 | 17.4 | 84.9 | 771 | 8.5 | 82.0 | 645 |
| **25-29[df]** | n/a[2] | 75.3 | 1,204 | n/a[2] | 82.4 | 662 | n/a[2] | 74.2 | 542 |
| **30-34** | n/a[2] | 74.2 | 976 | n/a[2] | 75.8 | 483 | n/a[2] | 74.0 | 493 |
| **35-54[df]** | n/a[2] | 71.8 | 3,073 | n/a[2] | 64.9 | 1,578 | n/a[2] | 72.8 | 1,495 |
| **55+[df]** | n/a[2] | 27.4 | 1,712 | n/a[2] | 37.9 | 792 | n/a[2] | 26.2 | 920 |
| **Sex[b,f]** | | | | | | | | | |
| **Female[ce,df]** | **58.7** | **55.0** | **7,964** | **64.2** | **59.0** | **4,072** | **58.0** | **54.4** | **3,892** |
| **Age[a,b,c,d,e,f]** | | | | | | | | | |
| 5-9 | 70.4 | n/a[1] | 1,456 | 71.1 | n/a[1] | 747 | 70.3 | n/a[1] | 709 |
| 10-14[ce,df] | 86.1 | 19.8 | 1,225 | 93.7 | 11.0 | 578 | 85.3 | 20.8 | 647 |
| 15-19[ce] | 40.6 | 84.5 | 944 | 63.0 | 85.4 | 542 | 36.7 | 84.3 | 402 |
| 20-24[ce] | 7.2 | 80.0 | 732 | 14.1 | 85.7 | 391 | 6.2 | 79.1 | 341 |
| 25-29 | n/a[2] | 74.4 | 627 | n/a[2] | 81.5 | 341 | n/a[2] | 73.3 | 286 |
| 30-34 | n/a[2] | 71.7 | 513 | n/a[2] | 74.8 | 246 | n/a[2] | 71.3 | 267 |
| 35-54 | n/a[2] | 67.2 | 1,607 | n/a[2] | 61.6 | 838 | n/a[2] | 68.0 | 769 |
| 55+[df] | n/a[2] | 13.9 | 860 | n/a[2] | 23.4 | 389 | n/a[2] | 12.9 | 471 |
| | | | | | | | | | |
| **Male[ce]** | **57.5** | **58.0** | **7,745** | **66.4** | **59.4** | **3,896** | **56.3** | **57.8** | **3,849** |
| **Age[a,b,c,d,e,f]** | | | | | | | | | |
| 5-9 | 65.5 | n/a[1] | 1,376 | 67.9 | n/a[1] | 630 | 65.2 | n/a[1] | 746 |
| 10-14[ce,df] | 82.1 | 13.4 | 1,325 | 92.8 | 8.8 | 659 | 80.7 | 14.0 | 666 |
| 15-19[ce] | 40.4 | 68.9 | 1,002 | 67.7 | 71.0 | 526 | 36.5 | 68.6 | 476 |
| 20-24[ce] | 12.7 | 85.3 | 684 | 20.7 | 84.1 | 380 | 11.2 | 85.5 | 304 |
| 25-29[df] | n/a[2] | 76.3 | 577 | n/a[2] | 83.4 | 321 | n/a[2] | 75.2 | 256 |
| 30-34 | n/a[2] | 77.0 | 463 | n/a[2] | 76.8 | 237 | n/a[2] | 77.0 | 226 |
| 35-54[df] | n/a[2] | 76.8 | 1,466 | n/a[2] | 68.6 | 740 | n/a[2] | 77.9 | 726 |
| 55+[df] | n/a[2] | 41.1 | 852 | n/a[2] | 51.6 | 403 | n/a[2] | 39.9 | 449 |

n/a[1] Not applicable – Children in the age group 5-9 years are not yet old enough to have attained a primary level of education.
n/a[2] Not applicable – Current school attendance applies to school-age children and youth only, ages 5-24.

[1] The academic year in Tanzania starts in January and ends in November. The TDHS data was collected August 2015 – February 2016.

[2] The goals of achieving universal primary education and achieving gender equity with respect to education are assessed by multiple MDG indicators, typically using administrative school data. This table presents respondent-reported school attendance and primary educational attainment (UNDP 2003).

[3] The total number of people in the ZOI age 5 and above is listed. Actual sample sizes are as follows: **ZOI:** "attends school" is 8,744 (4,387 female and 4,357 male), "attained primary" is 12,877 (6,369 female and 6,508 male). **Zanzibar:** "attends school" is 4,453 (2,258 female and 2,195 male), "attained primary" is 6,591 (3,325 female and 3,266 male). **Mainland ZOI:** "attends school" is 4,291 (2,099 female and 2,192 male), "attained primary" is 6,286 (3,183 female and 3,103 male).

[a-f] Significance tests were performed for associations between the indicator in the column heading, and age and sex. For example, a test was done for school attendance by sex, and a test was done for school attendance by age. When an association is found to be significant ($p<0.05$), the superscript of the column heading will appear next to the sex row heading and/or next to the age group row heading. Significance tests were also performed for differences across geographic area. When there is a significant difference across geographic area, ($p<0.05$), a combined indicator from column heading will appear next to the specific sex or specific age group row heading. For example, if there is a significant difference in school attendance between mainland ZOI and Zanzibar, c-e will appear next to "ALL."

*Table 3.3.2 Female to Male School Attendance and Attainment Ratios[1,2,3] – TDHS 2015-16*

| Characteristic | Total ZOI | | | Zanzibar ZOI | | | Mainland ZOI | | |
|---|---|---|---|---|---|---|---|---|---|
| | Attends school | Attained a primary level of education | n | Attends school | Attained a primary level of education | n | Attends school | Attained a primary level of education | n |
| **Age group** | | | | | | | | | |
| **5-9** | 1.07 | n/a[1] | 2832 | 1.05 | n/a[1] | 1,377 | 1.08 | n/a[1] | 1,455 |
| **10-14** | 1.05 | 1.48 | 2550 | 1.01 | 1.25 | 1,237 | 1.06 | 1.49 | 1,313 |
| **15-19** | 1.00 | 1.23 | 1946 | 0.93 | 1.20 | 1,068 | 1.01 | 1.23 | 878 |
| **20-24** | 0.57 | 0.94 | 1416 | 0.68 | 1.02 | 771 | 0.55 | 0.93 | 645 |
| **25-29** | n/a[2] | 0.98 | 1204 | n/a[2] | 0.98 | 662 | n/a[2] | 0.97 | 542 |
| **30-34** | n/a[2] | 0.93 | 976 | n/a[2] | 0.97 | 483 | n/a[2] | 0.93 | 493 |
| **35-54** | n/a[2] | 0.88 | 3073 | n/a[2] | 0.90 | 1,578 | n/a[2] | 0.87 | 1,495 |
| **55+** | n/a[2] | 0.34 | 1712 | n/a[2] | 0.45 | 792 | n/a[2] | 0.32 | 920 |

n/a[1] Not applicable – Children in the age group 5-9 years are not yet old enough to have attained a primary level of education.

n/a[2] Not applicable – Current school attendance applies to school-age children and youth only, ages 5-24.

[1] The academic year in Tanzania starts in January and ends in November. The TDHS data was collected August 2015 – February 2016.

[2] The goals of achieving universal primary education and achieving gender equity with respect to education are assessed by multiple MDG indicators, typically using administrative school data. This table presents the ratio of females to males on these measures (UNDP 2003).

[3] The MDG indicators for universal primary education and gender equity within education are assessed through the literacy rate (MDG indicator #8) and the ratio of literate women to men (MDG indicator #10) among young adults, age 15-24 years (UNDP 2003).

Source: Tanzania DHS 2015-16.

**Table 3.3.3** of literacy rates by age group, sex, and geographic area reveals that the literacy rate in the greater ZOI is 77.1 percent, but varies significantly by geographic area, with a higher literacy rate in Zanzibar (83.4 percent) than in mainland ZOI (76.2 percent). This holds true for male household members, but the difference in literacy rates across geographic areas for females is not significant. Literacy rates vary significantly between males and females on Zanzibar only. Literacy rates in the ZOI and both geographic areas of the ZOI vary significantly by age group for females and males combined and for females alone. Literacy for males on Zanzibar also varies significantly by age group.

### *Table 3.3.3 Literacy[1] – TNPS 2014-15*

| Characteristic | Total ZOI Percent Literate[a] | Total ZOI Female to male ratio, Literate | Total ZOI n | Zanzibar ZOI* Percent Literate[b] | Zanzibar ZOI* Female to male ratio, Literate | Zanzibar ZOI* n | Mainland ZOI* Percent Literate[c] | Mainland ZOI* Female to male ratio, Literate | Mainland ZOI* n |
|---|---|---|---|---|---|---|---|---|---|
| **All*** | **77.1** | | **4603** | **83.4** | | **2445** | **76.2** | | **2158** |
| **Age group[a,b,c]** | | | | | | | | | |
| **15-19*** | **79.4** | **1.12** | **1103** | **87.4** | **0.99** | **640** | **78.1** | **1.14** | **463** |
| **20-24*** | **84.0** | **0.96** | **832** | **91.4** | **0.95** | **453** | **82.8** | **0.97** | **379** |
| **25-29*** | **76.3** | **0.94** | **670** | **85.4** | **0.95** | **373** | **74.9** | **0.94** | **297** |
| **30-34*** | **75.4** | **1.03** | **564** | **84.2** | **0.95** | **265** | **74.3** | **1.04** | **299** |
| **35-49** | **72.9** | **0.94** | **1434** | **72.4** | **0.88** | **714** | **73.0** | **0.95** | **720** |
| **Sex[b]** | | | | | | | | | |
| **Female** | **76.9** | **n/a** | **3629** | **80.8** | **n/a** | **1955** | **76.3** | **n/a** | **1674** |
| **Age group[a,b,c]** | | | | | | | | | |
| 15-19 | 84.5 | n/a | 839 | 87.1 | n/a | 500 | 84.0 | n/a | 339 |
| 20-24* | 82.7 | n/a | 642 | 89.1 | n/a | 349 | 81.6 | n/a | 293 |
| 25-29* | 74.1 | n/a | 538 | 83.3 | n/a | 298 | 72.7 | n/a | 240 |
| 30-34 | 76.4 | n/a | 452 | 82.1 | n/a | 211 | 75.7 | n/a | 241 |
| 35-49 | 70.7 | n/a | 1158 | 68.7 | n/a | 597 | 71.0 | n/a | 561 |
| **Male*** | **77.3** | **n/a** | **974** | **86.5** | **n/a** | **490** | **76.0** | **n/a** | **484** |
| **Age group[b]** | | | | | | | | | |
| 15-19* | 75.3 | n/a | 264 | 87.8 | n/a | 140 | 73.5 | n/a | 124 |
| 20-24* | 85.5 | n/a | 190 | 93.7 | n/a | 104 | 84.0 | n/a | 86 |
| 25-29 | 78.6 | n/a | 132 | 87.9 | n/a | 75 | 77.3 | n/a | 57 |
| 30-34 | 74.3 | n/a | 112 | 86.5 | n/a | 54 | 72.6 | n/a | 58 |
| 35-49 | 75.1 | n/a | 276 | 77.8 | n/a | 117 | 74.9 | n/a | 159 |

n/a Not applicable – Female to male ratios cannot be calculated for male-only and female-only disaggregates.

[1] The MDG indicators for universal primary education and gender equity within education are assessed through the literacy rate (MDG indicator #8) and the ratio of literate women to men (MDG indicator #10) among young adults, age 15-24 years (UNDP 2003).

[a-c] Significance tests were performed for associations between the indicator in the column heading, and age and sex. For example, a test was done for school attendance by sex, and a test was done for school attendance by age. When an association is found to be significant ($p<0.05$), the superscript of the column heading will appear next to the sex row heading and/or next to the age group row heading.

* Significance tests were performed for differences across geographic area. When there is a significant difference across geographic area, ($p<0.05$), the * will appear next to the sex or specific age group row heading.

Source: ZOI interim survey, Tanzania DHS 2015-2016

# 4. Household Economic Status

This section includes a background discussion of monetary poverty in Tanzania, including the logic of the Living Standard Measurement Survey (LSMS)[52] and consumption expenditure methodology.

Tanzania exhibits strong and stable economic growth relative to other African countries, with an average annual GDP growth rate of 6-7 percent over the past decade. However, this economic growth is driven by productivity gains in tourism, financial services, construction, trade and mining, which are largely urban or capital intensive, and have not been accompanied by an expansion of job opportunities. In contrast, the rate of growth in the rural and labor intensive agricultural sector is lower than other sectors and declining, from 4.5% in 2001 to 3.7% in 2010 and 2.2% annual growth in 2015. The agricultural sector, the mainstay of the rural economy, provides livelihood for 80% of the population, employs 66 percent of the labor force, and accounts for 29 percent of the GDP in 2015.[53]

The relative low productivity and growth of agriculture might explain the relatively slow decline in rural poverty, even amidst solid national economic growth. The Household Budgetary Survey measures that between 2007 and 2012, the percentage of people living below the basic needs poverty line on the Tanzania mainland decreased by only 6 percentage points, from 33.3 to 28.2 percent. Basic needs poverty on Zanzibar was measured to be 49% in 2005 and 44.4% in 2010.[54] The national poverty rate, as defined by the international per capita poverty line of $1.25/day (2005 PPP) and measured by the National Panel Survey, was 40 percent in 2010, declining to only 37% in 2015. The poverty level and direction of change varies greatly over strata defined by urban/rural, mainland/Zanzibar. Mainland rural Tanzania had a poverty rate of 49.6% in 2010, declining only to 47.6% in 2015. Zanzibar's poverty rate was lower and showed greater decline, at 34% in 2010 and 27.8% in 2015. Dar es Salaam had a much lower yet increasing poverty rate: 2.8% in 2010 and 3.4% in 2015. Poverty in other mainland urban areas was 19.7% in 2010 going down only to 18.1% in 2015.[55] In 2012, the average per capita income placed Tanzania in 176$^{th}$ position out of 191 countries in the world.[56]

The *Household Roster* and *Household Consumption Expenditure* modules of the 2014-15 Tanzania National Panel Survey (NPS) are used to calculate the per capita expenditures and

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[52] 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.

[53] Economic and Social Research Foundation et. al. 2015. CountryStat, 2017. NBS 2017. The World Bank Group, 2017a, puts agricultural GDP at 22% in 2015. Feed the Future Tanzania Country page cites agriculture has 31.5% share of GDP.

[54] Economic and Social Research Foundation, et. al., 2015.

[55] Measured using national level data from TZNPS 2010/11 and TZNPS 2014/15.

[56] The World Bank. 2015.

prevalence of poverty indicators. The TNPS is part of the Living Standards Measurement Study – Integrated Surveys on Agriculture (LSMS-ISA). The household consumption expenditure module measures households' consumption of various food and non-food items to infer household income and well-being. Individuals' per capita expenditures are then derived by dividing total household expenditures by the number of household members. From these data, household expenditure totals are calculated and used as a proxy for household incomes, based on the assumption that a household's consumption is closely related to its income. Household consumption and expenditures are often preferred to income when measuring poverty due to the difficulty in accurately measuring income. According to Deaton, expenditure data are less prone to error, easier to recall, and more stable over time than income data.[57]

## 4.1 Daily Per Capita Expenditures

**Table 4.1** presents daily per capita expenditures, the Feed the Future indicator that measures average daily expenditures within the ZOI per person in 2010 U.S. dollars (USD) after adjusting for 2005 purchasing power parity (PPP). Daily per capita expenditures serve as a proxy for income. This table includes the mean per capita expenditures and percentile distribution of per capita expenditures. The percentiles are interpreted as the percent of individuals that consume less than the listed value. For example, the cutoff value for the 50$^{th}$ percentile is $1.79, meaning that 50 percent of the population consumes less than $1.79 per day. The percentiles are shown to provide information on the distribution of expenditures. As is typical of expenditure and income data, these estimates are positively skewed, with the majority of the population consuming/spending very little, and a small portion consuming much more. This is seen in the difference between the median, or 50$^{th}$ percentile, cutoff of $1.79 2010 USD, which is much less than the mean daily per capita expenditure of $2.31 2010 USD.

Estimates in Table 4.1 are shown for all households as well as disaggregated by household characteristics, including gendered household type, household size, and household educational attainment. Table 4.1 shows significant differences in mean per capita expenditures across gendered household type, household size, and household educational attainment. Households with male adults only have higher per capita expenditures than other household types. Smaller households seem to have higher per capita expenditures than bigger households. Households with at least one member who has attained primary spend more per capita than those with lower educational attainment. Households with at least one household member who has attained secondary level or higher spend double what primary attaining households spend.

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

*Table 4.1. Daily per capita expenditures by household characteristic (in 2010 USD[1])*

| Characteristic | Estimate (weighted) | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Percentile | | | | | |
| | Mean[a] | 10th | 25th | 50th | 75th | 90th | n[2] |
| **Total (All households)** | **2.31** | **0.86** | **1.16** | **1.79** | **2.80** | **4.30** | **4525** |
| **Geographic areas of ZOI** | | | | | | | |
| Zanzibar | 2.14 | 0.92 | 1.31 | 1.84 | 2.69 | 3.45 | 2623 |
| Mainland | 2.33 | 0.86 | 1.16 | 1.78 | 2.81 | 4.39 | 1902 |
| In Depth Regions | 2.33 | 0.78 | 1.03 | 1.54 | 2.92 | 4.84 | 1091 |
| **Gendered household type[3,a]** | | | | | | | |
| Male and female adults | 2.29 | 0.87 | 1.20 | 1.80 | 2.74 | 4.30 | 3867 |
| Female adult(s) only | 2.21 | 0.82 | 1.05 | 1.42 | 2.54 | 4.27 | 578 |
| Male adult(s) only | 3.68 | 1.63 | 2.53 | 3.16 | 4.15 | 6.16 | 80 |
| **Household size[a]** | | | | | | | |
| Small (1-5 members) | 2.79 | 0.98 | 1.37 | 2.18 | 3.22 | 5.20 | 1924 |
| Medium (6-10 members) | 1.90 | 0.78 | 1.06 | 1.57 | 2.36 | 3.21 | 2372 |
| Large (11+ members) | 1.63 | 0.88 | 0.95 | 1.38 | 1.67 | 4.30 | 229 |
| **Household educational attainment[a]** | | | | | | | |
| No education | 1.91 | 0.83 | 1.11 | 1.51 | 2.52 | 3.03 | 138 |
| Less than primary | 1.54 | 0.70 | 0.88 | 1.30 | 1.75 | 3.05 | 537 |
| Primary | 2.26 | 0.91 | 1.20 | 1.86 | 2.74 | 4.09 | 3434 |
| Secondary or more | 5.53 | 2.29 | 2.53 | 4.30 | 6.69 | 10.61 | 416 |

[1] Per capita expenditures measured in Tanzania shillings were converted to 2010 USD using the Consumer Price Index (CPI) and the PPP Index estimated by the World Bank. We used the formula (2005 CPI LCU/ 2015 CPI LCU)*1/(PPP 2005)* (2010 USD CPI /2005 USD CPI) where LCU PPP 2005 = 482.45, 2015 CPI LCU = 158.02 (annually – a monthly CPI was used in the calculation), 2005 CPI LCU =66.33, 2010 USD CPI =111.65, and 2005 USD CPI = 100.

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

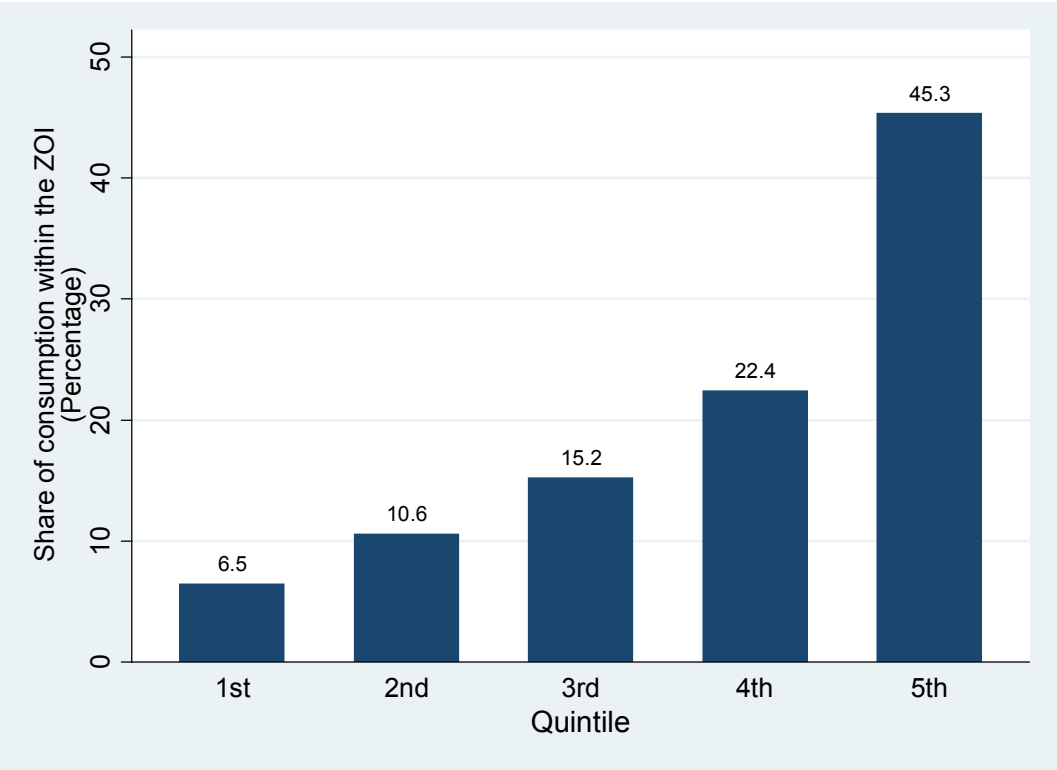
[3] No Children only households exist in the ZOI

[a] Significance tests were performed for associations between per capita expenditures and household characteristics. For example, a test was done between per capita expenditures and gendered household type. When an association is found to be significant ($p<0.05$), the superscript is noted next to the household characteristic.

Source: Tanzania NPS, October 2014 – November 2015.

Figure 4.1 shows the share of total consumption per quintile in the ZOI. The share of consumption attributed to the lowest quintile (the bottom 20 percent) is a measure of inequality, and an MDG. This figure shows that the poorest 20 percent within the ZOI consumes only 6.5 percent of the total consumption in the ZOI, while the wealthiest quintile consumes 45.3 percent of the total consumption in the ZOI.

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




[1] Share of the poorest quintile in national consumption is an MDG indicator that provides information on income inequality (UNDP 2003). 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 ZOI.

## 4.2 Prevalence and Depth of Poverty in the ZOI

The prevalence of poverty, sometimes called the poverty headcount ratio, is measured by determining the percent of individuals living below a poverty threshold.[58] Estimates of poverty prevalence are sensitive to the poverty thresholds used to identify the poor. A standardized

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

poverty threshold of $1.25 per person per day in adjusted[59] 2005 USD is used to track global changes in poverty across countries and over time, including for the purpose of monitoring progress toward international goals such as the MDG to eradicate extreme poverty and hunger.[60] The $1.25 threshold is in effect the extreme poverty threshold and represents the poverty line typical of the world's poorest countries.[61]

Where the 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 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 shortfall of the poor, in contrast, is estimated for only those individuals living below the poverty line.

### 4.2.1 The $1.25 Poverty Threshold

**Table 4.2.1** presents poverty estimates at the $1.25 per day (2005 PPP) threshold.[62] The prevalence of poverty and depth of poverty at the $1.25 per day poverty line are Feed the Future indicators. Similar to the per capita expenditures table, this table presents poverty estimates for all households in the ZOI, as well as disaggregated by household characteristics, including geographic area, gendered household type, household size, and household educational attainment.

#### *Poverty Prevalence*

Thirty-seven percent of individuals in the ZOI live below the $1.25 poverty threshold. The prevalence of poverty is significantly different across geographic area, gendered household type, household size and household educational attainment. Poverty is higher in the mainland ZOI regions than in Zanzibar. Poverty is lowest in households with male adult(s) only. Poverty also seems to increase in prevalence as household size increases. Finally, poverty is lowest in households where the highest educational attainment is secondary education or higher.

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[59] Adjustments are made according to PPP conversions. These conversions are established by the World Bank to allow currencies to be compared across countries in terms of how much an individual can buy in a specific country. The $1.25 in 2005 PPP means that $1.25 could buy the same amount of goods in another country as $1.25 could in the United States in 2005.

[60] The World Bank recently issued 2011 PPPs (see http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD) and a revised standardized poverty threshold of $1.90 per person per day in 2011 PPP.

[61] World Bank. 2011. Poverty & Equality Data FAQs. http://go.worldbank.org/PYLADRLUN0. Accessed 15 April 2015.

[62] **Appendix Table 1.2** presents poverty estimates at the new $1.90 per day (2011 PPP) threshold.

### *Depth of Poverty*

The depth of poverty in the ZOI is 10 percent, which indicates that the average gap between consumption levels of the population and the poverty line is $0.125 (2005 PPP).

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 below the poverty line up to the poverty line. With a ZOI population of 11.6 million, a poverty threshold of $1.25 per day, and a poverty gap of 10 percent, $1,450,000 (2005 PPP) per day would need to be transferred to the poor to bring their income or expenditures up to the poverty threshold.

Differences in depth of poverty across all of the background characteristics are significant. Depth of poverty is lower in Zanzibar when compared to mainland ZOI, lower in male adult(s) only households, lower in the smallest households, and also for households where at least one member has achieved secondary education or higher.

### *Average Consumption Shortfall of the Poor*

The average *poor* person within the ZOI lives at 72.7 percent of the poverty line, or 27.3 percent below the poverty line. The average value of consumption of a *poor* person is $0.91 (2005 PPP) per day. Among poor households, there are significant differences in the average shortfall across household size and educational attainment. Medium-sized households had the largest consumption shortfall among the poor, while households with less than primary educational attainment had a higher consumption shortfall than both households with no education and households attaining primary education or above.

### *Table 4.2.1 Poverty at the $1.25 (2005 PPP)[1] per person per day threshold*

| Characteristic | Prevalence of Poverty[2,5] | | Depth of Poverty[3,5] | | Average consumption shortfall of the poor[4,5] | | |
|---|---|---|---|---|---|---|---|
| | Percent population[a] | n[6] | Percent of poverty line[b] | n[6] | In USD 2005 PPP[c] | Percent of poverty line[c] | n[6] |
| **Total (All households)** | **36.7** | **4525** | **10.0** | **4525** | **0.34** | **27.3** | **1363** |
| **Geographic areas of ZOI[a,b]** | | | | | | | |
| Zanzibar | 27.8 | 2623 | 7.8 | 2623 | 0.35 | 28.2 | 656 |
| Mainland | 38.0 | 1902 | 10.3 | 1902 | 0.34 | 27.2 | 707 |
| **Gendered household type[7,a,b]** | | | | | | | |
| Male and female adults | 35.3 | 3867 | 9.6 | 3867 | 0.34 | 27.3 | 1121 |
| Female adult(s) only | 48.4 | 578 | 13.2 | 578 | 0.34 | 27.3 | 233 |
| Male adult(s) only | 5.6 | 80 | 1.7 | 80 | ^ | ^ | 9 |
| **Household size[a,b,c]** | | | | | | | |
| Small (1-5 members) | 27.1 | 1924 | 6.6 | 1924 | 0.30 | 24.3 | 367 |
| Medium (6-10 members) | 43.9 | 2372 | 12.8 | 2372 | 0.37 | 29.3 | 878 |
| Large (11+ members) | 59.9 | 229 | 15.4 | 229 | 0.32 | 25.8 | 118 |
| **Household educational attainment[a,b,c]** | | | | | | | |
| No education | 40.6 | 138 | 10.6 | 138 | 0.33 | 26.0 | 57 |
| Less than primary | 59.5 | 537 | 17.9 | 537 | 0.38 | 30.1 | 299 |
| Primary | 34.6 | 3434 | 9.1 | 3434 | 0.33 | 26.4 | 998 |
| Secondary or more | 0.6 | 416 | 0.1 | 416 | ^ | ^ | 9 |

[1] The Feed the Future poverty indicators are based on the poverty threshold of $1.25 (2005 PPP) per person per day.

[2] The prevalence of poverty is the percentage of individuals living below the $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.

[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] A significance test was performed for associations between the indicator in the column heading and each of the variables in the rows. For example, a test was done between prevalence of poverty and gendered household type. When an association between the column indicator and row variable is found to be significant ($p<0.05$), the superscript for the indicator in the column heading is noted next to the row variable.

[6] 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.

[7] There are no Children Only households in the ZOI.

[a-c] Superscripts in the column heading indicates significance tests were performed for associations between the indicator in the column heading and each of the variables in the rows. For example, a test was done between prevalence of poverty and gendered household type. When an association between the column indicator and row variable is found to be significant ($p<0.05$), the superscript for the indicator in the column heading is noted next to the row variable

Source: Tanzania NPS, October 2014-November 2015.

# 5. Women's Empowerment in Agriculture

While women play a prominent role in agriculture, they face persistent economic and social constraints. Because of this, women's empowerment is a main focus of Feed the Future. Empowering women is particularly important to achieving the Feed the Future objectives of inclusive agriculture sector growth and improved nutritional status. The WEAI was 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.[63] The following section presents baseline WEAI scores for Feed the Future's ZOI.[64] For more information, the WEAI questionnaires and manual can be found online.[65]

## 5.1 Overview

The WEAI measures empowerment in five domains. The *Production* domain assesses the ability of individuals to provide input and autonomously make decisions about agricultural production. The *Resources* domain reflects individuals' control over and access to productive resources. The *Income* domain monitors individuals' ability to direct the financial resources derived from agricultural production or other sources. The *Leadership* domain reflects individuals' social capital and comfort speaking in public within their community. The *Time* domain reflects individuals' workload and satisfaction with leisure time. The WEAI aggregates information collected for each of the five domains into a single empowerment indicator.

The index is composed of two subindices: the Five Domains of Empowerment subindex (5DE), which measures the empowerment of women in the five empowerment domains, and the Gender Parity Index (GPI), which measures the relative empowerment of men and women within the household. The WEAI questionnaire is asked of the primary adult male and female decisionmaker in each household and compares the 5DE profiles of women and men in the same household. The primary adult decisionmakers are individuals age 18 or older who are self-identified as the primary male or female decisionmaker during the collection of the household roster.[66] The WEAI score is computed as a weighted sum of the ZOI-level 5DE and the GPI.

### Tanzania WEAI Results

**Methodology:** USAID/Tanzania used secondary sources of data to report on baseline indicator results. Because the WEAI data was not available through secondary sources at baseline, the WEAI baseline data was collected as part of Feed the Future Interim Supplemental Survey

[63] Alkire, S. Malapit, H., et al. (2013).
[64] The International Food Policy Research Institute's WEAI team conducted analysis of the WEAI data.
[65] IFPRI. (2013). http://feedthefuture.gov/lp/womens-empowerment-agriculture-index
[66] The respondents of the WEAI questionnaire are only the primary decisionmakers in the household and, therefore, may not be representative of the entire female and male populations in the surveyed area.

(FTFISS). The sample for the Tanzania FTFISS consists of 723 households in 22 enumeration areas in the Zone of Influence. The Tanzania National Bureau of Statistics (NBS) collected data between May and July 2016.

The sample included both rural and urban households, however, less than 35 percent of urban households were engaged in agricultural activities. Because the WEAI measures the empowerment of women in the agricultural sector, 319 households in urban areas were removed from the calculation of the WEAI. From the remaining 404 rural households, an additional 117 households with incomplete data were dropped. The final sample is 287 rural households, 287 females and 229 males, distributed in 12 enumeration areas in the Zone of Influence.

A noted methodological issue was women in the sample reported above average rates of participation in decisionmaking over household income and ownership of assets. Among female respondents, 99 percent reported they had some input in decisions over income regarding at least one activity they participated in, and 82 percent reported they had sole or joint ownership over two or more large assets.[67] As a result, over 99 percent of female respondents in the sample experienced adequacy in the two indicators of empowerment: ***Control Over the Use of Income*** and ***Ownership of Assets***.

To account for the high rates of women's asset ownership and decisionmaking influence over income, two sets of WEAI results were calculated. The first set of results used the original adequacy thresholds set for the five WEAI domains. In the second set of WEAI results, the adequacy thresholds were adjusted for two indicators: 1) the adequacy threshold for Control Over the Use of Income changed from having input in *some* decisions to having input in *most or all decisions* regarding income in one activity, and 2) the adequacy threshold for Ownership of Land and Assets changed from owning *two small assets or one large assets* to owning *three large assets*.

## Tanzania WEAI SCORES

Based on the above description of the WEAI data collected at baseline in Tanzania, WEAI summary results presented in the next sections comprise i) adjusted and unadjusted values for the aggregate WEAI and its sub-indexes, and ii) adequacy achievements and constraints to women's empowerment, based on values for the WEAI empowerment indicators.

### *Tanzania WEAI Score and Women's Empowerment Status, 2016 FTFISS*

Table 5.1.1 shows the detailed results of the unadjusted and adjusted WEAI aggregate index and sub-indexes for women in the Feed the Future ZOI.

[67] Large assets include agricultural or non-agricultural land, large or small livestock, agricultural fish pond or fishing equipment, mechanized farm equipment, non-farm business equipment, house or other structures, large consumer durables and means of transportation

**Table 5.1.1: WEAI Score and Women's Empowerment Status, 2016 FTFISS**

| INDICATOR | UNADJUSTED VALUE | ADJUSTED VALUE |
|---|---|---|
| **5DE Score** | **0.92** | **.87** |
| Disempowerment Score (1-5DE) | 0.09 | 0.13 |
| N (number of women in the sample) | 287 | 287 |
| % (women) achieving Empowerment (empowered headcount) | 71.96 | 57.64 |
| % (women) not achieving Empowerment (disempowered headcount) | 28.03 | 42.36 |
| Mean 5DE Score for not yet Empowered women (av. adequacy score) | 0.69 | 0.69 |
| Mean dis-empowerment score (1-5DE) for not yet empowered women (Av. inadequacy score) | 0.30 | 0.30 |
| **GPI Score** | **0.97** | **0.97** |
| N (Number of Dual -adult households) | 185 | 185 |
| % women achieving parity | 77.86 | 73.70 |
| % women not achieving parity | 22.13 | 26.29 |
| Average Empowerment Gap | 0.11 | 0.12 |
| **WEAI SCORE** | **0.92** | **.88** |

Source: Feed the Future Interim Supplemental Survey, Tanzania National Bureau of Statistics (2016) Feed the Future ZOI

Table 5.1.1 shows that the overall **WEAI Score** [the weighted average of the 5DE and the GPI sub-indexes] for the Feed the Future ZOI was 0.92 but dropped to 0.88 after adjusting the adequacy thresholds. The 5DE and GPI scores were:

- **5DE Score**: The adjusted 5DE index value is 0.87. Overall, approximately 57.6 percent of women have achieved adequate empowerment. Those who are not yet empowered (about 41 percent) have a mean 5DE score of 0.69 indicating that women not yet empowered had adequate achievements on average in about 69 percent of the domains.[68] Table 2 shows women's adequacy achievement rates for the WEAI indicators for the baseline.

- **GPI Score:** The adjusted GPI is 0.97, and 73.7 percent of the women in the survey have achieved gender parity. The average empowerment gap between the 26.2 percent of women without gender parity and the adult males in their household is 0.12, which is relatively low**.**

[68] A woman is defined as empowered in the 5DE if she reaches the threshold of empowerment [i.e., if she achieves adequacy] in 80 percent or more of the weighted 5DE indicators.

**Table 5.1.2: Tanzania Women's Adequacy Achievements (% Raw Headcount) on the WEAI 5DE Indicator, 2016 FTFISS**

| Domain | Definition of domain | Indicator | Unadjusted Baseline Values (N:287) | Adjusted Baseline Values (N:287) |
|---|---|---|---|---|
| Production | Sole or joint decision-making over food and cash crop farming, livestock, and fisheries, and autonomy in agricultural production | Input in productive decisions | 99.3 | 99.3 |
| | | Autonomy in production | 79.1 | 79.1 |
| Resources | Ownership, access to, and decision-making power over productive resources such as land, livestock, agricultural equipment, consumer durables, and credit | Ownership of assets | 100.0 | 67.9 |
| | | Purchase, sale or transfer of assets | 92.3 | 92.3 |
| | | Access to and decisions on credit | 62.0 | 62.0 |
| Income | Sole or joint control over income and expenditures | Control over use of income | 99.6 | 99.6 |
| Leadership | Membership in economic or social groups and comfort in speaking in public | Group member | 62.3 | 62.3 |
| | | Speaking in public | 69.6 | 69.6 |
| Time | Allocation of time to productive and domestic tasks and satisfaction with the available time for leisure activities | Workload | 68.6 | 68.6 |
| | | Leisure | 79.7 | 79.7 |

Source: Feed the Future Interim Supplemental Survey, Tanzania National Bureau of Statistics (2016) Feed the Future ZOI

Table 5.1.2 presents the five domains of empowerment measured by the WEAI, their definitions, the corresponding 10 indicators, and the percentage of women who achieved adequacy in the 10 indicators before and after adjusting the adequacy thresholds. The percentages presented in Table 5.1.2 reflect the proportion of all surveyed women with adequacy in individual indicators regardless of their empowerment status (i.e., the uncensored headcount) and not the proportion of surveyed women who are disempowered and achieve adequacy in individual indicators (i.e., the censored headcount). The data indicates that adjusting the adequacy threshold for the indicator control over use of income (from having input in *some* decisions to having input in *most or all decisions* regarding income in one activity) did not change the percentage of women that achieved adequacy in the indicator. The percentage of women that achieved adequacy in the indicator ownership of assets dropped from 100 percent to 67.9% after adjusting the adequacy threshold.

Among women surveyed in the 2016 FTFISS, the adjusted baseline values in Table 5.1.2 suggest that the WEAI indicators with the highest uncensored (or "raw") headcounts (i.e., the greatest achievement of adequacy) were: (i) Input in productive decisions (92.7 percent), (ii) Control over

use of income (91.7 percent), and (iii) Purchase, sale or transfer of assets (92.3 percent). The 5DE indicators with the lowest levels of adequacy achievement and thus those presenting the highest constraints to women's empowerment were: (i) *Access to and decisions on credit* (62.0 percent), and (ii) *Group membership* (62.3 percent), (iii) *Workload* (68.6 percent).

*Comparison of Women's and Men's Empowerment Status*

Figure 5.1.1 compares male and female disempowerment (***censored headcount rates***) across the 10 WEAI indicators and illustrates the contribution of each indicator to disempowerment before and after adjusting the adequacy thresholds for the Control Over the Use of Income and Asset Ownership indicators**.** The figure shows that women are about twice as disempowered as men overall. Across all 10 indicators, men fare better than women. The indicators that make a major contribution to disempowerment for both women and men are group membership and workload. Women are additionally constrained in their ownership of assets, speaking in public, and access to and decisions on credit. Even after adjusting the adequacy threshold for Control Over the Use of Income, this indicator contributes least to both women's and men's disempowerment, followed by input in productive decisions; and purchase, sale or transfer of assets. The indicators exhibiting the greatest gap in male versus female achievement are speaking in public; ownership of assets; and access to and decisions on credit.

Figure 5.1.2 provides a breakdown of women's disempowerment by domain and shows community leadership and access to productive resources account for more than 50 percent of women's disempowerment.

**Figure 5.1.1. Absolute Contribution of Each Indicator to Men's and Women's Disempowerment from the 2016 FTFISS**

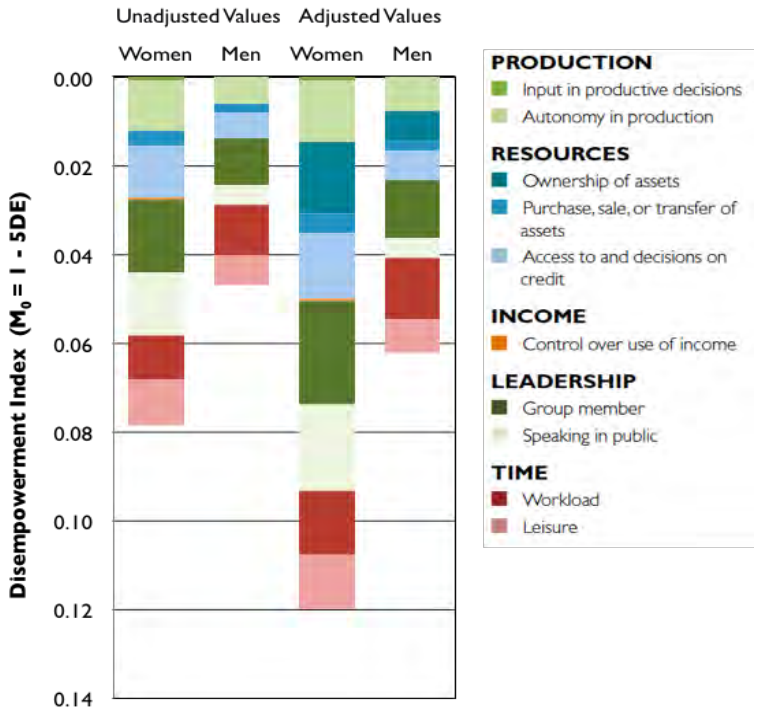
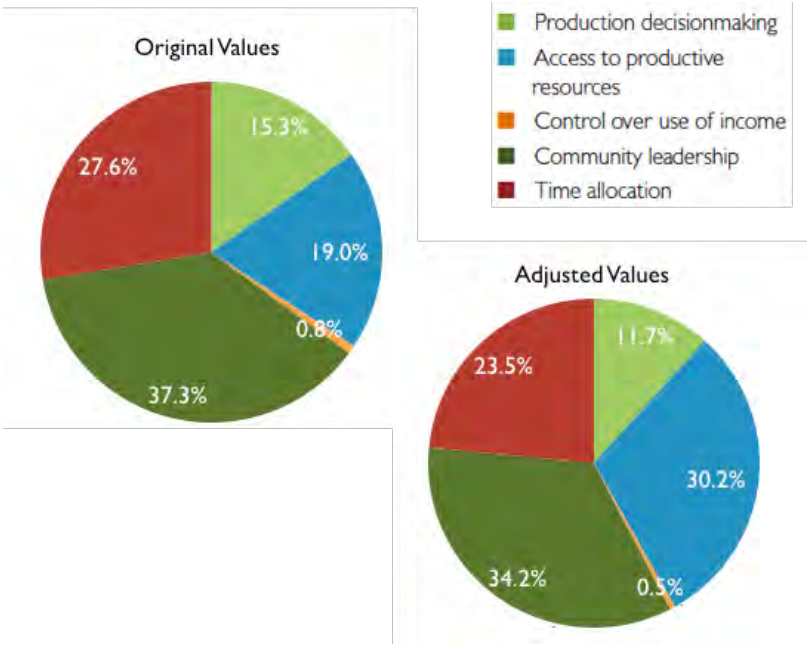



**Figure 5.1.2. Percentage Contribution of Each of the Five Domains to the Disempowerment of Women from the 2016 FTFISS**



### Comparison of WEAI results from three WEAI surveys in Tanzania

To validate the relatively high overall WEAI scores from the Tanzania 2016 FTFISS, IFPRI reviewed findings from two additional studies that also collected the WEAI in Tanzania:[69]

1. The REPOA survey collected WEAI data in 2016 from 1,187 households in 8 regions across Mainland Tanzania including one region (Morogoro) also in the Feed the Future ZOI.[70]

2. The Feed the Future Innovation Lab study of irrigation, gender, and nutrition surveyed 451 households covering 14 villages in the Morogoro region in 2015.[71]

#### *Tanzania WEAI Scores and Women's Empowerment Status*

Table 5.1.3 compares the WEAI aggregate index and sub-indexes for women across the FTFISS, Feed the Future Innovation Lab for Small-Scale Irrigation and the REPOA surveys. The first two columns show the unadjusted and adjusted baseline survey results for women in the Feed the Future ZOI.[72] The third column includes the adjusted results from the Feed the Future Interim Supplemental Survey for the Mainland region Morogoro — the sole region that overlaps all three surveys—however, these scores are based on a small sample of households and should be interpreted with caution. WEAI results from the Feed the Future Innovation Lab and REPOA surveys are listed in the fourth and fifth columns respectively. The REPOA scores shown are for all regions surveyed.

**Table 5.1.3. WEAI Score and Women's Empowerment Status, by Survey**

| Indicator | FTFISS Unadjusted Values | FTFISS Adjusted Values | FTFISS Morogoro Region | Feed the Future Innovation Lab (Morogoro Region) | REPOA (All Regions) |
|---|---|---|---|---|---|
| **5DE score** | **0.92** | **0.87** | **0.83** | **0.86** | **0.82** |
| Disempowerment score (1 – 5DE) | 0.09 | 0.13 | 0.17 | 0.14 | 0.18 |
| *N (number of observations)* | *287* | *287* | *43* | *312* | *1187* |

[69] The recent study published in World Development "Husband and Wife Perspectives on Farm Household Decision-making Authority and Evidence on Intra-household Accord in Rural Tanzania," by Anderson, Reynolds, and Gugerty (2016) is not included in this review because the study focuses on how men and women within the same household perceive the decisionmaking power of their spouse, whereas the WEAI focuses on how an individual perceives their own decisionmaking power.

[70] REPOA Team Tanzania. Baseline Survey Results of the Impact of Cash Transfers on Women's Empowerment, PowerPoint presentation, December 2016.

[71] IFPRI, Preliminary results for Tanzania from the Innovation Lab for Small-scale irrigation.

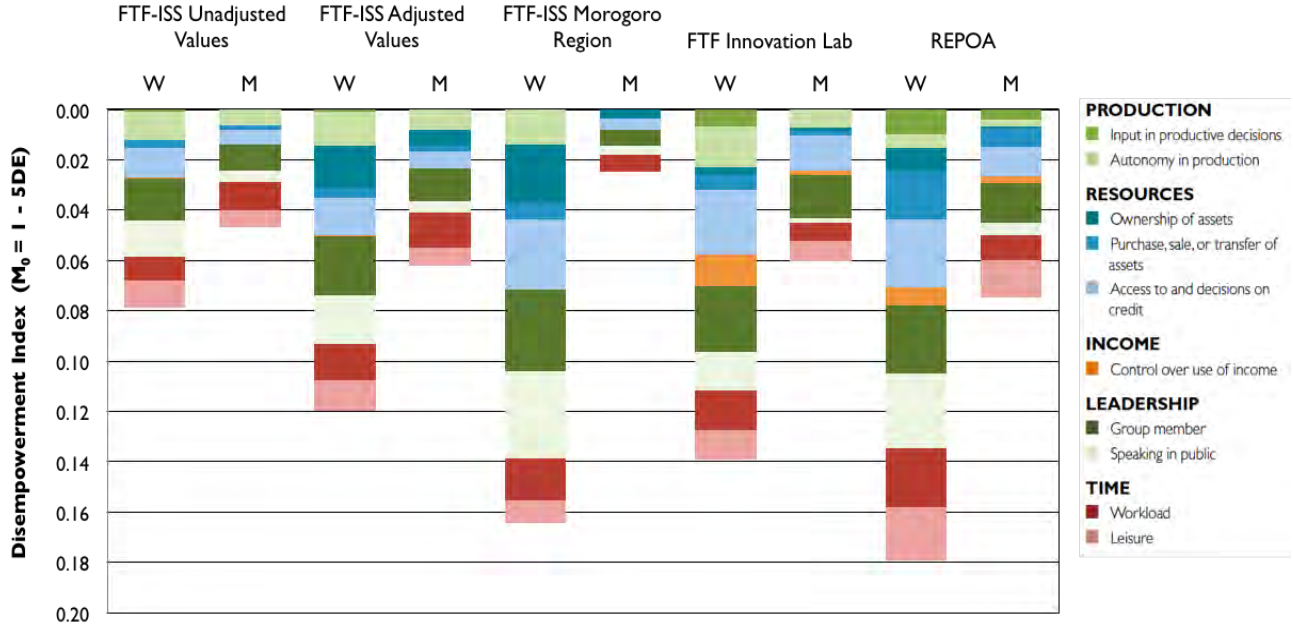
[72] The first set of results used the original adequacy thresholds set for the five WEAI domains. In the second set of WEAI results, the adequacy thresholds were adjusted for two indicators: 1) the adequacy threshold for Control Over the Use of Income changed from having input in some decisions to having input in most or all decisions regarding income in one activity, and 2) the adequacy threshold for Ownership of Land and Assets changed from owning two small assets or one large assets to owning three large assets.

| | | | | | |
|---|---|---|---|---|---|
| % of women achieving empowerment | 72 | 58 | 41 | 60 | 48 |
| % of women not achieving empowerment | 28 | 42 | 59 | 40 | 52 |
| Mean 5DE score for not yet empowered women | 0.70 | 0.69 | 0.71 | 0.65 | 0.65 |
| Mean disempowerment score (1 – 5DE) for not yet empowered women | 0.30 | 0.31 | 0.29 | 0.35 | 0.35 |
| **GPI score** | **0.98** | **0.97** | **0.97** | **0.94** | **0.90** |
| *N (number of dual-adult households)* | *185* | *185* | *24* | *131* | *577* |
| % of women achieving gender parity | 78 | 74 | 60 | 68 | 80 |
| % of women not achieving gender parity | 22 | 26 | 41 | 32 | 20 |
| Average empowerment gap | 0.11 | 0.12 | 0.09 | 0.19 | 0.50 |
| **WEAI score** | **0.92** | **0.88** | **0.84** | **0.87** | **0.83** |

Source: Feed the Future Interim Supplemental Survey, Tanzania National Bureau of Statistics (2016) Feed the Future ZOI; Tanzania Innovation Lab for Small-scale irrigation, Sokoine University of Agriculture (2016); and Tanzania Baseline Survey, REPOA Team Tanzania (2016).

Table 5.1.3 shows that the aggregate and sub-index scores for women in the FTFISS are consistently higher than those in the other two surveys, even after adjusting the adequacy thresholds for the indicators *Control of use of Income* and *Ownership of Land and Assets*. However, aggregate scores for the adjusted Feed the Future Baseline (Col 2) and the Feed the Future Innovation Lab (Col 4) are closely aligned with the exception of the GPI score.

**Figure 5.1.3. Contribution of Each Indicator to Men's and Women's Disempowerment, by Survey**




Source: Feed the Future Interim Supplemental Survey, Tanzania National Bureau of Statistics (2016) Feed the Future ZOI; Tanzania Innovation Lab for Small-scale irrigation, Sokoine University of Agriculture (2016); and Tanzania Baseline Survey, REPOA Team Tanzania (2016).

Figure 5.1.3 compares male and female disempowerment (***censored headcount rates***) in each of the 10 WEAI indicators by survey. The indicators that contribute most to the disempowerment of women and men are consistent across the three WEAI surveys. The greatest contributors to women's disempowerment are group membership, speaking in public and access to and decisions on credit. The indicators contributing most to men's disempowerment are group membership and workload. Control over the use of income is the indicator that contributes least to both women's and men's disempowerment, followed by input in productive decisions; and purchase, sale, or transfer of assets.

# 6. Hunger and Dietary Intake

This section presents findings related to hunger in the ZOI as well as women's and young children's dietary intake.

## 6.1 Household Hunger

The Household Hunger Scale (HHS) is used to calculate the prevalence of households in the Tanzania 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 three different severities of household hunger: 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 (right before the harvest, during the dry season, etc.).[73,74]

The Tanzania ZOI has unimodal seasonality with lean season occurring typically from November to March, rains and green harvest from March to May, and the main Msimu harvest from May to August. Data for the interim HHS was collected during the FTFISS from May to July 2016. This may have resulted in the data underestimating the prevalence of hunger because the data collection coincided with the usual harvest season.

**Table 6.1** presents estimates of household hunger for all households, as well as by household characteristics, including geographic area, gendered household type, household size, and household educational attainment.

Most households in the ZOI report that they experienced little or no hunger (83 percent). This leaves 15.8 percent of households experiencing moderate hunger and 1.1 percent experiencing severe hunger, for a combined total of 16.9 percent of households experiencing any hunger. The relationship between hunger and gendered household type was found to be significant, with female adult(s) only households more likely to feel hunger than households with both male and female adults present. The differences in hunger across household educational attainment was also found to be significant, with households with less than primary educational attainment the most likely to experience hunger, and households attaining secondary education or higher the least likely to experience hunger.

***Table 6.1. Household hunger***

| Characteristic | Percent | | | n[1] |
|---|---|---|---|---|
| | Little to no hunger [a] | Moderate hunger[b] | Severe hunger[c] | |
| **Total (All households)** | **83.0** | **15.8** | **1.1** | **716** |
| **Geographic areas of ZOI** | | | | |
| Zanzibar | 77.8 | 18.6 | 3.6 | 327 |
| Mainland | 83.5 | 15.6 | 0.9 | 389 |
| In Depth Regions | 80.7 | 17.7 | 1.5 | 212 |
| **Gendered household type[2,a,b]** | | | | |
| Male and female adults | 85.8 | 13.4 | 0.8 | 558 |
| Female adult(s) only | 74.1 | 23.5 | 2.4 | 143 |
| Male adult(s) only | ^ | ^ | ^ | 15 |
| **Household size** | | | | |
| Small (1-5 members) | 82.7 | 15.6 | 1.6 | 436 |

[73] Deitschler, Ballard, Swindale, & Coates (2011).
[74] For further description of the household hunger indicator and its calculation, refer to the Feed the Future Indicator Handbook, available at http://feedthefuture.gov/resource/feed-future-handbook-indicator-definitions.

| | | | | |
|---|---|---|---|---|
| Medium (6-10 members) | 83.3 | 16.3 | 0.3 | 267 |
| Large (11+ members) | ^ | ^ | ^ | 13 |
| **Household educational attainment[a,b]** | | | | |
| No education | 78.4 | 17.1 | 4.5 | 38 |
| Less than primary | 73.9 | 23.9 | 2.2 | 73 |
| Primary | 84.4 | 14.9 | 0.7 | 541 |
| Secondary or more | 95.6 | 4.4 | 0.0 | 64 |

^ 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 size may not total to the aggregated sample size.

[2] There are no Children only gendered household type.

[a-b] Significance tests were performed for associations between little to no hunger and household characteristics, which is equivalent to testing the association between moderate to severe hunger and household characteristics. For example, a test was done between little to no hunger and gendered household type. When differences were found to be significant ($p<0.05$), the superscript is noted next to the household characteristic.

Source: Feed the Future Interim Supplemental Survey, May-July 2016

## 6.2 Dietary Intake

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

### 6.2.1 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 (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 previous day by women of reproductive age.

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

#### *Women's Dietary Diversity Score*

The Feed the Future women's dietary diversity indicator, presented in Table 6.2.1.1, 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 consumed is averaged across all women of reproductive age in the sample for whom dietary diversity data were collected to produce a WDDS.

**Table 6.2.1.1** shows the mean and median WDDS for all women of reproductive age in the ZOI, and by individual-level and household-level characteristics. Mean WDDS is the Feed the Future high-level indicator. Individual-level characteristics include women's age groups and educational attainment. Household-level characteristics include categories of geographic area, gendered household type, household size, and household hunger.

In the Tanzania ZOI, the mean value of WDDS is 4.5, meaning that women consume an average of 4.5 food groups out of the nine possible. The median number of food groups consumed is five. Mean WDDS varies significantly by geographic area, age, educational attainment, and household hunger. Women in mainland ZOI regions consume on average one food group more than women in Zanzibar (4.59 food groups versus 3.50 food groups, respectively). While WDD varies significantly by age, there seems to be no consistent pattern to the variation. Women with a secondary education or higher consume well over one food group more (5.25) than women who have no education (4.13) or less than primary education (3.96). Women in households experiencing moderate to severe hunger consume over one food group less than women in households experiencing little or no hunger (3.57 versus 4.68 food groups, respectively).

*Table 6.2.1.1 Women's dietary diversity score*

| Characteristic | Mean [a] | Median | n[1] |
|---|---|---|---|
| **Total (All women 15-49)** | **4.50** | **5** | **853** |
| **Geographic areas of ZOI[a]** | | | |
| Zanzibar | 3.50 | 4 | 465 |
| Mainland | 4.59 | 5 | 388 |
| In Depth Regions | 4.64 | 5 | 238 |
| **Age[a]** | | | |
| 15-19 | 4.50 | 5 | 173 |
| 20-24 | 4.80 | 5 | 153 |
| 25-29 | 4.41 | 4 | 126 |
| 30-34 | 4.62 | 5 | 132 |
| 35-39 | 4.42 | 5 | 105 |
| 40-44 | 4.12 | 4 | 95 |
| 45-49 | 4.40 | 4 | 69 |
| **Educational attainment[a]** | | | |
| No education | 4.13 | 4 | 95 |
| Less than primary | 3.96 | 4 | 111 |
| Primary | 4.63 | 5 | 546 |
| Secondary or more | 5.25 | 5 | 34 |
| **Gendered household type[2]** | | | |
| Male and female adults | 4.57 | 5 | 706 |
| Female adult(s) only | 4.25 | 4 | 139 |
| Male adult(s) only | ^ | ^ | 8 |
| **Household size** | | | |
| Small (1-5 members) | 4.53 | 5 | 418 |
| Medium (6-10 members) | 4.42 | 4 | 409 |
| Large (11+ members) | ^ | ^ | 26 |
| **Household hunger[a]** | | | |
| Little to no hunger | 4.68 | 5 | 703 |
| Moderate or severe hunger | 3.57 | 3 | 147 |

^ 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] There are no Children Only gendered household type.

[a] Significance tests were performed for associations between mean women's dietary diversity score and individual/household characteristics. For example, a test was done between mean women's dietary diversity score and age. When an association is found to be significant ($p<0.05$), the superscript is noted next to the characteristic.

Source: Feed the Future Interim Supplemental Survey, May-July 2016.

### *Women's Minimum Dietary Diversity*

The Feed the Future MDD-W indicator is a new measure introduced in the interim assessments and 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.[75] Achievement of MDD-W is defined as having consumed foods from five 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.[76]

**Table 6.2.1.2** shows the percentage of all women of reproductive age in the ZOI who have achieved the minimum dietary diversity threshold by individual-level and household-level characteristics. Individual-level characteristics include women's age groups and educational attainment. Household-level characteristics include categories of geographic area, gendered household type, household size, and household hunger.

Over half (59.9 percent) of all women in the Tanzania ZOI meet the MDD-W threshold of consuming five food groups. Geographic area, educational attainment, and household hunger are all significantly associated with the MDD-W indicator. Women in mainland ZOI regions have a significantly higher prevalence of meeting the MDD-W threshold than women in Zanzibar (62.2 percent versus 39.6 percent, respectively). Women with primary education and secondary education have higher prevalences of MDD-W than women with no education or less than primary education. Finally, women in households experiencing hunger have a much lower dietary diversity, with only 31.6 percent meeting the five food group threshold, while 65.2 percent of women from households with little or no hunger meet this threshold.

[75] The differences between the nine food groups used for the WDDS (Table 6.2), which is the current standard Feed the Future 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.

[76] For more information, refer to Volume 11: Guidance on the First Interim Assessment of the Feed the Future Zone of Influence Population-Level Indicators (October 2014), Section 4.2, available for download at http://www.feedthefuture.gov/sites/default/files/resource/files/Feed the Future_guidanceseries_vol11_interimassessment_oct2014.pdf.

*Table 6.2.1.2. Women's minimum dietary diversity*

| Characteristic | Percent [a] | n[1] |
|---|---|---|
| **Total (All Women 15-49)** | **59.9** | **853** |
| **Geographic areas of ZOI[a]** | | |
| Zanzibar | 39.6 | 465 |
| Mainland | 62.2 | 388 |
| In Depth Regions | 63.4 | 238 |
| **Age** | | |
| 15-19 | 61.6 | 173 |
| 20-24 | 65.0 | 153 |
| 25-29 | 57.6 | 126 |
| 30-34 | 61.5 | 132 |
| 35-39 | 62.3 | 105 |
| 40-44 | 49.6 | 95 |
| 45-49 | 55.9 | 69 |
| **Educational attainment[a]** | | |
| No education | 49.6 | 95 |
| Less than primary | 37.0 | 111 |
| Primary | 64.2 | 546 |
| Secondary or more | 81.8 | 34 |
| **Gendered household type[2]** | | |
| Male and female adults | 61.6 | 706 |
| Female adult(s) only | 54.1 | 139 |
| Male adult(s) only | ^ | 8 |
| **Household size** | | |
| Small (1-5 members) | 63.2 | 418 |
| Medium (6-10 members) | 54.4 | 409 |
| Large (11+ members) | ^ | 26 |
| **Household hunger[a]** | | |
| Little to no hunger | 65.2 | 703 |
| Moderate or severe hunger | 31.6 | 147 |

^ 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] There are no Children Only gendered household type.

[a] Significance tests were performed for associations between women's minimum dietary diversity and individual/household characteristics. For example, a test was done between women's minimum dietary diversity and age. When an association is found to be significant ($p<0.05$), the superscript is noted next to the characteristic.

Source: Feed the Future Interim Supplemental Survey, May-July 2016.

**Table 6.2.1.3** shows the percentages of women age 15-49 years who consume each of the 10 food groups by dietary diversity achievement status. As defined above, in order to achieve a Minimum Dietary Diversity, women need to have consumed at least five of the ten food groups.

Women who have not achieved MDD will have a less diverse diet. The percentages of consumption of each of the ten food groups, both among women who achieve a minimum dietary diversity and among women who do not, are shown below. Significant differences in patterns of consumption are noted by superscripts.

Women who do not achieve MDD concentrate their consumption in three food groups: grains, roots and tubers, vitamin A rich dark green leafy vegetables, and other fruits. The only food groups for which there is no significant difference in consumption across women who do and women who don't achieve MDD are grains, roots, and tubers, and dairy. Women achieving MDD are significantly more likely to consume all of the remaining food groups than women who don't achieve MDD.

***Table 6.2.1.3 Consumption of foods by women's minimum dietary diversity status***

| Category | Percent of women according to achievement of a minimum dietary diversity [a] | |
|---|---|---|
| | Achieving | Not achieving |
| **Women consuming a specific food group** | | |
| Grains, roots and tubers | 100.0 | 99.8 |
| Legumes and beans[a] | 56.9 | 22.5 |
| Nuts and seeds[a] | 35.1 | 12.8 |
| Dairy products | 26.8 | 8.4 |
| Meat and organ meats[a] | 69.5 | 29.9 |
| Eggs[a] | 10.5 | 3.3 |
| Vitamin A-rich dark green leafy vegetables[a] | 83.3 | 58.4 |
| Other Vitamin A-rich vegetables and fruits[a] | 67.8 | 10.3 |
| Other fruits[a] | 97.6 | 70.4 |
| Other vegetables[a] | 57.4 | 15.1 |
| **N** | **412** | **441** |

[a] Significance tests were performed for associations between women's achievement of minimum dietary diversity and consumption of a specific food group. For example, a test was done between women's achievement of minimum dietary diversity and consumption of grains, roots and tubers. When an association is found to be significant ($p<0.05$), a superscript is noted next to the food group.

Source: Feed the Future Interim Supplemental Survey, May-July 2016.

## 6.2.2 Infant and Young Child Feeding

This section presents young children's dietary intake measures, including the Feed the Future indicators of exclusive breastfeeding among babies 0-5 months and the MAD indicator among children 6-23 months.

### *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 received breast milk (including expressed breast milk or breast milk from a wet nurse) and may have received oral rehydration salts, vitamins, minerals, and/or medicines, but did not receive any other food or liquid. This indicator measures the percentage of children 0-5 months of age who were exclusively breastfed during the day preceding the survey.

**Table 6.2.2.1** shows the prevalence of exclusive breastfeeding among children 0-5 months in the ZOI. Estimates are shown for all children, as well as by geographic area, by children's sex and by educational attainment of the child's mother. The mother's educational categories include no education, less than primary, completed primary, and completed secondary or more.

Among all children less than 6 months in the ZOI, 60.4 percent are exclusively breastfed. This is very similar to the national prevalence of exclusive breastfeeding, as reported in the 2015-16 Tanzania DHS Final Report, at 59.2 percent.[77]

As shown in Table 6.2.2.1, the prevalence of exclusive breastfeeding in mainland regions of the ZOI is significantly higher (65.0 percent) than on Zanzibar (24.6 percent). There is no significant association between exclusive breastfeeding and either child sex or mother's educational attainment.

***Table 6.2.2.1 Prevalence of exclusive breastfeeding among children under 6 months***

| Characteristic | Percent [a] | n[1] |
|---|---|---|
| **Total (All children under 6 months)** | **60.4** | **273** |
| **Geographic area of ZOI[a]** | | |
| Zanzibar | 24.6 | 137 |
| Mainland | 65.0 | 136 |
| In Depth Regions | 59.4 | 92 |
| **Child sex** | | |
| Male | 66.3 | 131 |
| Female | 54.6 | 142 |
| **Mother's educational attainment** | | |
| No education | 59.9 | 46 |
| Less than primary | 52.5 | 38 |
| Primary | 60.7 | 150 |
| Secondary or more | 67.2 | 39 |

[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.

[a] Significance tests were performed for associations between exclusive breastfeeding and child/mother's characteristics. For example, a test was done between exclusive breastfeeding and the child's sex. When an association is found to be significant ($p<0.05$), the superscript is noted next to the characteristic.

Source: Tanzania DHS, 2015-16.

[77] MoHCDGEC et. al. 2016.

### *Minimum Acceptable Diet*

The prevalence of children 6-23 months receiving a MAD measures the proportion of young children who receive a MAD apart from breastfeeding. This composite indicator measures both the minimum feeding frequency and minimum dietary diversity based on mother's reports of the frequency with which the child was fed in the past 24 hours, and what foods were consumed during the past 24 hours. Tabulation 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 6.2.2.2** presents the Feed the Future MAD indicator for children in the ZOI. Estimates are shown for all children, as well as by characteristics of the children, mother, and household. Children's characteristics include children's sex and age group. Mothers' characteristics include age as well as educational attainment. Household characteristics include geographic area, gendered household type, household size, and household hunger.

Only 7.2 percent of children age 6-23 months in the ZOI received a MAD. This is lower than the national average of 10.0 percent.[78] Zanzibar has a higher prevalence of MAD (11.6 percent) than mainland ZOI (6.6 percent), though this difference is significant only at the 10% level. MAD is significantly associated with child age, with children age 12-17 months having higher prevalence of MAD (11.1 percent) than those younger (6-11 months, 5.5 percent) and older (18-23 months, 5.4 percent). MAD is significantly associated with mother's educational attainment. Children whose mother has completed primary education have a higher prevalence of MAD, at 7.1 percent, than children whose mothers have no education or less than primary education (1.9 and 1.8 percent MAD respectively). Children whose mothers have completed secondary education or more have much higher MAD (21.4 percent). There is no significant association between prevalence of MAD and child sex, gendered household type, or household size.

***Table 6.2.2.2 Percentage of children age 6-23 months who receive a minimum acceptable diet***

| Characteristic | Percent [a] | n[1] |
|---|---|---|
| **Total (All children 6-23 months)** | **7.2** | **891** |
| **Geographic area of ZOI** | | |
| Zanzibar | 11.6 | 461 |
| Mainland | 6.6 | 430 |
| In Depth Regions | 6.1 | 277 |
| **Child sex** | | |
| Male | 7.7 | 432 |
| Female | 6.7 | 459 |

[78] MoHCDGEC et. al. 2016.

| | | |
|---|---|---|
| **Child age[a]** | | |
| 6-11 months | 5.5 | 306 |
| 12-17 months | 11.1 | 297 |
| 18-23 months | 5.4 | 288 |
| **Mother's educational attainment[a]** | | |
| No education | 1.9 | 172 |
| Less than primary | 1.8 | 93 |
| Primary | 7.1 | 476 |
| Secondary or more | 21.4 | 150 |
| **Gendered household type[2]** | | |
| Male and female adults | 6.5 | 811 |
| Female adult(s) only | 10.9 | 73 |
| **Household size** | | |
| Small (1-5 members) | 7.8 | 403 |
| Medium (6-10 members) | 6.7 | 443 |
| Large (11+ members) | 4.7 | 45 |

[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] There are no "Children only" and only seven "Male adult only" gendered household types. The sample size for both groups is too small to obtain valid estimates.

[a] Significance tests were performed for associations between children receiving a minimum acceptable diet and child/mother/household characteristics. For example, a test was done between children receiving a minimum acceptable diet and child's sex. When an association is found to be significant ($p<0.05$), the superscript is noted next to the characteristic.

Source: Tanzania DHS 2015-16.

**Table 6.2.2.3** presents the percentage of children achieving the MAD components (e.g., minimum meal frequency, minimum dietary diversity) and consuming each of the food groups of the minimum dietary diversity indicator. Estimates are shown for all children, as well as by specific age groups, and presented separately for breastfed children and non-breastfed children.

***Table 6.2.2.3 Components of a minimum acceptable diet among children age 6-23 months***

| | Percent | | | |
|---|---|---|---|---|
| | | By child age (in months)[b] | | |
| MAD components and food groups | All children[a] | 6 to 11 | 12 to 17 | 18 to 23 |
| **Breastfed children** | | | | |
| Achieving minimum meal frequency[a] | 32.7 | 33.5 | 31.7 | 32.4 |
| Achieving minimum dietary diversity[b] | 19.9 | 14.2 | 24.8 | 22.9 |
| **Consuming:** | | | | |
| Grains, roots, and tubers[b] | 85.7 | 81.9 | 90.1 | 86.1 |
| Legumes and nuts | 29.5 | 26.6 | 34.9 | 26.5 |
| Dairy products | 25.4 | 26.7 | 24.8 | 23.9 |
| Flesh foods[a,b] | 23.6 | 18.2 | 31.7 | 21.1 |
| Eggs[b] | 5.5 | 4.1 | 8.3 | 3.8 |
| Vitamin A-rich fruits and vegetables[a,b] | 59.3 | 49.3 | 67.1 | 66.4 |

| | | | | |
|---|---|---|---|---|
| Other fruits and vegetables[b] | 19.7 | 20.6 | 14.8 | 25.4 |
| **N** | **745** | **298** | **275** | **172** |
| **Non-breastfed children** | | | | |
| Achieving minimum meal frequency[a] | 19.1 | ^ | ^ | 18.5 |
| Achieving minimum milk feeding frequency | 13.1 | ^ | ^ | 12.3 |
| Achieving minimum dietary diversity | 29.5 | ^ | ^ | 28.6 |
| **Consuming:** | | | | |
| Grains, roots, and tubers | 89.5 | ^ | ^ | 88.3 |
| Legumes and nuts | 34.7 | ^ | ^ | 33.5 |
| Dairy products | 25.5 | ^ | ^ | 25.6 |
| Flesh foods[a] | 51.1 | ^ | ^ | 51.4 |
| Eggs | 12.9 | ^ | ^ | 13.2 |
| Vitamin A-rich fruits and vegetables[a] | 83.3 | ^ | ^ | 83.8 |
| Other fruits and vegetables | 23.7 | ^ | ^ | 23.4 |
| **N** | **146** | **8** | **22** | **116** |

^ Results not statistically reliable, n<30.

[a-b] Significance tests were performed for associations between MAD components/food groups for breastfed and non-breastfed children. For example, a test was done for achieving minimum meal frequency and breastfeeding status. Significance tests were also performed for associations between MAD components/food groups with child's age. When an association is found to be significant ($p<0.05$), a superscript is noted next to the breastfed and non-breastfed row headings corresponding to the MAD component/food group.

Source: Tanzania DHS 2015-16

Table 6.2.2.3 shows that among breastfed children, 32.7 percent achieve minimum meal frequency and 19.9 percent achieve minimum dietary diversity. Among non-breastfed children, of which there are many fewer (n=146), a significantly lower percentage achieve minimum meal frequency (19.1 percent) and a higher but not significantly different percentage achieve minimum dietary diversity (29.5 percent). Achieving minimum dietary diversity varies significantly by age among breastfed children, with a lower percentage of 6-11 month children achieving it (14.2 percent) than older children.

The two most common food groups for both breastfed and non-breastfed children are grains roots and tubers (85.7 percent and 89.5 percent, respectively) and vitamin A rich fruits and vegetables (59.3 percent and 83.3 percent, respectively). Over half of all non-breastfed children also consume flesh foods (51.1 percent). The least commonly consumed food group among both breastfed and non-breastfed children is eggs. Non-breastfed children consume significantly more flesh foods and vitamin A rich fruits and vegetables than breastfed children. Among breastfed children, the consumption of grains, roots and tubers, flesh foods, eggs, vitamin A rich fruits and vegetables, and other fruits and vegetables vary significantly by age. In all but one case (other fruits and vegetables), the middle age group consumes significantly more than the other age groups.

# 7. Nutritional Status of Women and Children

This section presents findings related to the Feed the Future indicators of women's underweight and children's anthropometry (stunting, wasting, and underweight).

## 7.1 Body Mass Index of Women Age 15-49 Years

**Table 7.1** presents women's mean Body Mass Index (BMI) as well as the BMI categories of 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 age 15-49, as well as disaggregated by individual-level and household-level characteristics. Individual characteristics include age and educational attainment. Household characteristics include gendered household type, household size, and household hunger.

Among all non-pregnant women age 15-49 in the Tanzania ZOI, mean BMI is 23.6, or normal weight. This is nearly identical to the national average BMI of 23.4.[79] The prevalence of underweight women in the ZOI is 8.3 percent, slightly lower than the 2015-16 DHS national prevalence of 9.5 percent.[80] The percentage of women of normal weight in the ZOI, 61.0 percent, is slightly lower than the national percentage (62.1 percent).[81] The prevalence of overweight and obese among women is slightly higher in the ZOI (20.5 and 10.2 percent, respectively) than in the nation as a whole (18.4 and 10.0 percent, respectively).[82]

As shown in Table 7.1, mean BMI and BMI category vary significantly by geographic area, age, educational attainment, and household size. Women of reproductive age in Zanzibar have a significantly higher mean BMI than those in mainland ZOI. They are also significantly less likely to be of normal weight, with 49.1 percent of normal weight on Zanzibar and 62.8 percent of normal weight in mainland ZOI. Women of reproductive age from Zanzibar are significantly more likely to be underweight (prevalence of 11.8 percent in Zanzibar versus 7.8 percent in mainland ZOI) and obese (prevalence of 17.3 percent in Zanzibar versus 9.1 percent in mainland ZOI).

Highly educated women (secondary education or higher) have a lowest prevalence of underweight (6.5 percent) as well as the highest prevalence of overweight (23.5 percent) and obese (22.1 percent) when compared to women with lower educational attainment. Likewise, women from the smallest households have the lowest prevalence of underweight (6.7 percent) and the highest prevalence of overweight (23.5 percent) when to compared to women from medium and larger households.

[79] MoHCDGEC et. al. 2016.
[80] MoHCDGEC et. al. 2016.
[81] MoHCDGEC et. al. 2016.
[82] MoHCDGEC et. al. 2016.

*Table 7.1. Prevalence of underweight, normal weight, overweight, and obese women*

| Characteristic | Mean BMI[a] | Body Mass Index (BMI) category (percent) [b] Under weight[b] | Normal weight[c] | Over weight[d] | Obese[e] | n[1] |
|---|---|---|---|---|---|---|
| **Total (All women age 15-49)** | **23.6** | **8.3** | **61.0** | **20.5** | **10.2** | **3629** |
| **Geographic areas of ZOI[a,b,c,e]** | | | | | | |
| Zanzibar | 24.6 | 11.8 | 49.1 | 21.8 | 17.3 | 1955 |
| Mainland | 23.5 | 7.8 | 62.8 | 20.3 | 9.1 | 1674 |
| In Depth Regions | 23.1 | 9.7 | 63.2 | 20.2 | 6.9 | 1022 |
| **Age[a,b,c,d,e]** | | | | | | |
| 15-19 | 21.5 | 15.8 | 73.2 | 9.0 | 2.0 | 839 |
| 20-24 | 22.9 | 8.1 | 67.2 | 18.2 | 6.7 | 642 |
| 25-29 | 24.0 | 6.2 | 59.7 | 24.0 | 10.0 | 538 |
| 30-34 | 24.5 | 4.3 | 59.0 | 23.3 | 13.3 | 452 |
| 35-39 | 24.4 | 6.3 | 55.8 | 24.7 | 13.2 | 417 |
| 40-44 | 24.9 | 7.5 | 50.0 | 24.3 | 18.2 | 379 |
| 45-49 | 25.3 | 5.2 | 48.6 | 29.9 | 16.3 | 362 |
| **Educational attainment[a,b,c,d,e]** | | | | | | |
| No education | 22.7 | 8.5 | 67.2 | 19.6 | 4.7 | 485 |
| Less than primary | 22.1 | 12.2 | 70.7 | 11.7 | 5.4 | 383 |
| Primary | 23.7 | 8.1 | 60.9 | 21.4 | 9.6 | 2111 |
| Secondary or more | 25.4 | 6.5 | 47.9 | 23.5 | 22.1 | 650 |
| **Gendered household type[2]** | | | | | | |
| Male and female adults | 23.6 | 8.6 | 60.8 | 20.3 | 10.3 | 3164 |
| Female adult(s) only | 24.0 | 6.3 | 61.0 | 22.5 | 10.3 | 442 |
| Male adult(s) only | ^ | ^ | ^ | ^ | ^ | 23 |
| **Household size[a,b,d]** | | | | | | |
| Small (1-5 members) | 24.0 | 6.7 | 59.2 | 23.5 | 10.6 | 1587 |
| Medium (6-10 members) | 23.3 | 10.3 | 63.1 | 16.9 | 9.7 | 1805 |
| Large (11+ members) | 23.2 | 9.3 | 61.7 | 19.2 | 9.8 | 237 |

^ 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] There are no children only households.

[a-c] A superscript in the column heading indicates significance tests were performed for associations between the indicator in the column heading and each of the variables in the rows. For example, a test was done between BMI and the woman's age. When an association between the column indicator and row variable is found to be significant ($p<0.05$), the superscript for the indicator in the column heading is noted next to the row variable.

Source: Tanzania DHS, 2015-16

## 7.2 Stunting, Wasting, and Underweight among Children Under 5 Years

This section reports on three anthropometric measurements of undernutrition among children under 5 years in the ZOI: stunting (height-for-age), wasting (weight-for-height), and underweight (weight-for-age).

### 7.2.1 Stunting (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 (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 (HAZ) more than two standard deviations (SD) below the median of the 2006 WHO Child Growth Standard (<-2SD).[83] The stunting measures presented below include the Feed the Future stunting indicator of moderate or severe stunting combined (<-2SD) as well as the indicator for severe stunting (<-3SD). Mean Z-scores are also presented.

**Table 7.2.1** shows the prevalence of stunting, severe stunting, and mean Z-scores for children under 5 years in the ZOI. Estimates are presented for all children and by child, mother, and household characteristics. Children's characteristics include sex and age. Mothers' characteristics include educational attainment. Household characteristics include geographic area, gendered household type, and household size.

In the Tanzania ZOI, over one-third (35.2 percent) of children are stunted. This is slightly higher than the 2015-16 DHS national prevalence of stunting of 34.4 percent.[84] Just over 1 in 10 (10.8 percent) of children in the ZOI are severely stunted, compared to 11.7 percent nationally.[85] The mean height-for-age Z-score in the ZOI is -1.51.

Table 7.2.1 shows that the prevalence of stunting and severe stunting as well as height-for-age mean Z-scores vary significantly across child characteristics of sex and age. Male children experience higher prevalence of stunting and severe stunting than female children, and have a significantly lower height-for-age mean Z-score. Prevalence of stunting and severe stunting is the lowest in the youngest age group (0-11 months), rises significantly in the next oldest age group (12-23 months), peaking at ages 24-35 months, and then declining slightly in the oldest

[83] WHO. (2006).
[84] MoHCDGEC et. al. 2016.
[85] MoHCDGEC et. al. 2016.

age groups. The prevalence of stunting and severe stunting for 24-35 month olds in the ZOI is 46.2 percent and 16.6 percent respectively.

The prevalence of stunting and severe stunting as well as height-for-age Z-scores also vary significantly across mother's educational attainment. Mothers attaining secondary education or higher have children with lowest prevalence of stunting (23.8 percent) and severe stunting (5.3 percent) as well as the HAZ closest to zero, or the reference population (-1.24), when compared to children whose mothers have lower educational attainment.

Finally, stunting levels and height-for-age Z-scores are significantly associated with the household level characteristics of geographic area and household size. Children on Zanzibar have much lower prevalence of stunting when compared to mainland ZOI children (23.0 percent on Zanzibar compared to 37.0 percent in mainland ZOI). The prevalence of severe stunting is also significantly lower on Zanzibar (6.5 percent) than in mainland ZOI (11.5 percent). Rates of stunting and severe stunting fall significantly and HAZ scores come closer to the reference population with increasing household size.

*Table 7.2.1 Stunting (height-for-age) among children under 5 years old*

| Characteristic | % Stunted (< 2 SD)[a] | % Severely stunted (< 3 SD)[b] | Mean Z score [c] | n[1] |
|---|---|---|---|---|
| **Total (All children under 5 years)** | **35.2** | **10.9** | **-1.51** | **2851** |
| **Geographic areas of ZOI[a,b,c]** | | | | |
| Zanzibar | 23.0 | 6.5 | -1.13 | 1526 |
| Mainland | 37.0 | 11.5 | -1.57 | 1325 |
| In Depth Regions | 35.8 | 10.8 | -1.58 | 859 |
| **Child sex[a,b,c]** | | | | |
| Male | 39.5 | 12.5 | -1.61 | 1397 |
| Female | 30.7 | 9.1 | -1.41 | 1454 |
| **Child age[a,b,c]** | | | | |
| 0-11 months | 15.6 | 3.6 | -0.75 | 582 |
| 12-23 months | 41.1 | 13.3 | -1.72 | 622 |
| 24-35 months | 46.2 | 16.6 | -1.84 | 542 |
| 36-47 months | 39.6 | 10.9 | -1.66 | 515 |
| 48-59 months | 35.3 | 10.6 | -1.64 | 590 |
| **Mother's educational attainment[2,a,b,c]** | | | | |
| No education | 38.4 | 10.4 | -1.53 | 551 |
| Less than primary | 37.6 | 14.4 | -1.63 | 323 |
| Primary | 36.1 | 11.1 | -1.55 | 842 |
| Secondary or more | 23.8 | 5.3 | -1.24 | 880 |
| **Gendered household type[3]** | | | | |
| Male and female adults | 34.7 | 10.9 | -1.51 | 2577 |
| Female adult(s) only | 39.5 | 10.7 | -1.56 | 258 |
| Male adult(s) only | ^ | ^ | ^ | 16 |
| **Household size[a,b,c]** | | | | |
| Small (1-5 members) | 37.9 | 12.1 | -1.56 | 1178 |
| Medium (6-10 members) | 33.1 | 10.2 | -1.49 | 1493 |
| Large (11+ members) | 26.7 | 4.3 | -1.22 | 180 |

^ 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 Tanzania DHS includes mother's educational attainment alongside child's information. We will assume that in the great majority of cases the mother is the primary caregiver.

[3] There are no children under age 5 found in "children only" gendered household type.

[a-c] A superscript in the column heading indicates significance tests were performed for associations between the indicator in the column heading and each of the variables in the rows. For example, a test was done between percent stunted and the child's sex. When an association between the column indicator and row variable is found to be significant ($p<0.05$), the superscript for the indicator in the column heading is noted next to the row variable.

Source: Tanzania DHS 2015-16

### 7.2.2 Wasting (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. This indicator measures the percentage of children 0-59 months who are acutely malnourished, as defined by a weight-for-height Z-score (WHZ) more than two SD below the median of the 2006 WHO Child Growth Standard. The wasting measures presented below include the Feed the Future wasting indicator of moderate or severe wasting combined (<-2SD) as well as the indicator for severe wasting (<-3SD), and the percentage of children who are overweight (>+2SD) and obese (>+3SD). Mean Z-scores are also presented.

**Table 7.2.2** shows the prevalence of wasting, severe wasting, overweight, obesity, and mean Z-scores for children under 5 years in the ZOI. Estimates are presented for all children and by child, mother, and household characteristics. Children's characteristics include sex and age. Mothers' characteristics include educational attainment. Household characteristics include geographic area, gendered household type, and household size.

In the Tanzania ZOI, 5.3 percent of children are wasted, slightly higher than the 2015-16 DHS national prevalence of wasting of 4.5 percent.[86] Prevalence of severe wasting (<-3SD) in the ZOI is 1.1 percent, which is nearly identical to the 2015-16 DHS national value of 1.2 percent severely wasted.[87] The prevalence of overweight (>2SD) in the ZOI is 4.5 percent, higher than the 2015-16 DHS national rate of 3.6 percent overweight. The weight-for-height mean Z-score in the ZOI is -0.06, which is just below the reference population.

Table 7.2.2 shows the prevalences of wasting, severe wasting, overweight and obese, along with weight-for-height mean Z-score vary significantly by child's age, with the youngest age group having higher rates of wasting, severe wasting, as well as overweight and obese. The weight-for-age mean Z-score is significantly lower for males than for females. There are no significant differences across maternal educational attainment.

There are significant geographical differences in percentage of overweight children and WHZ scores, with children on Zanzibar less likely to be overweight and having lower WZH scores than children in mainland ZOI. Children in male-and-female adult households are more than twice as likely to be wasted as those in female-adult(s) only households. Finally, children in small households are less likely to be wasted and children than those in medium and large households. Children in large households are less likely to be overweight and have significantly lower WHZ scores than children in smaller households.

[86] MoHCDGEC et. al. 2016.
[87] MoHCDGEC et. al. 2016.

*Table 7.2.2 Wasting (weight-for-height) among children under 5 years old*

| Characsteristic | % Wasted (< 2 SD) [a] | % Severely wasted (< 3 SD)[b] | % Overweight (> +2SD) [c] | % Obese (> +3SD)[d] | Mean Z score [e] | n[1] |
|---|---|---|---|---|---|---|
| **Total (All children under 5 years)** | **5.3** | **0.9** | **4.5** | **0.9** | **-0.06** | **2851** |
| **Geographic Areas of ZOI[c,e]** | | | | | | |
| Zanzibar | 6.8 | 1.1 | 2.6 | 0.7 | -0.33 | 1526 |
| Mainland | 5.1 | 0.9 | 4.8 | 0.9 | -0.02 | 1325 |
| In Depth Regions | 5.6 | 1.1 | 2.8 | 0.8 | -0.12 | 859 |
| **Child gender[e]** | | | | | | |
| Male | 5.9 | 0.9 | 4.1 | 0.7 | -0.11 | 1397 |
| Female | 4.7 | 0.9 | 5.0 | 1.1 | 0.00 | 1454 |
| **Child age[a,b,c,d,e]** | | | | | | |
| 0-11 months | 10.1 | 2.0 | 10.6 | 2.8 | 0.04 | 582 |
| 12-23 months | 4.7 | 0.2 | 3.2 | 0.8 | -0.10 | 622 |
| 24-35 months | 2.9 | 0.2 | 3.8 | 0.1 | 0.05 | 542 |
| 36-47 months | 4.9 | 1.8 | 2.4 | 0.2 | -0.14 | 515 |
| 48-59 months | 3.7 | 0.4 | 2.3 | 0.2 | -0.13 | 590 |
| **Mother's educational attainment[2]** | | | | | | |
| No education | 5.2 | 1.4 | 3.5 | 0.9 | -0.16 | 551 |
| Less than primary | 6.9 | 1.0 | 3.0 | 1.7 | -0.11 | 323 |
| Primary | 6.1 | 0.9 | 5.0 | 0.7 | -0.04 | 842 |
| Secondary or more | 3.9 | 0.3 | 5.4 | 0.8 | -0.01 | 880 |
| **Gendered household type [3,a]** | | | | | | |
| Male and female adults | 5.7 | 1.0 | 4.5 | 0.9 | -0.06 | 2577 |
| Female adult(s) only | 2.3 | 0.3 | 5.1 | 0.6 | 0.00 | 258 |
| Male adult(s) only | ^ | ^ | ^ | ^ | ^ | 16 |
| **Household size[a,d,e]** | | | | | | |
| Small (1-5 members) | 4.0 | 0.6 | 4.6 | 0.3 | -0.03 | 1178 |
| Medium (6-10 mmbers) | 6.6 | 1.3 | 4.6 | 1.5 | -0.06 | 1493 |
| Large (11+ members) | 5.6 | 0.6 | 2.9 | 0.5 | -0.33 | 180 |

^ 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 Tanzania DHS includes mother's educational attainment alongside child's information. We will assume that in the great majority of cases the mother is the primary caregiver.

[3] There are no children under age 5 found in "children only" gendered household type.

[a-e] A superscript in the column heading indicates significance tests were performed for associations between the indicator in the column heading and each of the variables in the rows. For example, a test was done between the percent wasted and the child's sex. When an association between the column indicator and row variable is found to be significant (p<0.05), the superscript for the indicator in the column heading is noted next to the row variable.

Source: Tanzania DHS 2015-16

### 7.2.3 Underweight (Weight-for-Age)

*Underweight* is a weight-for-age measurement and is a reflection of acute and/or chronic undernutrition. 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 SD below the median of the 2006 WHO Child Growth Standard. The underweight measures presented below include the Feed the Future underweight indicator of moderate or severe underweight combined (<-2SD) as well as the indicator for severe underweight (<-3SD). Mean Z-scores are also presented.

**Table 7.2.3** shows the prevalence of underweight, severe underweight, and mean Z-scores for children under 5 years in the ZOI. Estimates are presented for all children and by child, mother, and household characteristics. Children's characteristics include sex and age. Mothers' characteristics include educational attainment. Household characteristics include geographic area, gendered household type, and household size.

In the Tanzania ZOI, 13.5 percent of children are underweight. This is nearly identical to the 2015-16 DHS national value of 13.7 percent.[88] The prevalence of severe underweight (<-3SD) is 2.4 percent, nearly identical to the national value of 2.7 percent.[89] The mean weight-for-age Z-score (WAZ) is -0.90.

As shown in Table 7.2.3, children's age is significantly associated with prevalence of underweight, severe underweight and mean weight-for-age Z-scores. Mean weight-for-age Z-scores are also significantly associated with children's sex, male children having significantly lower WAZ scores than female children. Underweight prevalence and Z-scores also varies significantly by maternal educational attainment. Children with mothers who have attained secondary education or higher have the lowest prevalence of underweight at 7.6 percent, the lowest prevalence of severe underweight at 1.1 percent, and the highest WAZ score of -0.68.

Prevalence of underweight, severe underweight, and associated Z-scores are not significantly associated with geographic region or household size. The only significant association with gendered household type is that children from male and female adult households are more than three times as likely to be severely underweight than children from female-adult(s) only households.

[88] MoHCDGEC et. al. 2016.
[89] MoHCDGEC et. al. 2016.

*Table 7.2.3 Underweight (weight-for-age) among children under 5 years old*

| Characteristic | % Underweight (< 2 SD)[a] | % Severely underweight (< 3 SD)[b] | Mean Z score [c] | n[1] |
|---|---|---|---|---|
| **Total ZOI (All children under 5 years)** | **13.5** | **2.4** | **-0.90** | **2851** |
| **Geographic areas of ZOI** | | | | |
| Zanzibar | 13.2 | 2.5 | -0.87 | 1526 |
| Mainland | 13.5 | 2.4 | -0.90 | 1325 |
| In Depth Regions | 14.6 | 2.5 | -0.96 | 859 |
| **Child sex[c]** | | | | |
| Male | 14.3 | 2.8 | -0.98 | 1397 |
| Female | 12.6 | 2.0 | -0.81 | 1454 |
| **Child age[a,b,c]** | | | | |
| 0-11 months | 10.0 | 2.2 | -0.48 | 582 |
| 12-23 months | 15.9 | 4.0 | -0.91 | 622 |
| 24-35 months | 13.2 | 2.2 | -0.97 | 542 |
| 36-47 months | 13.3 | 1.4 | -1.06 | 515 |
| 48-59 months | 15.0 | 2.1 | -1.09 | 590 |
| **Mother's educational attainment[2,a,b,c]** | | | | |
| No education | 14.6 | 3.5 | -0.98 | 551 |
| Less than primary | 14.9 | 4.8 | -1.02 | 323 |
| Primary | 14.2 | 2.1 | -0.90 | 842 |
| Secondary or more | 7.6 | 1.1 | -0.68 | 880 |
| **Gendered household type[3,b]** | | | | |
| Male and female adults | 13.5 | 2.6 | -0.90 | 2577 |
| Female adult(s) only | 13.7 | 0.8 | -0.90 | 258 |
| Male adult(s) only | ^ | ^ | ^ | 16 |
| **Household size** | | | | |
| Small (1-5 members) | 14.1 | 2.7 | -0.91 | 1178 |
| Medium (6-10 members) | 13.0 | 2.3 | -0.88 | 1493 |
| Large (11+ members) | 12.3 | 0.4 | -0.94 | 180 |

^ 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 Tanzania DHS includes mother's educational attainment alongside child's information. We will assume that in the great majority of cases the mother is the primary caregiver.

[3] There are no children under age 5 found in "children only" gendered household type.

[a-c] A superscript in the column heading indicates significance tests were performed for associations between the indicator in the column heading and each of the variables in the rows. For example, a test was done between the percent underweight and the child's sex. When an association between the column indicator and row variable is found to be significant (p<0.05), the superscript for the indicator in the column heading is noted next to the row variable.

Source: Tanzania DHS, 2015-16

## 7.3 Anemia

Anemia, characterized by a low level of hemoglobin in the blood, is a major health problem in Tanzania among young children and pregnant women. The most common cause of anemia is nutritional resulting from inadequate dietary intake of nutrients necessary for synthesis of hemoglobin, such as iron, folate, vitamin B12, or other nutrients. Anemia also results from sickle cell disease, malaria, or parasitic infections.[90]

### 7.3.1 Anemia in Women age 15-49 Years

Hemoglobin levels were collected for all women of reproductive age, 15-49 years old, in the TDHS. The hemoglobin level, adjusted for differences in altitude and smoking status, is already in the publicly available dataset as are dummy variables indicating different levels of anemia. A variable indicating the presence of any anemia (mild, moderate or severe, all Hg<12 for non pregnant women, Hg<11 for pregnant women) was created. The prevalence of any anemia along with the various categories of anemia and mean hemoglobin levels are summarized disaggregating by geographic area, age, educational attainment, gendered household type and household size (Table 7.3.1).

Among all women age 15-49 in the Tanzania ZOI, mean Hemoglobin (Hg, g/dL) is 12.2. The prevalence of anemia in women in the ZOI is 36.9 percent, notably lower than the 2015-16 DHS national prevalence of 44.8 percent.[91] The percentage of women with mild anemia in the ZOI is 29.1 percent, slightly lower than the national prevalence of mild anemia at 32.8 percent.[92] The prevalence of moderate and severe anemia among women is lower in the ZOI (7.1 and 0.8 percent, respectively) than in the nation as a whole (11.1 and 0.9 percent, respectively).[93]

As shown in Table 7.3.1, mean hemoglobin levels and anemia category vary significantly by geographic area, pregnancy status, educational attainment, and household size. Women of reproductive age on Zanzibar have a significantly lower mean hemoglobin levels (11.4 g/dL) than those in mainland ZOI (12.3 g/dL). Women on Zanzibar are also significantly more likely to be anemic (60.1 percent) than women in mainland ZOI (33.4 percent). This significant geographic difference holds for all categories of anemia: mildly anemic, moderately anemic, and severely anemic. As household size gets larger, women's hemoglobin levels go down and prevalence of any anemia and mild anemia go up. Hemoglobin levels and prevalence of any category of anemia do not vary significantly by gendered household type.

Pregnant women have lower hemoglobin levels and higher prevalence of any anemia (44.6 percent) and moderate anemia (19.7 percent) than non-pregnant women (36.2 and 6.0 percent

[90] NBS. 2011a. TDHS 2010 Final Report. p175.
[91] MoHCDGEC et. al. 2016.
[92] MoHCDGEC et. al. 2016.
[93] MoHCDGEC et. al. 2016.

respectively). Women with no education have a significantly higher prevalence of any anemia (46.4 percent) and mild anemia (36.8 percent) than women with higher levels of education. Women with less than primary education have the highest prevalence of moderate anemia (10.3 percent) than those with other educational levels.

***Table 7.3.1. Prevalence of anemia in women***

| Characteristic | Mean Hg[a] (g/dl) | Prevalence Anemia (percent)[b] Any anemia[b] (NP<12.0 g/dl P<11.0 g/dl) | Mildly anemic[c] (NP 10.0 11.9 g/dl, P 10.0 10.9 g/dl) | Moderately Anemic[d] (NP & P 7.0 9,9 g/dl) | Severely Anemic[e] (P & NP <7.0 g/dl) | n[1] |
|---|---|---|---|---|---|---|
| **Total (All women age 15-49)** | **12.2** | **36.9** | **29.1** | **7.1** | **0.8** | **3,927** |
| **Geographic areas of ZOI[abcde]** | | | | | | |
| Zanzibar | 11.4 | 60.1 | 43.0 | 15.6 | 1.5 | 2,116 |
| Mainland | 12.3 | 33.4 | 27.0 | 5.8 | 0.6 | 1,811 |
| In Depth Regions | 12.1 | 38.6 | 29.5 | 8.2 | 1.0 | 1,103 |
| **Pregnancy status[abd]** | | | | | | |
| Pregnant | 11.1 | 44.6 | 23.1 | 19.7 | 1.8 | 311 |
| Not pregnant | 12.3 | 36.2 | 29.6 | 6.0 | 0.7 | 3,616 |
| **Age** | | | | | | |
| 15-19 | 12.2 | 37.4 | 30.2 | 6.6 | 0.7 | 884 |
| 20-24 | 12.2 | 37.4 | 28.8 | 8.3 | 0.3 | 728 |
| 25-29 | 12.1 | 38.0 | 31.7 | 5.8 | 0.5 | 621 |
| 30-34 | 12.3 | 34.2 | 26.4 | 6.3 | 1.4 | 508 |
| 35-39 | 12.3 | 34.4 | 25.8 | 7.7 | 0.9 | 437 |
| 40-44 | 12.2 | 36.9 | 27.2 | 8.6 | 1.2 | 387 |
| 45-49 | 12.2 | 40.1 | 32.3 | 7.0 | 0.8 | 362 |
| **Educational attainment[abcd]** | | | | | | |
| No education | 12.0 | 46.4 | 36.8 | 8.6 | 1.0 | 530 |
| Less than primary | 12.0 | 37.3 | 25.3 | 10.3 | 1.7 | 423 |
| Primary | 12.3 | 34.5 | 27.8 | 6.0 | 0.7 | 2,252 |
| Secondary or more | 12.2 | 38.1 | 29.4 | 8.6 | 0.2 | 722 |
| **Gendered household type[2]** | | | | | | |
| Male and female adults | 12.2 | 37.7 | 29.5 | 7.5 | 0.7 | 3,421 |
| Female adult(s) only | 12.3 | 33.9 | 27.4 | 5.9 | 0.7 | 478 |
| Male adult(s) only | ^ | ^ | ^ | ^ | ^ | 28 |
| **Household size[abc]** | | | | | | |
| Small (1-5 members) | 12.3 | 34.1 | 26.6 | 6.7 | 0.8 | 1,770 |
| Medium (6-10 members) | 12.2 | 39.6 | 31.4 | 7.4 | 0.7 | 1,907 |
| Large (11+ members) | 11.9 | 47.8 | 38.1 | 9.2 | 0.6 | 250 |

^ 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] There are no children only households.

[a-c] A superscript in the column heading indicates significance tests were performed for associations between the indicator in the column heading and each of the variables in the rows. For example, a test was done between Hg and the woman's age. When an association between the column indicator and row variable is found to be significant ($p<0.05$), the superscript for the indicator in the column heading is noted next to the row variable.

Source: Tanzania DHS, 2015-16

### 7.3.2 Anemia in Children Under 5 Years

Hemoglobin levels were collected for all children age 6-59 months in the TDHS 2010. The hemoglobin level, adjusted for differences in altitude, was already in the publicly available dataset, as was a categorical variable indicating level of anemia. A variable indicating the presence of any anemia (mild, moderate or severe) was created. The prevalence of anemia was calculated and summarized in Table 7.3.2, disaggregated by geographic area, child gender and age, mother's educational attainment, gendered household type, and household size.

Among all children age 6-59 months in the Tanzania ZOI, mean Hemoglobin (Hg, g/dL) is 10.7, which is anemic. In the Tanzania ZOI, 55.5 percent of children are anemic. This includes 28.1 percent prevalence of mild anemia, 26.5 percent prevalence of moderate anemia, and 0.8 percent prevalence of severe anemia. These levels are nearly identical to the 2015-16 DHS national levels of 57.7 percent for any anemia, 26.5 percent for mild anemia, 29.6 percent for moderate anemia, and 1.6 percent for severe anemia among children 6-59 months.[94]

As shown in Table 7.3.2, children's age is significantly associated with hemoglobin levels and prevalence of anemia of any category. Hemoglobin levels improve and prevalence of any category of anemia decline with age. For example, the prevalence of any anemia is 81.5 percent for 6-11 month olds, and 38.4 percent for 48-59 month olds. Hemoglobin levels and prevalence of anemia are not significantly associated with child sex.

Hemoglobin levels and prevalence of anemia vary significantly by maternal educational attainment. Children with mothers who have no education tend to have the lowest hemoglobin levels and highest prevalence of any anemia (67.7 percent), moderate anemia (36.1 percent) and severe anemia (1.9 percent) when compared to children with mothers who have higher education.

Hemoglobin and prevalence of any anemia and moderate anemia are significantly associated with geographic region, with children in Zanzibar suffering lower levels of hemoglobin and higher prevalence of any anemia (64.7 percent) and moderate anemia (33.6 percent) when compared to children in mainland ZOI (54.2 percent and 25.5 percent, respectively). There is no significant association of hemoglobin or anemia with household size. The only significant association with gendered household type is that children from male and female adult households have higher prevalence of moderate anemia (27.5 percent) than children from female-adult(s) only households (18.8 percent).

[94] MoHCDGEC et. al. 2016.

*Table 7.3.2 Anemia among children under 5 years old*

| Characsteristic | Mean Hg (g/dl)[a] | Any anemia[b] (<11.0 g/dl) | Mildly anemic[c] (10 10.9 g/dl) | Moderately Anemic[d] (7.0 9.9 g/dl) | Severely Anemic[e] (<7.0 g/dl) | n[1] |
|---|---|---|---|---|---|---|
| **Total (All children under 5 years)** | **10.7** | **55.5** | **28.1** | **26.5** | **0.8** | **2,601** |
| **Geographic Areas of ZOI[abd]** | | | | | | |
| Zanzibar | 10.4 | 64.7 | 30.5 | 33.6 | 0.6 | 1,399 |
| Mainland | 10.8 | 54.2 | 27.8 | 25.5 | 0.9 | 1,202 |
| In Depth Regions | 10.7 | 55.6 | 27.1 | 27.3 | 1.2 | 769 |
| **Child gender** | | | | | | |
| Male | 10.7 | 56.2 | 26.9 | 28.8 | 0.5 | 1,277 |
| Female | 10.8 | 54.8 | 29.4 | 24.2 | 1.2 | 1,324 |
| **Child age[abcde]** | | | | | | |
| 6-11 months | 9.9 | 81.5 | 33.0 | 47.2 | 1.2 | 312 |
| 12-23 months | 10.3 | 71.3 | 32.1 | 37.3 | 1.9 | 625 |
| 24-35 months | 10.7 | 58.3 | 31.0 | 26.7 | 0.7 | 547 |
| 36-47 months | 11.2 | 38.2 | 22.9 | 15.3 | 0.0 | 520 |
| 48-59 months | 11.3 | 38.4 | 23.6 | 14.4 | 0.4 | 597 |
| **Mother's educational attainment[2abde]** | | | | | | |
| No education | 10.3 | 67.7 | 29.6 | 36.1 | 1.9 | 509 |
| Less than primary | 10.7 | 56.2 | 25.5 | 30.6 | 0.1 | 283 |
| Primary | 10.9 | 52.3 | 28.9 | 22.9 | 0.6 | 760 |
| Secondary or more | 10.7 | 57.0 | 26.2 | 29.6 | 1.2 | 786 |
| **Gendered household type [3d]** | | | | | | |
| Male and female adults | 10.7 | 55.6 | 27.2 | 27.5 | 0.8 | 2,343 |
| Female adult(s) only | 10.8 | 53.5 | 34.1 | 18.8 | 0.6 | 245 |
| Male adult(s) only | ^ | ^ | ^ | ^ | ^ | 13 |
| **Household size** | | | | | | |
| Small (1-5 members) | 10.8 | 55.1 | 26.8 | 27.8 | 0.5 | 1,055 |
| Medium (6-10 mmbers) | 10.7 | 55.6 | 29.0 | 25.4 | 1.3 | 1,382 |
| Large (11+ members) | 10.7 | 58.8 | 34.0 | 24.6 | 0.2 | 164 |

^ 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 Tanzania DHS includes mother's educational attainment alongside child's information. We will assume that in the great majority of cases the mother is the primary caregiver. Also, there are 263 children missing mother's education in this analysis

[3] There are no children under age 5 found in "children only" gendered household type.

[a-e] A superscript in the column heading indicates significance tests were performed for associations between the indicator in the column heading and each of the variables in the rows. For example, a test was done between the percent anemic and the child's sex. When an association between the column indicator and row variable is found to be significant ($p<0.05$), the superscript for the indicator in the column heading is noted next to the row variable.

Source: Tanzania DHS 2015-16

# 8. Summary and Conclusions

This report presents the results of the first interim assessment for Feed the Future Tanzania Zone of Influence (ZOI), and will provide the U.S. Government (USG) interagency partners, USAID Bureau for Food Security (BFS), USAID Missions, host country governments, and development partners with information about short-term progress of the ZOI indicators. The assessment is designed for use as a monitoring tool, and as such provides point estimates of the indicators with an acceptable level of statistical precision. However, Feed the Future ZOI sample calculations are not designed to support conclusions of causality or program attribution. Eleven Feed the Future indicators are included in this assessment: (1) Daily per capita expenditures (as a proxy for income) in USG-assisted areas; (2) Prevalence of Poverty; (3) Depth of Poverty; (4) Prevalence of households with moderate or severe hunger; (5) Women's Dietary Diversity; (6) Prevalence of children 6-23 months receiving a minimum acceptable diet (MAD); (7) Prevalence of exclusive breastfeeding among children under 6 months of age; (8) Prevalence of underweight women; (9) Prevalence of stunted children under 5 years of age; (10) Prevalence of wasted children under 5 years of age; and (11) Prevalence of underweight children under 5 years of age.

Data for the Feed the Future ZOI indicators presented in this assessment are drawn from two secondary sources and one primary source. The two secondary sources are the 2015-16 Tanzania Demographic and Health Survey (TDHS) and the 2014-15 Tanzania National Panel Survey (TzNPS). The TDHS, conducted from August 2015 until February 2016, contains data used to construct infant and young child feeding practice indicators as well as indicators that represent the nutritional status of women of reproductive age and children under age five. The TzNPS, conducted from October 2014 until November 2015, contains household consumption expenditure data which can be used to construct household economic status and poverty indicators. The primary data source is the Feed the Future Interim Supplemental Survey (FTFISS). This survey was conducted from May until July 2016 as a follow-up to the TzNPS in the ZOI by the Tanzania National Bureau of Statistics (NBS), in collaboration with the World Bank's Living Standards Measurement Study-Integrated Survey on Agriculture program. The same TzNPS households from the ZOI were re-visited in order to collect indicators not found in the secondary data sources: Women's Empowerment in Agriculture Index (WEAI), Women's Minimum Dietary Diversity (MDD-W), and Household Hunger Scale (HHS).

## Summary of Key Findings

### Household Economic Status

Average daily per capita expenditure in the Tanzania ZOI is $2.31 (2010 United States Dollars (USD)). The prevalence of poverty, defined as the percentage of individuals living below $1.25 2005 purchasing power parity (PPP) per day, is 36.7 percent. The depth of poverty (the mean shortfall for all individuals relative $1.25 2005 PPP per day poverty line) is 10.0 percent.

## Women's Empowerment in Agriculture Index Indicators

The Women's Empowerment in Agriculture Index (WEAI) sample reported above average rates of participation in decisionmaking over household income and ownership of assets. To account for the high rates of women's asset ownership and decisionmaking influence over income, two sets of WEAI results were calculated. The first set of results used the original adequacy thresholds set for the five WEAI domains. In the second set of WEAI results, the adequacy thresholds were adjusted for two indicators. Please refer to the WEAI section of this report for more details.

The overall WEAI Score for the Feed the Future ZOI was 0.92, but dropped to 0.88 after adjusting the adequacy thresholds. The adjusted 5DE index value is 0.87. Overall, approximately 57.6 percent of women have achieved adequate empowerment. Those who are not yet empowered (about 41 percent) have a mean 5DE score of 0.69 indicating that women not yet empowered had adequate achievements on average in about 69 percent of the domains.[95] The adjusted GPI is 0.97, and 73.7 percent of the women in the survey have achieved gender parity. The average empowerment gap between the 26.2 percent of women without gender parity and the adult males in their household is 0.12, which is relatively low.

## Hunger and Dietary Intake

Seventeen percent of households in the Tanzania ZOI have moderate to severe hunger. This may be an underestimate due to the timing of the interim survey, during the harvest season. Women's dietary diversity, or the mean number of food groups (out of nine possible) consumed by women of reproductive age in the Tanzania ZOI is 4.50.

The prevalence of exclusive breastfeeding among children under 6 months in the Tanzania ZOI is 60.4 percent. The prevalence of MAD among children 6-23 months in the ZOI at interim is very low at 7.2 percent.

## Nutritional Status of Women and Children

The prevalence of women's underweight (women of reproductive age with a Body Mass Index (BMI) below 18.5) in the Tanzania ZOI is 8.3 percent. Among children under 5 years in the ZOI, over one-third (35.2 percent) are stunted. Stunting is a height-for-age measurement that reflects chronic undernutrition. The prevalence of wasting is 5.3 percent and the prevalence of underweight is 13.5 percent. Wasting is a weight-for-height indicator of acute malnutrition, while underweight can indicate either acute or chronic malnutrition. The prevalence of anemia in

[95] A woman is defined as empowered in the 5DE if she reaches the threshold of empowerment [i.e., if she achieves adequacy] in 80 percent or more of the weighted 5DE indicators.

women of reproductive age in the Tanzania ZOI is 36.1 percent, while the prevalence of anemia in children aged 6-59 months in the ZOI is 55.5.

## Conclusions

While the intention of this report is to summarize interim indicator estimates, for many indicators the samples are sufficient to capture change over time. Note, however, the analysis has not been designed to support conclusions of causality or program attribution. It appears as though the prevalence and depth of poverty has gone down over time since the baseline for the ZOI as a whole as well as for each gendered household type and geographic area. However, none of these changes is significant at the 5 percent level. There has been a significant increase in daily per capita expenditure in the Tanzania ZOI, from $1.94 at baseline to $2.31 at interim (2010 USD), as well as a significant increase in this indicator for the male and female adult household disaggregate and the mainland ZOI household disaggregate.

There was a significant increase in Women's Dietary Diversity by over one-third from the baseline of 3.37 to 4.5 at interim. There was also a significant increase in the prevalence of exclusive breastfeeding from 44.6 percent at baseline to 60.4 percent at interim. Offsetting these seemingly positive developments in women's and children's diets, there was a significant decline in MAD for breastfed children from 15.3 percent at baseline to 8.0 percent at interim. Likewise, the components of MAD significantly declined for all children. The results over time in women's and children's diets should be interpreted with caution due to issues of seasonality and differences in the timing of data collection between baseline and interim.

Apart from anemia, most of the indicators of women's and children's nutritional status declined significantly from baseline to interim in the Tanzania ZOI. Prevalence of underweight women declined from 10.5 percent at baseline to 8.3 percent at interim. Prevalence of stunted children age 0-59 months declined from 48.3 percent at baseline to 35.2 percent at interim. Prevalence of underweight children declined from 18.7 percent to 13.5 percent between baseline and interim. While there was no significant difference in prevalence of child wasting from baseline to interim in the greater ZOI, there was a significant drop in the prevalence of wasting in Zanzibar, from 10.7 percent at baseline to 6.8 percent at interim. While there are no significant differences in women's or children's anemia across time, it seems that the prevalence of anemia has increased everywhere except for children on Zanzibar.

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# Appendix 1. Supplementary Data and Figures

## A1.1. Interim Feed the Future Indicator Estimates

*Unweighted sample sizes, point estimates, standard deviations, confidence intervals, design effects (DEFF), and nonresponse rates for the interim Feed the Future indicators for the Zone of Influence.*

| Feed the Future indicator | Estimate | | | | | | |
|---|---|---|---|---|---|---|---|
| | Indicator[a] | SD | 95% CI | | DEFF | Non response rate[1] | n |
| **Daily per capita expenditures (as a proxy for income) in USG-assisted areas (2010 USD)[a]** | | | | | | | |
| All households[5,a] | 2.31 | 2.02 | 2.03 | 2.59 | 22.55 | n/a[4] | 4525 |
| Male and female adults | 2.29 | 2.01 | 1.98 | 2.60 | 23.57 | n/a[4] | 3867 |
| Female adult(s) only | 2.21 | 2.00 | 1.88 | 2.53 | 3.90 | n/a[4] | 578 |
| Male adult(s) only | 3.68 | 1.85 | 3.10 | 4.26 | 2.00 | n/a[4] | 80 |
| **Prevalence of Poverty: Percent of people living on less than $1.25 per day (2005 PPP)[a]** | | | | | | | |
| All households[5] | 36.7 | 52.3 | 30.0 | 43.4 | 18.81 | n/a[4] | 4525 |
| Male and female adults | 35.3 | 52.9 | 28.4 | 42.1 | 16.32 | n/a[4] | 3867 |
| Female adult(s) only | 48.4 | 48.6 | 37.5 | 59.4 | 7.44 | n/a[4] | 578 |
| Male adult(s) only | 5.6 | 22.0 | -4.5 | 15.6 | 4.21 | n/a[4] | 80 |
| **Depth of Poverty: Mean percent shortfall relative to the $1.25 per day (2005 PPP) poverty line[a]** | | | | | | | |
| All households[5] | 10.0 | 18.6 | 7.8 | 12.2 | 16.07 | n/a[4] | 4525 |
| Male and female adults | 9.6 | 19.1 | 7.2 | 12.0 | 15.95 | n/a[4] | 3867 |
| Female adult(s) only | 13.2 | 17.0 | 9.6 | 16.9 | 6.80 | n/a[4] | 578 |
| Male adult(s) only | 1.7 | 7.1 | -1.3 | 4.8 | 3.75 | n/a[4] | 80 |
| **Percent of women achieving adequacy on Women's Empowerment in Agriculture Index Indicators [2]** | | | | | | | |
| Input in productive decisions | | | | | | | |
| Autonomy in production | n/a | n/a | n/a | n/a | n/a | n/a | |
| Ownership of assets | | | | | | | |
| Purchase, sale or transfer of assets | | | | | | | |
| Access to and decisions on credit | | | | | | | |
| Control over use of income | | | | | | | |
| Group member | | | | | | | |
| Speaking in public | | | | | | | |
| Workload | | | | | | | |
| Leisure | | | | | | | |

| Feed the Future indicator | Estimate | | | | | | |
|---|---|---|---|---|---|---|---|
| | Indicator[a] | SD | 95% CI | | DEFF | Non response rate[1] | n |
| **Prevalence of households with moderate or severe hunger[a]** | | | | | | | |
| All households[5] | 17.0 | 37.6 | 11.9 | 22.1 | 3.31 | 3.9 | 716 |
| Male and female adults | 14.2 | 35.7 | 8.8 | 19.6 | 3.20 | n/a[6] | 558 |
| Female adult(s) only | 25.9 | 40.6 | 15.3 | 36.5 | 2.46 | n/a[6] | 143 |
| Male adult(s) only | ^ | ^ | ^ | | ^ | ^ | 15 |
| **Women's Dietary Diversity: Mean number of food groups consumed by women of reproductive age** | | | | | | | |
| All women age 15-49 | 4.50 | 1.34 | 4.32 | 4.68 | 3.79 | 5.0 | 853 |
| **Prevalence of exclusive breastfeeding among children under 6 months of age** | | | | | | | |
| All children | **60.4** | **54.9** | **52.4** | **68.4** | **1.48** | **n/a[3]** | **273** |
| Male children | 66.3 | 52.2 | 55.1 | 77.5 | 1.54 | n/a[3] | 131 |
| Female children | 54.6 | 56.8 | 42.9 | 66.3 | 1.53 | n/a[3] | 142 |
| **Prevalence of children 6-23 months receiving a minimum acceptable diet** | | | | | | | |
| All children | **7.2** | **29.2** | **5.0** | **9.5** | **1.36** | n/a[3] | 891 |
| Male children | 7.7 | 28.8 | 4.2 | 11.2 | 1.64 | n/a[3] | 432 |
| Female children | 6.7 | 29.4 | 3.2 | 10.1 | 1.60 | n/a[3] | 459 |
| | | | | | | | |
| **Prevalence of underweight women** | | | | | | | |
| All non-pregnant women age 15-49 | 8.3 | 31.4 | 7.2 | 9.5 | 1.26 | n/a[3] | 3629 |
| **Prevalence of stunted children under 5 years of age[a]** | | | | | | | |
| All children | **35.2** | **54.2** | **32.2** | **38.3** | **2.28** | n/a[3] | 2851 |
| Male children | 39.5 | 54.1 | 34.8 | 44.2 | 2.70 | n/a[3] | 1397 |
| Female children | 30.7 | 53.7 | 26.9 | 34.5 | 1.89 | n/a[3] | 1454 |
| **Prevalence of wasted children under 5 years of age** | | | | | | | |
| All children | **5.3** | **25.5** | **4.1** | **6.5** | **1.65** | n/a[3] | 2851 |
| Male children | 5.9 | 26.0 | 4.2 | 7.5 | 1.41 | n/a[3] | 1397 |
| Female children | 4.7 | 24.7 | 3.2 | 6.3 | 1.47 | n/a[3] | 1454 |
| **Prevalence of underweight children under 5 years of age** | | | | | | | |
| All children | **13.5** | **38.8** | **11.5** | **15.5** | **1.94** | n/a[3] | 2851 |
| Male children | 14.3 | 38.8 | 11.7 | 16.9 | 1.58 | n/a[3] | 1397 |
| Female children | 12.6 | 38.7 | 10.2 | 15.1 | 1.49 | n/a[3] | 1454 |
| **Prevalence of anemia in women** | | | | | | | |
| All women age 15-49 | 36.9 | 54.8 | 34.5 | 39.3 | 1.95 | n/a[3] | 3,927 |
| **Prevalence of anemia in children under 5 years of age** | | | | | | | |
| All children | | | | | | n/a[3] | |
| Male children | | | | | | n/a[3] | |
| Female children | | | | | | n/a[3] | |

n/a – Not available.

^ Results not statistically reliable, n<30.

[1] Non-response rates for each indicator are derived by the difference between the number of eligible cases and the number of observations available for analysis divided by the number of eligible cases.

[2] The full WEAI score cannot be calculated because interim data were collected from women only and the autonomy indicator was dropped. The second interim survey (2017) will collect the full set of data from women and men and will report on the full WEAI.

[3] Not Available: In the case of secondary data from DHS, there is no access to this information for the Feed the Future ZOI. National-level response rates, as reported in the Tanzania DHS Final Report, are 98% for households, 97% for women of reproductive age, 98% of eligible children age 0-59 months, 92% of men of reproductive age.

[4] Not Available: In the case of secondary data from NPS, there is no access to this information for the Feed the Future ZOI. National-level household recapture rate, as reported in the National Panel Survey Wave 4 summary document, is 96% from round to round of this panel dataset.

[5] There are no Child only households in the ZOI.

[6] We do not know the gendered household type of most of the non-response households.

[a] Significance tests were run for associations between each indicator (bold text title in the rows) and the disaggregate variable below the indicator title. For example, a test was done between per capita expenditures and gendered household type. When an association between the indicator and disaggregate variable is found to be significant ($p<0.05$), the superscript is noted next to the indicator.

Source(s): Tanzania DHS 2015-16, Tanzania NPS 2014-2015,

## A1.2. *Poverty at the $1.90 (2011 PPP) per person per day threshold*

| Characteristic | Prevalence of Poverty[1,4] | | Depth of Poverty[2,4] | | Average consumption shortfall of the poor[3,4] | | |
|---|---|---|---|---|---|---|---|
| | Percent population[a] | n[5] | Percent of poverty line[b] | n[5] | In USD 2011 PPP[c] | Percent of poverty line[c] | n[5] |
| **Total (All households)** | **41.6** | **4525** | **12.3** | **4525** | **0.56** | **29.6** | **1587** |
| **Geographic area of ZOI[b,c]** | | | | | | | |
| Zanzibar | 34.3 | 2623 | 9.7 | 2623 | 0.54 | 28.2 | 803 |
| Mainland | 42.7 | 1902 | 12.7 | 1902 | 0.57 | 29.8 | 784 |
| In Depth Region | 49.2 | 1091 | 15.7 | 1091 | 0.61 | 31.9 | 505 |
| **Gendered household type[6,a,b]** | | | | | | | |
| Male and female adults | 40.5 | 3867 | 11.9 | 3867 | 0.56 | 29.3 | 1308 |
| Female adult(s) only | 52.6 | 578 | 16.2 | 578 | 0.58 | 30.8 | 270 |
| Male adult(s) only | 5.6 | 80 | 2.0 | 80 | ^ | ^ | 9 |
| **Household size[a,b,c]** | | | | | | | |
| Small (1-5 members) | 33.9 | 1924 | 8.5 | 1924 | 0.48 | 25.1 | 469 |
| Medium (6-10 members) | 47.4 | 2372 | 15.4 | 2372 | 0.62 | 32.6 | 978 |
| Large (11+ members) | 61.0 | 229 | 19.0 | 229 | 0.59 | 31.1 | 140 |
| **Household educational attainment[a,b,c]** | | | | | | | |
| No education | 51.5 | 138 | 13.4 | 138 | 0.49 | 26.0 | 70 |
| Less than primary | 68.3 | 537 | 21.6 | 537 | 0.60 | 31.7 | 334 |
| Primary | 38.7 | 3434 | 11.3 | 3434 | 0.56 | 29.2 | 1164 |
| Secondary or more | 1.1 | 416 | 0.2 | 416 | ^ | ^ | 19 |

^ Results not statistically reliable, n<30.

[1] The prevalence of poverty is the percentage of individuals living below the $1.90 (2011 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] A significance test was performed for associations between the indicator in the column heading and each of the variables in the rows. For example, a test was done between prevalence of poverty and gendered household type. When an association between the column indicator and row variable is found to be significant ($p<0.05$), the superscript for the indicator in the column heading is noted next to the row variable.

[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.

[6] There are no Children only households.

[a-c] Superscripts in the column heading indicates significance tests were performed for associations between the indicator in the column heading and each of the variables in the rows. For example, a test was done between prevalence of poverty and gendered household type. When an association between the column indicator and row variable is found to be significant ($p<0.05$), the superscript for the indicator in the column heading is noted next to the row variable

Source: Tanzania NPS, October 2014 – November 2015.

## A1.3. *Descriptive Tables for Additional Secondary Sources*

***Table A1.3.1 (to accompany Tables 3.1.1 and 3.1.2) Household demographic characteristics – TNPS 2014-15***

| Characteristic | Total (All households) | By gendered household type[a] | | | |
|---|---|---|---|---|---|
| | | Male and female adult | Female adult(s) only | Male adult(s) only | Child only |
| Mean household size[a] | 4.54 | 5.26 | 3.17 | 1.52 | |
| Mean number of adult female household members[1,2,a] | 1.15 | 1.26 | 1.17 | 0.0 | ^ |
| Mean number of children (<2 years)[1,a] | 0.29 | 0.36 | 0.15 | 0.04 | ^ |
| Mean number of children (0-4 years)[1,a] | 0.72 | 0.83 | 0.58 | 0.04 | ^ |
| Mean number of children (5-17 years)[1,a] | 1.64 | 1.83 | 1.42 | 0.39 | ^ |
| Mean percentage of adults who are female[1,2,a] | 57.4 | 49.2 | 100.0 | 0.0 | ^ |
| **Highest education level attained** | | | | | |
| No education (%)[a] | 8.4 | 5.4 | 16.4 | 12.8 | ^ |
| Less than primary (%)[a] | 14.4 | 9.8 | 24.9 | 26.8 | ^ |
| Primary (%)[a] | 72.5 | 79.3 | 55.7 | 57.1 | ^ |
| Secondary or more (%) | 4.8 | 5.5 | 3.0 | 3.2 | ^ |
| **n[3]** | **928** | **702** | **178** | **48** | **0** |

^ Results not statistically reliable, n<30.

[1] The count 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.

[a] Significance tests were performed for associations between household characteristics and gendered household type. For example, a test was done between mean household size and gendered household type. When an association is found to be significant (p<0.05), a superscript is noted next to the household characteristic.

Source: Tanzania NPS October 2014-November 2015

### *Table A1.3.2 (to accompany Table 3.1.1 and 3.1.2) Household dwelling characteristics – TNPS 2014-15*

| | Total (All households) | |
|---|---|---|
| **Characteristic** | **Estimate** | **n** |
| Percent with improved water source, rainy[1] | 64.5 | 928 |
| Percent with improved water source, dry[1] | 61.0 | 928 |
| Percent with improved sanitation[2] | 30.2 | 928 |
| Percent using solid fuel for cooking[3] | 96.4 | 928 |
| Percent with access to electricity | 20.0 | 928 |
| **Household roof materials (%)[4]** | | |
| Natural/Rudimentary | 25.2 | 928 |
| Finished | 74.8 | 928 |
| **Household exterior wall materials (%)[5]** | | |
| Natural/Rudimentary | 52.7 | 928 |
| Finished | 45.9 | 928 |
| **Household floor materials (%)[6]** | | |
| Natural | 57.0 | 928 |
| Rudimentary/Finished | 42.8 | 928 |

[1] Improved water sources include *piped water into the dwelling, piped water into the yard, a public tap/standpipe, a tube well/borehole, a protected dug well, a protected spring,* and *rainwater* (WHO and UNICEF 2006). The proportion of the population with sustainable access to an improved water source is the 2015 MDG indicator #30 (UNDP 2003); however, as in most major international survey programs, the measure reported here reflects only access to an improved water source, and not the sustainability of that access. The TNPS measures this indicator for both rainy and dry seasons separately.

[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 a *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 2015 MDG indicator #31 (UNDP 2003).

[3] Solid fuel is defined as *charcoal, wood, animal dung,* and *agriculture crop residue.* The proportion of the population using solid fuels is MDG indicator #29 (UNDP 2003). The *other* and *no food cooked in household* categories are removed from percentages.

[4] Natural roofs include *no roof, thatch/palm leaf,* and *sod.* Rudimentary roof includes *rustic mat, palm/bamboo, 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. The categories of roof used by the TNPS necessitate combining natural with rudimentary type roofs.

[5] Natural walls include *no walls, cane/palm/trunks,* and *dirt.* Rudimentary walls include *bamboo with mud, stone with mud, uncovered adobe, plywood, cardboard, reused wood,* and *metal sheeting.* Finished walls include *cement, stone with lime/cement, bricks, cement blocks, covered adobe,* and *wood planks/shingles.* The *other* category is removed from percentages. The categories of wall used by the TNPS necessitate combining natural with rudimentary type walls.

[6] Natural floors include *earth/sand* and *dung.* Rudimentary floors include *wood planks* and *palm/bamboo.* Finished floors include *parquet/polished wood, vinyl or asphalt strips, ceramic tiles, cement* and *carpet.* The *other* category is removed from percentages. The categories of floor used by the TNPS necessitate combining rudimentary with finished.

Source: Tanzania NPS October 2014-November 2015

*Table A1.3.3 (to accompany Table 3.3.1) School attendance, educational attainment, and literacy – TNPS 2014-15*

| Characteristic | Percent | | | Female to Male Ratio | | | |
|---|---|---|---|---|---|---|---|
| | Attending school[1,a] | Attained a primary level of education[2,b] | Literate[3,c] | Attending school[1] | Attained a primary level of education[2] | Literate[3] | n[4] |
| **ALL** | **55.3** | **51.4** | **69.3** | **0.98** | **0.99** | **0.96** | **3,811** |
| **Age group[a, b,c]** | | | | | | | |
| **5-9** | 62.7 | n/a[1] | 41.3 | **1.18** | n/a[1] | **1.18** | **659** |
| **10-14** | 78.0 | 8.1 | 79.0 | **1.03** | **1.83** | **1.09** | **633** |
| **15-19** | 41.9 | 68.8 | 84.5 | **1.17** | **1.11** | **1.04** | **459** |
| **20-24** | 10.9 | 74.2 | 81.6 | **0.73** | **1.03** | **0.98** | **375** |
| **25-29** | n/a[2] | 66.8 | 71.8 | n/a[2] | **1.11** | **1.06** | **291** |
| **30-34** | n/a[2] | 69.9 | 80.6 | n/a[2] | **0.91** | **0.97** | **302** |
| **35-54** | n/a[2] | 65.1 | 71.6 | n/a[2] | **0.81** | **0.80** | **767** |
| **55+** | n/a[2] | 27.8 | 46.0 | n/a[2] | **0.40** | **0.41** | **325** |
| **Sex** | | | | | | | |
| **Female** | **56.3** | **51.0** | **68.1** | **n/a[3]** | **n/a[3]** | **n/a[3]** | **1,964** |
| **Age group[a,b,c]** | | | | | | | |
| 5-9 | 68.6 | n/a[1] | 45.1 | n/a[3] | n/a[3] | n/a[3] | 325 |
| 10-14 | 79.2 | 10.6 | 82.6 | n/a[3] | n/a[3] | n/a[3] | 306 |
| 15-19 | 45.6 | 72.8 | 86.4 | n/a[3] | n/a[3] | n/a[3] | 218 |
| 20-24 | 9.5 | 75.1 | 80.9 | n/a[3] | n/a[3] | n/a[3] | 210 |
| 25-29 | n/a[2] | 70.2 | 73.9 | n/a[3] | n/a[3] | n/a[3] | 159 |
| 30-34 | n/a[2] | 67.4 | 79.8 | n/a[3] | n/a[3] | n/a[3] | 175 |
| 35-54 | n/a[2] | 58.5 | 64.0 | n/a[3] | n/a[3] | n/a[3] | 409 |
| 55+ | n/a[2] | 15.5 | 26.1 | n/a[3] | n/a[3] | n/a[3] | 162 |
| | | | | | | | |
| **Male** | **54.4** | **51.7** | **70.6** | **n/a[3]** | **n/a[3]** | **n/a[3]** | **1,847** |
| **Age group[a,b,c]** | | | | | | | |
| 5-9 | 57.9 | n/a[1] | 38.2 | n/a[3] | n/a[3] | n/a[3] | 334 |
| 10-14 | 76.8 | 5.8 | 75.7 | n/a[3] | n/a[3] | n/a[3] | 327 |
| 15-19 | 39.1 | 65.7 | 83.0 | n/a[3] | n/a[3] | n/a[3] | 241 |
| 20-24 | 13.1 | 72.7 | 82.6 | n/a[3] | n/a[3] | n/a[3] | 165 |
| 25-29 | n/a[2] | 63.4 | 69.6 | n/a[3] | n/a[3] | n/a[3] | 132 |
| 30-34 | n/a[2] | 74.2 | 82.0 | n/a[3] | n/a[3] | n/a[3] | 127 |
| 35-54 | n/a[2] | 72.2 | 79.9 | n/a[3] | n/a[3] | n/a[3] | 358 |
| 55+ | n/a[2] | 39.1 | 64.3 | n/a[3] | n/a[3] | n/a[3] | 163 |

n/a[1] Not applicable – Children in the age group 5-9 years are not yet old enough to have attained a primary level of education.
n/a[2] Not applicable – Current school attendance applies to school-age children and youth only, ages 5-24.
n/a[3] Not applicable – Female to male ratios cannot be calculated for male-only and female-only disaggregates.
[1] The academic year in Tanzania starts in January and ends in November. The TNPS data was collected October 2014 – November 2015.
[2] The goals of achieving universal primary education and achieving gender equity with respect to education are assessed by multiple MDG indicators, typically using administrative school data. This table presents respondent-reported school attendance, primary educational attainment, and literacy, as well as the ratio of females to males on these measures (UNDP 2003).
[3] The MDG indicators for universal primary education and gender equity within education are assessed through the literacy rate (MDG indicator #8) and the ratio of literate women to men (MDG indicator #10) among young adults, age 15-24 years (UNDP 2003).
[a-c] Significance tests were performed for associations between the indicator in the column heading, and age and sex. For example, a test was done for school attendance by sex, and a test was done for school attendance by age. When an association is found to be significant ($p<0.05$), the superscript of the column heading will appear next to the sex row heading and/or next to the age group row heading.
Source: Tanzania NPS, October 2014-November 2015

## A1.4. *Indicator Tables for Additional Secondary Sources*

***Table A1.4.1 (to accompany Table 7.1) Prevalence of underweight, normal weight, overweight, and obese women***

| Characteristic | Mean BMI[a] | Body Mass Index (BMI) category (percent)[b] Under weight[b] | Normal weight[c] | Over weight[d] | Obese[e] | n[1] |
|---|---|---|---|---|---|---|
| **Total (All women age 15-49)** | **24.1** | **8.6** | **60.3** | **18.8** | **12.4** | **822** |
| **Geographic areas of ZOI[c,d]** | | | | | | |
| Zanzibar | 24.5 | 10.0 | 52.8 | 23.4 | 13.8 | 455 |
| Mainland | 24.1 | 8.4 | 61.2 | 18.2 | 12.2 | 367 |
| In Depth Regions | 23.7 | 10.7 | 63.4 | 14.8 | 11.0 | 221 |
| **Age[a,b,c,d,e]** | | | | | | |
| 15-19 | 21.0 | 21.7 | 68.9 | 5.3 | 4.1 | 146 |
| 20-24 | 23.9 | 0.9 | 74.9 | 16.1 | 8.2 | 145 |
| 25-29 | 25.4 | 6.2 | 52.2 | 25.6 | 16.1 | 126 |
| 30-34 | 25.4 | 5.2 | 57.4 | 20.0 | 17.4 | 155 |
| 35-39 | 25.1 | 7.6 | 49.9 | 27.4 | 15.1 | 100 |
| 40-44 | 23.8 | 8.3 | 61.2 | 18.4 | 12.1 | 95 |
| 45-49 | 24.9 | 10.9 | 47.6 | 25.2 | 16.3 | 55 |
| **Educational attainment[a,c,e]** | | | | | | |
| No education | 23.4 | 5.8 | 69.2 | 17.8 | 7.2 | 122 |
| Less than primary | 22.5 | 13.1 | 66.3 | 13.6 | 7.0 | 85 |
| Primary | 24.6 | 8.8 | 56.5 | 20.1 | 14.7 | 589 |
| Secondary or more | ^ | ^ | ^ | ^ | ^ | 26 |
| **Gendered household type[2]** | | | | | | |
| Male and female adults | 24.2 | 7.9 | 61.4 | 18.2 | 12.5 | 673 |
| Female adult(s) only | 23.8 | 11.2 | 55.0 | 21.4 | 12.4 | 146 |
| Male adult(s) only | ^ | ^ | ^ | ^ | ^ | 3 |
| **Household size** | | | | | | |
| Small (1-5 members) | 24.7 | 7.6 | 56.4 | 21.1 | 14.8 | 420 |
| Medium (6-10 members) | 23.3 | 10.2 | 64.7 | 15.6 | 9.5 | 380 |
| Large (11+ members) | ^ | ^ | ^ | ^ | ^ | 22 |

^ 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] There are no children only households.

[a-e] A superscript in the column heading indicates significance tests were performed for associations between the indicator in the column heading and each of the variables in the rows. For example, a test was done between BMI and the woman's age. When an association between the column indicator and row variable is found to be significant ($p<0.05$), the superscript for the indicator in the column heading is noted next to the row variable.

Source: Tanzania NPS, 2014-2015

*Table A1.4.2 (to accompany Table 7.2.1) Stunting (height-for-age) among children under 5 years old*

| Characteristic | % Stunted (< 2 SD)[a] | % Severely stunted (< 3 SD)[b] | Mean Z score [c] | n[1] |
|---|---|---|---|---|
| **Total (All children under 5 years)** | **41.1** | **18.4** | **-1.51** | **553** |
| **Geographic areas of ZOI[c]** | | | | |
| Zanzibar | 35.3 | 12.6 | -1.27 | 280 |
| Mainland | 41.8 | 19.1 | -1.54 | 273 |
| In Depth Regions | 37.4 | 16.3 | -1.35 | 169 |
| **Child sex[c]** | | | | |
| Male | 43.7 | 22.0 | -1.70 | 306 |
| Female | 38.0 | 14.2 | -1.30 | 247 |
| **Child age[a,c]** | | | | |
| 0-11 months | 25.0 | 14.1 | -0.44 | 96 |
| 12-23 months | 47.4 | 22.4 | -1.92 | 124 |
| 24-35 months | 44.1 | 19.8 | -1.73 | 113 |
| 36-47 months | 41.6 | 17.1 | -1.54 | 113 |
| 48-59 months | 44.8 | 17.5 | -1.75 | 107 |
| **Gendered household type[2]** | | | | |
| Male and female adults | 42.1 | 16.2 | -1.54 | 474 |
| Female adult(s) only | 37.8 | 28.5 | -1.47 | 77 |
| Male adult(s) only | ^ | ^ | ^ | 2 |
| **Household size[a]** | | | | |
| Small (1-5 members) | 31.2 | 16.3 | -1.33 | 242 |
| Medium (6-10 members) | 48.1 | 21.1 | -1.64 | 288 |
| Large (11+ members) | ^ | ^ | ^ | 23 |

^ 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] There are no children under age 5 found in "children only" gendered household type.

[a-c] A superscript in the column heading indicates significance tests were performed for associations between the indicator in the column heading and each of the variables in the rows. For example, a test was done between percent stunted and the child's sex. When an association between the column indicator and row variable is found to be significant (p<0.05), the superscript for the indicator in the column heading is noted next to the row variable.

Source: Tanzania NPS 2014-15

*Table A1.4.3 (to accompany Table7.2.2) Wasting (weight-for-height) among children under 5 years old*

| Characteristic | % Wasted (< 2 SD) [a] | % Severely wasted (< 3 SD)[b] | % Overweight (> +2SD) [c] | % Obese (> +3SD)[d] | Mean Z score [e] | n[1] |
|---|---|---|---|---|---|---|
| **Total (All children under 5 years)** | **5.0** | **1.7** | **6.4** | **2.4** | **0.05** | **553** |
| **Geographic Areas of ZOI[c]** | | | | | | |
| Zanzibar | 3.2 | 0.1 | 3.1 | 1.5 | -0.10 | 280 |
| Mainland | 5.3 | 1.8 | 6.8 | 2.5 | 0.07 | 273 |
| In Depth Regions | 5.0 | 1.3 | 4.3 | 2.5 | -0.04 | 169 |
| **Child sex[e]** | | | | | | |
| Male | 4.4 | 0.4 | 5.5 | 1.9 | 0.12 | 306 |
| Female | 5.8 | 3.2 | 7.5 | 3.0 | -0.03 | 247 |
| **Child age[a,c,d,e]** | | | | | | |
| 0-11 months | 9.0 | 4.6 | 24.3 | 11.7 | 0.54 | 96 |
| 12-23 months | 9.9 | 2.1 | 2.8 | 0.1 | -0.02 | 124 |
| 24-35 months | 4.7 | 1.6 | 3.5 | 0.1 | 0.05 | 113 |
| 36-47 months | 0.1 | 0.0 | 2.1 | 0.0 | -0.04 | 113 |
| 48-59 months | 0.8 | 0.0 | 1.4 | 1.4 | -0.23 | 107 |
| **Gendered household type [2,a]** | | | | | | |
| Male and female adults | 5.8 | 2.0 | 7.2 | 3.0 | 0.13 | 474 |
| Female adult(s) only | 2.0 | 0.0 | 3.1 | 0.1 | -0.31 | 77 |
| Male adult(s) only | ^ | ^ | ^ | ^ | ^ | 2 |
| **Household size[a,d,e]** | | | | | | |
| Small (1-5 members) | 3.0 | 1.9 | 6.4 | 1.1 | 0.11 | 242 |
| Medium (6-10 mmbers) | 7.3 | 1.6 | 6.1 | 3.0 | -0.04 | 288 |
| Large (11+ members) | ^ | ^ | ^ | ^ | ^ | 23 |

^ 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] There are no children under age 5 found in "children only" gendered household type.

[a-e] A superscript in the column heading indicates significance tests were performed for associations between the indicator in the column heading and each of the variables in the rows. For example, a test was done between the percent wasted and the child's sex. When an association between the column indicator and row variable is found to be significant (p<0.05), the superscript for the indicator in the column heading is noted next to the row variable.

Source: Tanzania NPS 2014-2015

*Table A1.4.4 (to accompany Table 7.2.3) Underweight (weight-for-age) among children under 5 years old*

| Characteristic | % Underweight (< 2 SD)[a] | % Severely underweight (< 3 SD)[b] | Mean Z score [c] | n[1] |
|---|---|---|---|---|
| **Total ZOI (All children under 5 years)** | **18.7** | **5.4** | **-0.82** | **553** |
| **Geographic areas of ZOI[b]** | | | | |
| Zanzibar | 14.2 | 1.8 | -0.79 | 280 |
| Mainland | 19.2 | 5.9 | -0.82 | 273 |
| In Depth Regions | 16.2 | 6.4 | -0.78 | 169 |
| **Child sex[c]** | | | | |
| Male | 20.0 | 5.4 | -0.84 | 306 |
| Female | 17.1 | 5.4 | -0.78 | 247 |
| **Child age[a,c]** | | | | |
| 0-11 months | 8.2 | 3.5 | 0.05 | 96 |
| 12-23 months | 28.5 | 8.0 | -0.95 | 124 |
| 24-35 months | 16.4 | 6.0 | -0.90 | 113 |
| 36-47 months | 19.2 | 5.4 | -0.94 | 113 |
| 48-59 months | 19.2 | 3.7 | -1.23 | 107 |
| **Gendered household type[2]** | | | | |
| Male and female adults | 17.2 | 4.3 | -0.78 | 474 |
| Female adult(s) only | 25.7 | 10.6 | -1.03 | 77 |
| Male adult(s) only | ^ | ^ | ^ | 2 |
| **Household size[a]** | | | | |
| Small (1-5 members) | 10.7 | 6.8 | -0.67 | 242 |
| Medium (6-10 members) | 25.9 | 4.6 | -0.96 | 288 |
| Large (11+ members) | ^ | ^ | ^ | 23 |

^ 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] There are no children under age 5 found in "children only" gendered household type.

[a-c] A superscript in the column heading indicates significance tests were performed for associations between the indicator in the column heading and each of the variables in the rows. For example, a test was done between the percent underweight and the child's sex. When an association between the column indicator and row variable is found to be significant (p<0.05), the superscript for the indicator in the column heading is noted next to the row variable.

Source: Tanzania NPS 2014-15

# Appendix 2. Methodology

## A2.1 Sampling and Weighting

### *Sampling*

The sample of households for the Feed the Future Interim Supplemental Survey (FTFISS) included 2014-15 National Panel Survey (NPS) households found in the Tanzania Feed the Future Zone of Influence (ZOI), comprised of the following regions: Dodoma, Manyara, Morogoro, Mbeya, Iringa, and all three areas of Unguja in Zanzibar. In cases where the household had no female members, the household was not considered eligible for the FTFISS and was not interviewed to completion. The resulting sample size of eligible households for the first FTFISS was 727 households from 100 clusters. A summary of the sampling framework for the NPS from which the FTFISS is derived follows below.

The National Panel Survey is a nationally representative household survey. The term "panel" means that the survey follows the originally sampled population over time. The first round was in 2008-2009, the second round in 2010-2011, the third round in 2012-2013, and the fourth round from 2014-2015. The original NPS sample followed a stratified multi-stage cluster sample design. The original sampling frame was from the 2002 Population and Housing Census (PHC), which listed all of the enumeration areas in the country.[96] In the first stage, clusters or enumeration areas (EAs) were selected from 2002 PHC by probability proportional to size (PPS) sampling. The sampling of these clusters was stratified along two dimensions: (i.) eight administrative zones and (ii) rural versus urban within each administrative zone.[97] In the second stage, 8 households were selected for interview at random from each cluster. Altogether, the original sample comprised 410 clusters and 3,280 households nationally.[98]

NPS rounds 2 and 3 followed the same sample design from the first round. The number of households kept increasing due to follow up of split households. Additionally, the sample faced increasing risk of bias due to attrition. In the fourth round, the panel design was revisited and the sample refreshed. This is typically done to minimize attrition bias, ensure representativeness and maintain sufficient sample size. It also helps realign the sample with any changes in administrative boundaries and/or demographic changes.[99]

The 2014-15 NPS kept a nationally representative core of households from the original 2008/9 sample, calling this the extended sample, consisting of 860 households in 68 clusters. A new

[96] NBS 2017.
[97] NBS 2011b.
[98] NBS 2017.
[99] NBS 2017.

sample, called the refresh sample, was added and included 3,360 households from 420 clusters identified in the new 2012 PHC.[100]

### *Weighting*

In order to produce nationally representative statistics with the NPS data, it is necessary to apply weighting or expansion factors. The panel survey weights adjust for differences in the probability of selection into the NPS round 1 sample for observations in various strata. The weights also account for original households splitting into multiple households in later rounds, as well as attrition between rounds.[101]

## A2.2 Poverty Prevalence and Expenditure Methods

### *Data Source*

The *Household Roster* and *Household Consumption Expenditure* modules of the 2014-15 Tanzania National Panel Survey (NPS) are used to calculate the per capita expenditures and prevalence of poverty indicators. The TNPS is part of the Living Standards Measurement Study – Integrated Surveys on Agriculture (LSMS-ISA). The household consumption expenditure module measures households' consumption of various food and non-food items to infer household income and well-being. Individuals' per capita expenditures are then derived by dividing total household expenditures by the number of household members. From these data, household expenditure totals are calculated and used as a proxy for household incomes, based on the assumption that a household's consumption is closely related to its income.

### *Data Preparation*

Please refer to Appendix A: Methodology for Consumption Aggregates found in the Tanzania National Panel Survey Report – Wave 4, for all details regarding data preparation, imputations, prices, and other adjustments made in the construction of the consumption aggregate. The citation is as follows, and the document is available on the World Bank website:

National Bureau of Statistics (NBS) [Tanzania]. 2017. Tanzania National Panel Survey Report (NPS) – Wave 4, 2014 – 2015. Dar es Salaam, Tanzania. NBS.

### *Currency Conversions using CPI and PPP*

The following steps were taken in order to convert the consumption aggregate variable into a measure of daily per capita expenditures in 2010 USD:

[100] NBS 2017.
[101] NBS 2011b.

1. Divide total annual household expenditures (2014-2015 Tz shilling) by 365 days/year and then by household size to produce daily per capita expenditure (2014-2015 Tz shilling);
2. Convert daily per capita expenditures in 2014-2015 Tz shillings to 2005 Tz Shillings, by dividing by Consumer Price Index (base month-year September 2010) for survey month and year, and multiplying by the annual 2005 CPI base 2010. The monthly Tanzania CPI for 2014 and 2015 was downloaded from the National Bureau of Statistics Website, and the 2005 CPI with base year 2010 was extracted from World Development Indicators, World Bank;[102]
3. Convert daily per capita expenditures in 2005 Tz Shillings to 2005 PPP by dividing by the 2005 PPP conversion rate of 482.4509369;[103]
4. Convert daily per capita expenditures in 2005 PPP to 2010 USD by multiplying by the US CPI for 2010 of 111.65/100.[104]

### *Poverty Thresholds*

In addition to reporting the prevalence of poverty relative to the international extreme threshold of $1.25 per capita per day in 2005 PPP, the prevalence of poverty relative to the international threshold of $1.90 per capita per day in 2011 PPP is also reported in Appendix A1.2

### *Weights*

The Tanzania National Panel Survey weights from wave 4 were applied to the consumption expenditure and poverty data.

[102] https://data.worldbank.org/products/wdi.
[103] 482.4509369 as found on World Bank's PovCalNet.
[104] USAID. 2013. Feed the Future Indicator Handbook: Definition Sheets.

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

*The below table presents the Women's Empowerment in Agriculture five dimensions of empowerment, their corresponding empowerment indicators, the survey questions that are used to elicit the data required to establish adequacy or inadequacy for each empowerment indicator, and how adequacy criteria are defined for each empowerment indicator.*

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

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

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