FEED THE FUTURE

MONITORING AND EVALUATION GUIDANCE

Guidance for the

Implementation of

Zone of Influence Surveys

for Feed the Future

Target Countries

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# Abbreviations

5DE five domains of empowerment

A-WEAI Abbreviated Women’s Empowerment in Agriculture Index

AARC average annual rate of change

BFS Bureau for Food Security

DHS Demographic and Health Survey

EA enumeration area

FFP Office of Food for Peace

FIES Food Insecurity Experience Scale

GFSS Global Food Security Strategy

GPI Gender Parity Index

HHS Household Hunger Scale

LSMS-ISA Living Standards Measurement Study - Integrated Surveys on Agriculture

MDD-W Minimum Dietary Diversity - Women

MEL Monitoring, Evaluation and Learning

NSO national statistics office

PBS population-based survey

PPP purchasing power parity

PPS probability proportional to size

RAA required as applicable

SDG Sustainable Development Goal

SOW statement of work

TA technical advisor

USAID United States Agency for International Development

USG United States Government

WDDS Women’s Dietary Diversity Score

WEAI Women’s Empowerment in Agriculture Index

ZOI Zone of Influence

# 

# 1. Introduction

This document provides policy guidance and technical direction for planning and conducting the **baseline** population-based surveys (PBS) in the phase two Zones of Influence (ZOI) (hereafter, P2‑ZOI) in the 12 countries selected as target countries under the second phase of Feed the Future under the Global Food Security Strategy (GFSS). It also provides guidance on conducting the **endline** PBS in the Feed the Future phase one ZOI (hereafter, P1-ZOI) in the 10 countries that are former focus countries and are continuing as target countries under Feed the Future phase two.

The purpose of the Feed the Future P2-ZOI **baseline** survey is to establish current conditions in the P2-ZOI as the second phase of Feed the Future begins and provide a basis against which to set and measure progress toward five-year targets. The purpose of the P1-ZOI **endline** survey is to determine whether statistically significant positive change has been seen in the P1‑ZOI since baselines were established between 2010 and 2013 and whether population‑based indicator targets were met.

The primary audiences for this document are United States Agency for International Development (USAID) Missions and in-country interagency partners, USAID Washington and interagency partners, the World Bank’s Living Standards Measurement Study – Integrated Surveys on Agriculture (LSMS-ISA) team and other data collection organizations, and other stakeholders.

The policy and technical guidance provided in this document should be used in conjunction with the [Feed the Future ZOI Survey Methods Toolkit](https://agrilinks.org/post/feed-future-zoi-survey-methods)[[1]](#footnote-1), which provides mandatory technical guides, templates, and tools to standardize data collection processes and ensure data quality. These materials, combined with the close engagement of and technical advice from the Bureau for Food Security (BFS) Monitoring, Evaluation, and Learning (MEL) team, and the collaboration of the World Bank LSMS-ISA+ implementation team, where applicable, are designed to support the guiding principles for implementing Feed the Future ZOI Surveys:

* Collection, analysis, and reporting of accurate, complete, and high-quality data for decision-making
* Standardization of technical approaches
* Appropriate and consistent timing of survey implementation
* Evaluation-focused sampling approach

# 2. ZOI Survey Data Collection Requirements

Feed the Future phase two target countries[[2]](#footnote-2) are required to identify a P2-ZOI, a focused geographic area where the U.S. Government (USG) investments are intended to contribute to measurable and sustainable improvements in food security and nutrition. Feed the Future phase two target countries are required to collect representative PBS data in the P2-ZOI to establish baseline values for a set of required and required-as-applicable ZOI-level indicators during 2018 and 2019. Five-year targets for these ZOI-level indicators will be set after baseline values are collected in the baseline survey, and changes in indicator values will be measured and compared against these targets in subsequent surveys. The decision on whether the subsequent surveys will be conducted every three or every five to six years is forthcoming.

Feed the Future phase one focus countries that are continuing as phase two target countries are expected to collect endline PBS data in their P1-ZOIs. Most of these countries will opt to collect P2-ZOI baseline data and P1-ZOI endline data using a single survey vehicle. **In these countries, technical, timing, and other logistical decisions should be driven by what is optimal for the P2-ZOI baseline survey.** BFS recognizes and accepts that this may result in decreased comparability between baseline and endline for some P1-ZOI indicators in some countries. In addition, in instances where large changes in the geographies of the P1-ZOI and the P2-ZOI have potentially important cost implications, BFS may provide exemptions from collecting P1-ZOI indicators.

In an ongoing effort to continually improve the quality, reliability, and use of Feed the Future survey data, this guidance and the accompanying Toolkit address lessons learned and weaknesses identified in previous rounds of Feed the Future ZOI survey data collection. All Post teams overseeing a Feed the Future ZOI Survey, and survey implementers collecting these data, are required to adhere to the policy and technical requirements contained in this guidance. Post teams and survey implementers are also required to use the tools and templates contained in the [Feed the Future ZOI Survey Methods Toolkit](https://agrilinks.org/post/feed-future-zoi-survey-methods)[[3]](#footnote-3), as applicable. The Toolkit will help Post teams to streamline the process of ZOI survey design, data collection, and analysis; save time and money; and support the collection of high-quality data. Post teams that want to deviate from the policy and technical direction contained in this guidance or the guides, templates, and tools contained in the Toolkit should first consult with their BFS MEL Technical Advisor (MEL TA).

# 3. Sources of ZOI Survey Data

Collecting data on all GFSS ZOI-level indicators and other household- and individual-level variables from the same households in the same survey greatly increases the utility of the data. This is because the dataset will include a number of additional household- and individual-level variables beyond those needed to simply estimate the value of the indicators. The data can be used to help understand the determinants of hunger, malnutrition, and poverty within the ZOI, and to test the plausibility of Feed the Future contributions toward changes in the indicators. **BFS strongly encourages Post teams to collect all indicators in one survey.**

Using a mix of data sources (primary and secondary) to estimate indicator values will make it more difficult to interpret the relationship among indicators at a given point in time and to monitor and interpret changes over time. This is because using secondary data sources or a mix of primary and secondary data sources usually results in values for different indicators being collected in different years or in different times of the year, depending on the data source. In addition, data from the same secondary data source are unlikely to be available again at the required five- or six-year time interval, which will result in the Post team using a mix of data sources for the same indicator, further complicating the ability to track and understand change over time. Post teams considering use of secondary data should consult with their BFS MEL TA.

# 4. ZOI Survey Data Collection Approaches

This section describes the two main approaches to collect primary ZOI survey data: strengthening national data systems and conducting contractor-implemented household surveys. Post teams should discuss with their MEL TA the strengths, opportunities, and limitations of the range of options to collect ZOI survey data. This includes developing a P1-ZOI endline (if applicable) and P2-ZOI baseline data collection plan; ideally a back-up data collection plan should also be identified.

## 4.1 Strengthening National Data Systems

Under the first phase of Feed the Future, USAID obtained estimates for the Feed the Future ZOI-level indicators from secondary datasets, contractor-implemented household surveys, or a mix of both. Although this satisfied USG data needs, the contractor-implemented surveys were expensive, labor-intensive, and of variable quality. These surveys provided data for Feed the Future ZOIs only and did not help our partner countries collect and report on the Sustainable Development Goals (SDGs). Furthermore, using a mix of primary and secondary data sources introduced the analytical and interpretation complications described in Section 3.

Under Feed the Future phase two, Post teams should try to fulfill the requirement for collecting PBS data in the ZOI while also supporting partner governments’ national data needs and the capacity of national data systems. For example, under the BFS Core Agricultural and Rural Data Surveys project and an expansion of an existing BFS public international organization grant with the World Bank’s LSMS-ISA, or through bilateral agreements, Posts can support their partner country’s national statistics office (NSO) to implement a nationally representative, multi-topic survey with a sufficient sample in the ZOI for Feed the Future indicators.

In addition to the important development objective of strengthening national data systems and fulfilling country data needs, this approach has additional benefits, including the following:

* It promotes the collection of national-level performance and context indicators that are vital to understanding our contribution to national-level as well as ZOI-level change in the environment in which we are working.
* It offers better value for the USG because these surveys will cost approximately the same as contractor-implemented surveys and will provide national-level as well as ZOI-level data. Over time, this value should increase through leverage of partner government and other donor support. This could potentially be a model for other sectors as well.
* It adds important analytical value because all indicator data are from a single data source, including national-level indicators. This includes the possibility for conducting quasi‑experimental impact evaluations that compare results in the ZOI to similar areas outside the ZOI for key indicators.
* The World Bank LSMS team has decades of experience in providing technical assistance to implement household surveys in many countries; the LSMS team has active relationships with the majority of the target countries and can support countries in this effort.

While recognizing these significant benefits, BFS also recognizes that this approach is new and different, and comes with the risk that not all of the desired Feed the Future ZOI-level population-based indicators will be collected (hunger, stunting, and poverty are always collected by the LSMS-ISA, however). In particular, if a planned LSMS-ISA closely follows a Demographic and Health Survey (DHS), the NSO may not want to collect some of the Feed the Future nutrition outcome indicators, such as exclusive breastfeeding rates, again so soon.

These surveys are country-owned and led, so the NSO in a particular country will ultimately make decisions on the surveys, after negotiations with the LSMS-ISA+ team and consultations with the in-country Technical Working Group. For this reason, Post teams need to engage in the Technical Working Groups and, to the extent possible, play an active role in them; closely review the technical aspects of the survey; and advocate for the inclusion of the Feed the Future-required design features. They should also proactively engage in related donor groups to advocate for other donors’ support for the survey and other country-specific data systems strengthening efforts.[[4]](#footnote-4)

## 4.2. Contracting Stand-alone Surveys

Collecting survey data in the context of strengthening national data systems may not work in all countries in the short term. Post teams may choose to contract a firm to support a stand-alone survey that collects data only in the ZOI. Post teams must ensure that a well-qualified survey organization conducts the ZOI survey. Prior direct experience in organizing large-scale household surveys and collecting and analyzing the types of data required for the Feed the Future indicators are essential. Post teams contracting a stand-alone survey should closely mirror the [Feed the Future ZOI Survey Statement of Work](https://agrilinks.org/post/feed-future-zoi-survey-methods)[[5]](#footnote-5) (SOW) contained in the [Feed the Future ZOI Survey Methods Toolkit](https://agrilinks.org/post/feed-future-zoi-survey-methods)5 in procurement documents to ensure that all required steps are followed and all basic deliverables are correctly specified. Post teams should require that the survey implementers rigorously apply the technical guides, templates, and tools from the [Feed the Future ZOI Survey Methods Toolkit](https://agrilinks.org/post/feed-future-zoi-survey-methods)5 throughout the survey process. Use of the Toolkit is essential to address common issues faced in previous survey rounds and to increase the quality, reliability, standardization, and comparability of PBS data collected across the target countries.

Continual proactive oversight by Post teams of the survey implementer is essential throughout the entire survey process to ensure timely, high-quality data. The [ZOI Survey SOW template](https://agrilinks.org/post/feed-future-zoi-survey-methods)[[6]](#footnote-6) includes a comprehensive list of deliverables that survey implementers should submit to the Post team to facilitate and ensure adequate oversight. For example, regular review of the required weekly field check data tables will provide ongoing updates on data quality issues that are found during fieldwork and corrective actions that are taken in response.

### 4.2.1. Coordinating ZOI Stand-alone Surveys with Food for Peace Baseline and Endline Surveys

As a USG interagency Feed the Future partner, USAID’s Office of Food for Peace (FFP) has aligned its Development Food Security Activity indicators with the Feed the Future indicator set. FFP conducts baseline and endline population-based surveys in Development Food Security Activity implementation areas to collect population-based indicators. In countries with ongoing or planned Development Food Security Activities, Post teams should discuss with FFP and the BFS MEL TA the planned timeline for FFP and Feed the Future ZOI data collection and possible opportunities to collaborate and coordinate to reduce duplication of efforts and cost of collecting the data required for both purposes.

## 4.3 Timing of the P2-ZOI Baseline Survey

### 4.3.1 Length of the Survey Process

The entire P2-ZOI survey process for a stand-alone survey should take 18–20 months, from inception visit though delivery of final datasets, assuming that the materials in the [Feed the Future ZOI Survey Methods Toolkit](https://agrilinks.org/post/feed-future-zoi-survey-methods)6 are used. **This includes approximately 6–8 months of lead time before fieldwork begins.** The length of the survey process may vary across countries under the LSMS-ISA+ national data systems strengthening approach. The [Feed the Future ZOI Scope of Work for the Zone of Influence Survey](https://agrilinks.org/post/feed-future-zoi-survey-methods)6 provides a description with a Gantt chart that highlights different phases of survey planning and implementation.

Preceding the fieldwork, sufficient time should be allocated for the following:

* Preparatory activities for the survey should be undertaken, including meeting with government officials, obtaining information for the sampling plan, and developing a detailed survey activity and deliverables timeline in the form of a Gantt chart. If the contractor is not in country, this should be done through an **inception visit** as one of the first steps after contract award.
* If the contractor has decided to subcontract any aspect of the work to a subcontractor, time should be built into the schedule to allow for identification or solicitation and award.
* In-country and U.S.-based Institutional Review Board approval must be obtained with plenty of lead time.
* The survey instrument and protocol manuals should be reviewed, adapted, and translated to produce customized, country-specific versions of relevant documents. In the [Feed the Future ZOI Survey Methods Toolkit](https://agrilinks.org/post/feed-future-zoi-survey-methods),6 BFS provides core ZOI survey technical guides and templates, including the survey instrument and protocol manuals. These will save a great deal of time in the survey implementation process, but the tools and templates will improve data quality only if sufficient time and expertise is given to adapting the tools and templates to the local country context. The questionnaire and related materials should be translated and back-translated into native languages spoken by 10 percent or more of the ZOI population. All language versions of the survey instrument should be loaded on the tablet computers and be provided to the field teams in hardcopy.
* An updated household listing in selected enumeration areas (EAs) should be carried out prior to the second stage systematic sampling of households.
* Supervisor and interviewer training is another significant component of survey preparation and requires at least two weeks.

## 4.4 Timing of Fieldwork

Due to the collection of agricultural data, the timing of survey fieldwork is critical. To minimize recall bias, field data collection should begin as close as possible to the post-harvest season of the commodities that were selected as the three main value chains for the purpose of the survey. If the post-harvest season differs across the key commodities, the timing of survey fieldwork should be determined based on the timing of the post-harvest season for the most important commodity (in terms of number of producers in the ZOI).

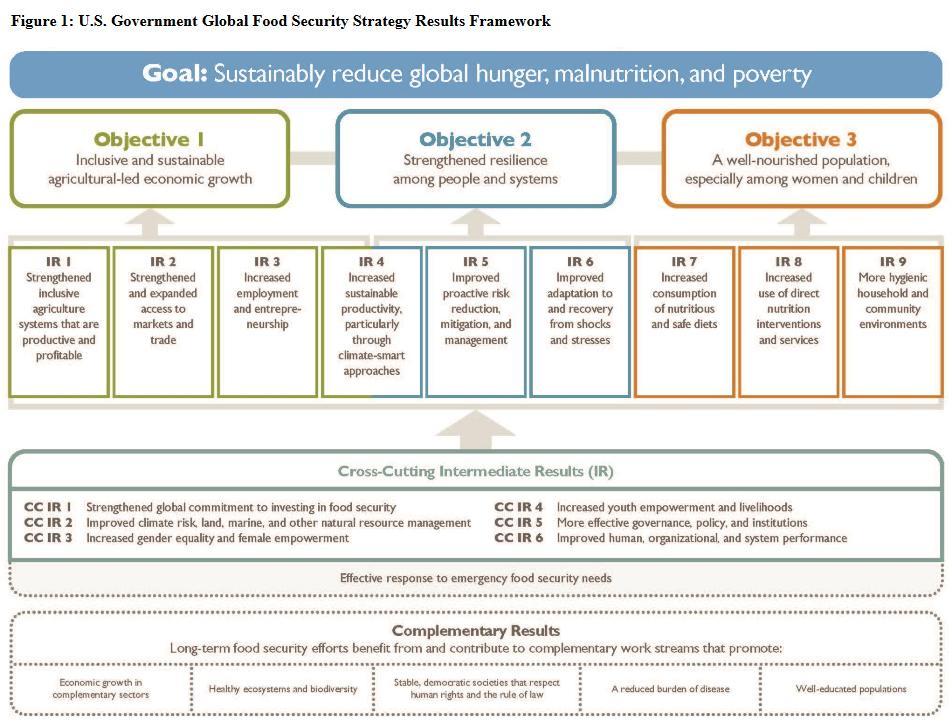
In addition, seasonal and cultural (e.g., major holidays, weather that impedes fieldwork), political and security issues (e.g., timing of elections or other events that may preclude fieldwork), and country- or Post-specific considerations should be taken into account when planning field data collection for the ZOI survey. Data for subsequent rounds of P2-ZOI surveys should be collected at the same time of year.

# 5. Indicators

## 5.1 P2-ZOI Baseline Indicators

Phase two of Feed the Future will monitor progress toward its goal of sustainably reducing global poverty and hunger using a suite of indicators that capture key steps along the impact pathway reflected in the GFSS Results Framework (see Figure 1).

Figure 1: U.S. Government Global Food Security Strategy Results Framework



Feed the Future phase two under the GFSS has identified a set of indicators to be measured at the population level through a PBS that is representative of the ZOI. Many P2 ZOI-level population-based indicators are the same as those collected under Feed the Future phase one or have been slightly modified. Several phase two population-based indicators are new, such as yield, application of improved agricultural practices, resilience capacities, and access to sanitation, and have been identified to fill important data gaps in measuring the causal pathway of the Feed the Future phase one results framework (see Appendix 1 for a list of the phase one and phase two indicators.) The 10 ZOI-level performance indicators at the Goal and Strategic Objective level are required for all target countries. The remaining 10 ZOI-level performance indicators are at the Intermediate Result level and are required as applicable (RAA). If the Post is implementing activities designed to contribute to the results measured by an RAA indicator, then it must report on that indicator. Post teams are required to set five-year targets for all 10 of the required and any selected RAA ZOI-level performance indicators and report progress against those targets.

Two phase two context population-based indicators are measured at the ZOI level and can be calculated from the data collected to quantify performance indicators (see Table 1). Context indicators help inform our understanding of the environment in which we are working and our interpretation of results. But we do not hold ourselves accountable for, nor do we set targets for context indicators.

Table 1: Feed the Future Phase Two ZOI-level Context Indicators

|  |
| --- |
| **Indicator title** |
| Prevalence of households that are near-poor: Percentage of households living at ≥ 100% and < 125% of the poverty line [ZOI-level] |
| Percentage of women who are achieving adequacy in the six indicators of the Abbreviated WEAI [ZOI-level] |

## P1-ZOI Endline Indicators

The P1-ZOI endline survey should collect data on any of the indicators for which data were collected during the P1-ZOI baseline.[[7]](#footnote-7)

## Collecting P1-ZOI Endline and P2-ZOI Baseline Indicators in the Same Questionnaire

The transition to Feed the Future phase two under the GFSS saw some changes to the measures used for poverty, hunger, women’s dietary diversity, and women’s empowerment indicators, which are described in this section. Feed the Future phase one focus countries that are continuing as target countries under phase two and planning to collect P1-ZOI endline and P2-ZOI baseline data in the same survey should note that they will need data for the indicators using both phase one and phase two measures when they differ. Using the core P2-ZOI questionnaire contained in the [Feed the Future ZOI Survey Methods Toolkit](https://agrilinks.org/post/feed-future-zoi-survey-methods)[[8]](#footnote-8) will ensure that all necessary data are collected.

### Poverty

The P1-ZOI prevalence of poverty indicator used the $1.25 at 2005 purchasing power parity (PPP) threshold, and the P2‑ZOI prevalence of poverty indicator uses the $1.90 at 2011 PPP threshold. The P1-ZOI depth of poverty indicator was changed to the P2-ZOI depth of poverty of the poor indicator. These can be computed at the analysis stage, using the data collected by the P2-ZOI questionnaire (see Table 2).

Table 2: 2005 PPP and 2011 PPP Conversion Factor, Private Consumption for Target Countries

(Local currency unit per international $)

|  |  |  |
| --- | --- | --- |
| **Feed the Future target countries** | **2005 PPP** | **2011 PPP** |
| Bangladesh | 25.49 | 24.849 |
| Ethiopia | 2.75 | 5.439 |
| Ghana | 0.45 | 0.788 |
| Guatemala | 4.54 | 3.873 |
| Honduras | 9.66 | 10.080 |
| Kenya | 32.68 | 35.430 |
| Mali | 289.68 | 221.868 |
| Nigeria | n/a | 79.531 |
| Niger | n/a | 228.753 |
| Nepal | 26.47 | 25.759 |
| Senegal | 298.24 | 246.107 |
| Uganda | 744.62 | 946.890 |

Sources: World Bank, World Development Indicators, Updated 11/15/2017, and Feed the Future Handbook of Indicator Definitions

### Hunger and Women’s Dietary Diversity

The measures for hunger and the quality of women’s diets have changed from Feed the Future phase one to Feed the Future phase two, as follows:

* The P1-ZOI indicator Prevalence of moderate and severe hunger using the **30-day recall** **Household Hunger Scale (HHS)** is replaced by the Prevalence of moderate and severe food insecurity using the **12-month recall** **Food Insecurity Experience Score (FIES)** under Feed the Future’s second phase.
* The P1-ZOI indicator Women’s dietary diversity score (WDDS) is now Minimum Dietary Diversity – Women (MDD-W): prevalence of women consuming a diet of minimum diversity.

The core ZOI Survey questionnaire contained in the [Feed the Future ZOI Survey Methods Toolkit](https://agrilinks.org/post/feed-future-zoi-survey-methods)[[9]](#footnote-9) is designed to collect data to quantify all four indicators. After asking the 12-month recall FIES questions, the interviewer will ask the 30-day recall HHS questions. The [core questionnaire](https://agrilinks.org/post/feed-future-zoi-survey-methods)9 food item data collection format allows the data analyst to create and analyze consumption of the nine food groups used to compute the WDDS and the 10 food groups used to compute the MDD-W (see Table 3).

Table 3. Creating the WDDS and MDD-W from the Food Groups in the ZOI Questionnaire

| **WDDS**  **(9 food groups)** | **Food groups in the core ZOI questionnaire** | **MDD-W**  **(10 food groups)** |
| --- | --- | --- |
| Grains, roots, and tubers | *Food made from grains, such as bread, rice, noodles, porridge, or [other local grain food]?* | Grains, roots, and tubers |
| *White potatoes, white yams, manioc, cassava, [other local root crops], or any other foods made from roots?* |
| Legumes, beans, nuts, and seeds | *Any foods made from beans, peas, or lentils, such as [add any local legume names]?* | Legumes and beans |
| *Any foods made from nuts or seeds, such as [add any local nut or seed names]?* | Nuts and seeds |
| Dairy products | *Milk, cheese, yogurt, or other milk products?* | Dairy products |
| Eggs | *Eggs?* | Eggs |
| Organ meat | *Any liver, kidney, heart, or other organ meats from domesticated animals, such as cattle, swine, goat, chicken, or duck?* | Flesh foods, including organ meat and misc. small animal protein |
| *Any liver, kidney, heart, or other organ meats from wild animals, such as [names of local commonly consumed wildlife]?* |
| Flesh foods and other misc. small animal protein | *Any meat, such as beef, pork, lamb, goat, chicken, or duck?* |
| *Any flesh from wild animals, such as [names of local commonly consumed wildlife]?* |
| *Fresh or dried fish, shellfish, or seafood?* |
| *Grubs, snails, or insects such as [add any local insect names]?* |
| Vitamin A-rich dark green leafy vegetables | *Any dark green leafy vegetables such as [local dark green leafy vegetables]?* | Vitamin A-rich dark green leafy vegetables |
| Other vitamin A-rich vegetables and fruits | *Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside, or [other local yellow/orange foods]?* | Other vitamin A-rich vegetables and fruits |
| *Ripe mangoes, ripe papayas, or [other local vitamin A-rich fruits]?* |
| *Foods made with red palm oil, red palm nut, or red palm nut pulp sauce?* |
| Other fruits and vegetables | *Any other vegetables?* | Other vegetables |
| *Any other fruits?* | Other fruits |
| **Consumption of the following food groups is not counted in the dietary diversity score:** | | |
|  | *Any oil, fats, or butter, or foods made with any of these?* |  |
|  | *Any sugary foods, such as chocolates, sweets, candies, pastries, cakes, or biscuits?* |  |
|  | *Condiments for flavor, such as chilies, spices, herbs, fish powder, or [add any local condiment names]?* |  |

### Abbreviated Women’s Empowerment in Agriculture Index

Feed the Future and its partners developed the Women’s Empowerment in Agriculture Index (WEAI) to measure the empowerment, agency, and inclusion of women in the agriculture sector. The WEAI is administered to primary female and male decision-makers in the same household and comprises two sub-indexes: The Five Domains of Empowerment (5DE), and the Gender Parity Index (GPI). The 5DE assesses the degree to which women are empowered in five domains of empowerment in agriculture: (1) decisions about agricultural production, (2) access to productive resources and decision-making power about those resources, (3) control over the use of income, (4) leadership in the community, and (5) time allocation. The 5DE also takes into account the percentage of women who are empowered in the individual domains that do not meet the empowerment threshold. The GPI measures gender parity in surveyed households and reflects the percentage of women who are equally as empowered as men in their households. For those households that have not achieved gender parity, the GPI shows the empowerment gap that needs to be closed for women to reach the same level of empowerment as men. The WEAI is a weighted score composed of 90 percent of the 5DE score and 10 percent of the GPI score.

The original WEAI has been replaced by the Abbreviated WEAI (A-WEAI). The A-WEAI is a shorter, streamlined version of the original WEAI and incorporated lessons learned in applying the original WEAI. All five domains are retained, but there are now six indicators instead of the original 10, and it takes approximately 30 percent less time to administer than the original WEAI. The A-WEAI also includes a simplified time module that collects recall on only primary activities over a 24-hour period and streamlined sections on production decisions and resources. A comparison of the domains and indicators in the original WEAI and the A-WEAI is shown in Table 4.

Table 4: WEAI and A-WEAI Indicators

Note: Weights in index appear in parentheses.

|  |  |  |
| --- | --- | --- |
| **Domain** | **WEAI: 10 indicators** | **A-WEAI: 6 indicators** |
| Production | * Input in productive decisions (1/10) * Autonomy in production (1/10) | * Input in productive decisions (1/5) |
| Resources | * Ownership of assets (1/15) * Purchase, sale, or transfer of assets (1/15) * Access to and decisions on credit (1/15) | * Ownership of assets (2/15) * Access to and decisions on credit (1/15) |
| Income | * Control over use of income (1/5) | * Control over use of income (1/5) |
| Leadership | * Group membership (1/10) * Speaking in public (1/10) | * Group membership (1/5) |
| Time | * Workload (1/10) * Leisure (1/10) | * Workload (1/5) |

The [Feed the Future core questionnaire](https://agrilinks.org/post/feed-future-zoi-survey-methods)[[10]](#footnote-10) collects data for the A-WEAI only. For countries that that 1) have not had significant changes in the geography of the P1-ZOI between the baseline in 2010-2013 and present, and 2) plan on collecting P1-ZOI endline and P2-ZOI baseline data in the same survey using the [core questionnaire](https://agrilinks.org/post/feed-future-zoi-survey-methods)10, BFS can provide assistance through the International Food Policy Research Institute to compute P1-ZOI baseline A-WEAI values from the P1-ZOI baseline WEAI data. Then Post teams can compare P1-ZOI A-WEAI baseline values with the A-WEAI values collected at endline using the [core questionnaire](https://agrilinks.org/post/feed-future-zoi-survey-methods)10. Clean, analyzable P1-ZOI baseline datasets with metadata and codebook must be available for this assistance to be provided. Post teams should consult with their BFS MEL TA for more information.

## National-level Indicators

The list of phase two indicators also includes a number of national-level indicators, seven of which are SDG indicators. Many are the same as the ZOI-level indicators, but they are measured at the national level. The goal-level hunger, stunting, and poverty performance indicators are measured at both the ZOI level and the national level and recognize the fact that Feed the Future is holding itself responsible for not only contributing to changes in the ZOI but also supporting gains at the national level. Feed the Future hunger, stunting, and poverty targets at the national level will be the same as the targets set by the national government for these three SDG indicators. Appendix 2 provides a list of the phase two national-level performance and context indicators.

Post teams are required to report data on national-level PBS performance and context indicators only when data are available to do so. Post teams are not required to fund national‑level data collection for these indicators; however, it is worth noting that increased availability of timely and quality national-level data on performance and context indicators is a benefit of buying into the LSMS-ISA+ or supporting another national household survey for data collection, as described in Section 4.1.

# 6. ZOI Survey Sample Design

ZOI surveys should use a cross-sectional, stratified, multi-stage cluster design, with three (or four) stages of sampling.[[11]](#footnote-11) EAs should be selected using systematic probability proportional to size (PPS) in the first phase; if applicable, EA segments should be selected using PPS in the second stage; households should be selected using fractional interval systematic sampling[[12]](#footnote-12) in the third stage; and eligible household members should be selected using “take all” sampling at the fourth stage. “Take all” sampling means that all household members who meet the eligibility criteria to respond to specific questions or have measurements taken (e.g., children under five for stunting, wasting, and healthy weight indicators; women of reproductive age for underweight and minimum dietary diversity indicators; producers of key commodities for application of improved practices and yield indicators) should be included in the sample, and no subsampling among eligible members should occur. Table 5 summarizes the methods for the sampling stages.

Table 5: Summary of Methods for Each Stage of Sampling

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Stage 1: Selection of EAs** | **Stage 2: Selection of segments** | **Stage 3:**  **Selection of households** | **Stage 4: Selection of individuals** |
| Method of sampling | Systematic PPS | PPS | Fractional interval systematic | Take all |

## P2-ZOI Survey Integrated into Ongoing Panel Survey

Feed the Future recognizes the value that panel surveys[[13]](#footnote-13) bring to our ability to understand important dynamics underlying the outcomes we seek and that these surveys make valuable contributions to the evidence base for effective policy and programming. Although panel surveys may be ideal for those purposes, they are not ideal for the purposes of estimating indicator values that are representative at the population level at different points over time. There are at least two challenges with using panel surveys to estimate representative ZOI indicator values over time. The first is attrition, that is, some households do not continue to participate in the panel for reasons that include relocation, death, and non-response. All panels suffer attrition, and this attrition is often significant in terms of the number of households lost over time, and sometimes it is systematic in terms of households with certain characteristics being more likely to drop from the panel than other households. The former would affect sample size and the latter could introduce bias. In addition, panel households are likely to have on average older members than the overall population because they are a fixed set of households that have been followed for a number of years, although this can be mitigated if “spin-off” households have been tracked and integrated into the panel.

Some Feed the Future phase two target countries have ongoing surveys that could serve as a platform to collect the next rounds of ZOI data, including countries with established LSMS-ISA surveys. If the ongoing survey is a panel survey, three options should be considered to meet the dual objectives of continuing the panel and estimating representative baseline values for Feed the Future indicators. This section describes the three options, with the advantages and limitations of each. They are listed in order of preference, with the first option being the most preferred.

**Option one (most preferred):** This option involves drawing a cross-sectional sample (NC) that is completely independent of the panel sample (NP) and collecting the cross-sectional and panel data (NP) separately (i.e., two separate samples), although the fieldwork should be integrated logistically to the extent that it is feasible and appropriate. In this case, the total sample size for the overall survey is NC + NP. Contractors would use the cross-sectional sample data only to compute P2-ZOI baseline indicator values. They would analyze the panel data separately.

**Advantages:** This option completely eliminates the potential sample size and bias effects of using panel households to calculate baseline values.

**Limitation:** This approach is the costliest because it involves drawing two separate samples (although they may be combined logistically), and thus has the largest combined sample size and the greatest number of EAs that would need to be visited.

**Option two:** This option involves collecting data only in the EAs where the panel households are located (i.e., the location and number of EAs are predetermined) and drawing a new cross‑sectional sample of households in each of the panel EAs after conducting a household listing in each EA. The steps under this option are as follows:

Calculate the required P2-ZOI sample size (NZ).

Calculate the number of households to be sampled per EA (NE) based on the required P2-ZOI sample size and the number of EAs already selected in the P2-ZOI (i.e., the EAs where the panel households are located).

Conduct a new household listing in the selected EAs.

Draw a random sample of NE households in each EA from all the households on the list. The resulting NE may or may not contain panel households.

Collect data for those selected NE households plus any non-selected panel households.

Only use NZ households for ZOI-related calculations or analysis.

Analyze the set of panel households separately for any panel-related analysis.

**Advantages:**

* Because the listing exercise in each EA produces an updated second stage sample frame, this option results in a completely new second stage sample, greatly decreasing the possibility of bias from the panel sample.
* Costs are lower than option one because the panel and cross-sectional surveys are combined logistically, fewer EAs need to be visited, and the total survey sample size may be somewhat lower.

**Limitations:**

* This option could result in a larger number of households per EA than option one, depending on the total number of EAs in the panel sample. A larger number of households per EA would result in a larger survey design effect and a lower probability of capturing statistically significant change over time in the indicators. Depending on the number of panel EAs relative to the P2-ZOI required sample size, NE could be quite large and could even exceed the recommended maximum of 25–30 households per EA.
* The total number of households to be interviewed in each EA would vary, depending on how many panel households fall in NE. This would introduce logistical challenges for planning and managing the teams, because the time each team would be required to be in each EA would vary.

BFS strongly encourages Post teams to choose one of the two options above, either of which will result in an independent cross-sectional sample being drawn, and accept any increased cost involved, if the Post team wants to maintain the panel.

**Option three:** A less-than-ideal scenario may arise in a few World Bank-supported ongoing LSMS-ISA countries. This scenario involves including the full panel sample (Np) in the P2-ZOI sample and collecting data from however many additional households are required per panel EA to meet the P2-ZOI overall sample requirements. There are, as listed below, many and considerable limitations with this approach, and BFS strongly encourages Post management to allocate sufficient resources to the ZOI survey to avoid this option. The steps under this approach are as follows:

Calculate the required P2-ZOI sample size (NZ).

Subtract the panel sample size (Np).

Calculate the number of additional households (“oversample households”) to be sampled per EA (NA) by dividing the remaining ZOI sample size (NZ - Np) by the number of EAs already selected in the ZOI (i.e., the EAs where the panel households are located).

Conduct a new household listing in the selected EAs.

Exclude the existing panel households from the household list.

Draw a random sample of NA households in each EA from the remaining households on the list.

Collect data for those NA households plus the Np panel households.

Use NA + Np for ZOI calculations.

Analyze the set of panel households separately for any panel-related analysis.

**Advantages:**

* Costs are lowest under this option because fewer EAs need to be visited (than under option one), and the total survey sample size is the smallest of the three options.
* Because the listing exercise in each EA produces an updated second stage sample frame, this option results in a sample that includes at least some reflection of changes in the ZOI population and new households formed since the panel was drawn.

**Limitations:**

* Any attrition in the panel will reduce overall sample size.
* The panel sample has disproportionate weight in the overall sample under this option, which introduces the highest potential for bias because the panel is likely to have been affected by at least some attrition over time, and, certainly as a group, represents a population that is getting steadily older and thus less representative of the overall ZOI population.
* This option requires a much more complicated process to calculate sample weights. Survey implementers must have demonstrated expertise (and ability to describe their approach) to address the dual sample frame with unknown overlap issue that results from drawing the oversample NA households from an updated EA listing (sample frame) that excludes the panel households and includes some unknown proportion, possibly all, of the households that were listed at baseline plus any new households. Households that were in the EA but not selected when the panel was drawn at baseline are represented twice in the sample because they get a second chance at being selected after the endline EA listing.
* This option will require data collection contractors to conduct additional and complicated statistical analyses to attempt to identify and correct for any bias due to attrition when estimating ZOI indicators. Post teams must clearly understand how survey implementers will identify, document, and address any potential overall and key indicator-specific attrition bias in weighting and analyzing the results.
* This option also could result in a larger number of households per EA than option one, depending on the total number of EAs in the panel sample, with the resultant increase in survey design effect and decrease in the probability of capturing statistically significant change over time.

# 7. Sample Size

## 7.1 P2-ZOI Baseline Sample Size

### 7.1.1 Indicators on Which to Base P2-ZOI Baseline Sample Size

The P2-ZOI baseline sample size should be the largest of the sample sizes required to capture a defined level of change over time in the Feed the Future phase two goal-level indicators for hunger, malnutrition, and poverty. The following indicators are used to calculate the sample size:

* Prevalence of moderate or severe food insecurity in the population, based on the FIES
* Prevalence of stunted (HAZ < -2) children under five years of age
* Prevalence of poverty: Percentage of people living on less than $1.90/day 2011 PPP

This section outlines the parameters that should be used and steps to follow to determine the required sample size for each indicator and the final sample size for the P2-ZOI baseline survey.

### 7.1.2 Sample Size per Indicator

The sample size for each indicator depends on an *estimated baseline value,* the *amount of change* to capture over five years, the desired *degree of confidence* to capture that change, and the *expected design effect* of the survey. In addition, the stunting indicator sample size must account for the number of households that would need to be visited to find the required number of children, and sample sizes for all three indicators must include a cushion of additional households in case some of the selected households decline to be interviewed.

Once the sample size parameters have been determined, Post teams can use the sample size calculator on the [Feed the Future ZOI Survey Methods website](https://agrilinks.org/post/feed-future-zoi-survey-methods)[[14]](#footnote-14) to determine the final sample sizes for the prevalence of food insecurity, stunting, and poverty. Appendix 3 contains the steps and formulas the sample size calculator uses.

#### Estimated Baseline Values for 2018/2019

Posts should identify a source of data for the *estimated baseline values* for the prevalence of hunger, stunting, and poverty in the P2-ZOI. Secondary data sources such as the P1-ZOI interim survey and recent national poverty and demographic and health surveys, such as DHS, Multiple Indicator Cluster Survey, or LSMS, are the most likely sources. Posts should use appropriate population weights to generate estimates for P2-ZOI.

P2-ZOI estimates from the secondary source should be projected from the date the secondary data were collected to the estimated 2018 or 2019 baseline value (depending on when the ZOI survey is planned). Post teams could use the Feed the Future phase one initiative-level average rates of change in these indicators observed between baseline and interim in the P2‑ZOIs to make this projection (see Table 7). Post teams in former focus countries could also use the country-specific average annual rate of change (AARC) observed between baseline and interim in the P1-ZOI, if the AARC was statistically significant.

#### Indicator-specific Considerations

##### Poverty

The Feed the Future phase one poverty-related indicators used the internationally comparable $1.25 at 2005 PPP extreme poverty line threshold, which was the threshold used for the Millennium Development Goal poverty indicator. The phase two indicators use the internationally comparable $1.90 at 2011 PPP threshold, which is the threshold used by the SDGs poverty indicators.

The most recent national-level estimates of the prevalence of poverty at the $1.90 threshold are available from the World Bank databank.[[15]](#footnote-15) If survey implementers followed the Feed the Future template, former focus country P1-ZOI interim indicator assessment reports should include a table with ZOI-level prevalence and depth of poverty indicator values at the $1.90 2011 PPP threshold as well as the $1.25 2005 PPP threshold. Post teams can decide whether the national or P1-ZOI prevalence estimate serves as a better basis for the P2-ZOI baseline estimate.

Note: It is possible that the resulting estimated P2-ZOI baseline prevalence of poverty at the $1.90 threshold may be very low (e.g., below 15 percent). Capturing change over time in indicators of proportions that are at low levels to begin with can require very large sample sizes (in the tens of thousands.) In these cases, Post teams can drop the poverty indicator from the set of indicators used to determine the ZOI survey sample size or use prevalence of poverty at the national poverty or extreme poverty line instead.

##### Hunger and Food Insecurity

Estimating the P2-ZOI baseline value for the Feed the Future phase two prevalence of moderate and severe food insecurity based on the FIES indicator will be challenging because it is a relatively new indicator and was not measured under Feed the Future phase one. The FIES measures a broader range of food insecurity experiences than the phase one prevalence of hunger based on the HHS indicator, which focuses on the severe end of the food insecurity experience (e.g., going a whole day without eating because of lack of resources, having no food in the house and no resources to obtain more). The FIES covers a longer period of time, asking respondents to talk about their experience over the past 12 months; the HHS asks only about the last 30 days. Because of this short recall period, the HHS is sensitive to the season in which it is collected, and prevalence and changes in prevalence must be interpreted in that light. Finally, the FIES collects experiences of individual adults, and the HHS measures experiences at a household level.[[16]](#footnote-16) These differences between the indicators means that Post teams in focus countries continuing as target countries should proceed with caution when using ZOI interim values for HHS to estimate baseline values for FIES; however, these HHS values can potentially be useful.

Currently, 2014 data on the national-level prevalence of moderate and severe food insecurity based on the FIES are available for 140 countries,[[17]](#footnote-17) including all Feed the Future target countries. Post teams in countries with an interim P1-ZOI HHS value available could refine the estimate by assuming that the ratio of **moderate plus severe food insecurity** to **severe food insecurity alone** under the FIES applies to the HHS. Multiplying the P1-ZOI interim HHS value by this ratio would provide an estimate of the level of moderate plus severe food insecurity (hence, the FIES) at interim, and teams could then assume that this value was also the P2-ZOI FIES value in the same year that the P1-ZOI interim was conducted. Alternatively, and in countries that do not have data on HHS, Post teams could simply use the national prevalence as the P2-ZOI baseline estimate.[[18]](#footnote-18)

Table 6 provides the baseline and interim HHS values for the Feed the Future phase one focus country ZOIs. The time of year in which baseline and interim HHS data were collected varied significantly in 5 of the 11 countries, as highlighted in yellow. The table also contains the 2014 FIES estimates for all phase two target countries and the ratio of moderate plus severe to severe food insecurity at the national level based on the FIES.

Table 6: Baseline and Interim HHS Values and FIES Estimates

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **FTF focus country** | **Baseline year** | **Baseline months** | **Prev. of hunger ZOI baseline** | **Interim year** | **Interim months** | **Prev. of hunger ZOI interim** | **Prev. of moderate + severe FIS (FIES 2014) \*Guate 2011** | **Prev. of severe FIS (FIES 2014)** | **Ratio mod+ sev/sev FIES** | **Estimated Mod+sev FIS based on HHS prev \* FIES ratio** |
| Bangladesh | 2011 | Oct–Nov | 8% | 2015 | Jan–Mar | 6% | 34% | 11% | 3.10 | 17% |
| Ethiopia | 2013 | Jun–Jul | 5% | 2015 | Jun–Jul | 5% | 48% | 12% | 4.00 | 20% |
| Ghana | 2012 | Jul–Aug | 39% | 2015 | Jul–Aug | 30% | 49% | 23% | 2.16 | 64% |
| Guatemala |  |  |  |  |  |  | 45% | 11% | 4.10 |  |
| Honduras | 2012 | Jun–Jul | 4% | 2015 | May–Aug | 4% | 56% | 23% | 2.41 | 10% |
| Kenya HR1/SA2 | 2013 | Jan–Feb | 14% | 2015 | Mar–May | 14% | 58% | 32% | 1.83 | 26% |
| Kenya NAL | 2013 | Jan–Feb | 60% | 2015 | May–Jun | 55% |
| Mali |  |  |  |  |  |  | 18% | 3% | 6.88 |  |
| Nepal | 2013 | Apr–May | 11% | 2015 | Aug–Sept | 9% | 21% | 8% | 2.55 | 23% |
| Niger |  |  |  |  |  |  | 58% | 18% | 3.20 |  |
| Nigeria |  |  |  |  |  |  | 53% | 27% | 2.00 |  |
| Senegal | 2012/13 | Dec–Jan | 29% | 2015/16 | Dec–Jan | 22% | 23% | 5% | 4.17 | 91% |
| Uganda | 2012 | Dec | 27% | 2015 | Mar–Apr | 28% | 70% | 36% | 1.93 | 55% |

#### Amount of Change to Capture

Post teams will establish final targets for the desired ambitious yet achievable change in the population-based indicators that the team is targeting over a five-year period after baseline values have been collected, and BFS will issue guidance to assist with this effort. For P2-ZOI baseline sample size calculation purposes, Post teams should consider the **minimum** amount of change that would represent “meaningful change” over a five- or six-year period (depending on when the endline will be conducted) in prevalence of hunger, stunting, and poverty, and ensure that the sample size is sufficient to capture it. “Meaningful change” means that important and consequential progress in reducing hunger, stunting, and poverty has been made, even if more ambitious targets are not achieved.

To determine a minimum amount of meaningful change, BFS recommends that Post teams in countries that are former focus countries and are continuing as target countries use the AARC achieved for each of the three indicators in the P1-ZOI between baseline and interim, if that change was statistically significant. Note that BFS considers a continuation of current rates of change to be meaningful and achievable but not necessarily ambitious and would expect to see Post teams build in some degree of acceleration in the current rates of change when setting their five-year performance targets (to be done after baseline values are collected). Determining the ZOI survey sample size based on more conservative estimates of change, as reflected in existing rates of change, will ensure that the sample is large enough to capture progress made toward more ambitious targets.

In cases in which the change between baseline and interim was not statistically significant, or for Feed the Future phase two target countries that were not Feed the Future phase one focus countries, Post teams should use the time-weighted AARC achieved on average across all Feed the Future phase one focus country ZOIs, as shown in Table 7.[[19]](#footnote-19)

Table 7. Average Annual Rate of Change in Poverty, Hunger, and Stunting in Feed the Future P1‑ZOIs in Feed the Future Focus Countries with Available Data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Interim prevalence**  **(weighted by ZOI population)** | **Ave AARC (%)**  **(not weighted)** | **Total percentage change over a five-year period** | **Total percentage change over a six-year period** |
| Hunger (HHS) | 12.7 | -4.1 | -18.9% | -22.2% |
| Stunting | 31.9 | -3.4 | -15.9% | -18.7% |
| Poverty | 35.7 | -2.5 | -11.9% | -14.1% |

Note: Available data exclude Mali. Hunger data additionally exclude Cambodia and Tanzania.

#### Degree of Confidence to Capture Change

*Statistical significance,* the alpha (α) error, reflects the degree of confidence that, if measured, the targeted meaningful change would not have occurred by chance. *Statistical power,* calculated as one (1) minus the beta (β) error, reflects the degree of confidence that a change of at least the meaningful size will be detected, if one actually occurred. Post teams should use the standard alpha level of 0.05 (also known as 95 percent significance) and the standard beta level of 0.20 (also known as 80 percent power) for the P2-ZOI baseline sample size calculation.

#### Design Effect

The design effect is an adjustment made to the sample size because of the multi-stage sampling method used, which deviates from a simple random sampling. BFS recommends Post teams use estimated design effects of **five** for poverty and hunger and **two** for stunting, based on the average design effects found in the Feed the Future P1-ZOI surveys for the poverty indicator, the Gallup World Poll for the FIES-based hunger indicator, and common practice for stunting.

### 7.1.3 Final P2-ZOI Sample Size

The final P2-ZOI sample size is the largest of the sample sizes calculated for the three goal‑level indicators for hunger, stunting, and poverty.[[20]](#footnote-20)

## 7.2 P1-ZOI Endline Sample Size

The sample size for the Feed the Future P1-ZOI endline survey was determined at baseline because capturing change over time requires collecting the same size sample at baseline and endline. Post teams should refer to the sampling calculations done for the P1-ZOI baseline and plan on collecting data for the same number of households. If Post teams want to change the P1-ZOI endline sample size, they should consult with their BFS MEL TA.

## 7.3 Dual Purpose Baseline/Endline PBS Sample Size

The final sample size of a dual purpose P1-ZOI endline/P2-ZOI baseline survey is determined by two factors: (1) the required sample size for each survey, and (2) the geography of the P1‑ZOI and P2-ZOI, and in particular, the proportion of each ZOI population that overlaps with the other.

Post teams should first calculate the required sample size for each ZOI independently. Next, teams should determine the total population of households or individuals (depending on which measure of size is used in the sample frame) in each ZOI and the proportion of each ZOI population in the overlap and non-overlap areas of the ZOI. Finally, teams should use these proportions to divide the total sample for each ZOI between overlap and non-overlap areas. See Figure 2.

Figure 2: Example of overlap between P1-ZOI and P2-ZOI

P2-ZOI non‑overlap

P1-P2 ZOI overlap

P1-ZOI non‑overlap

Divide P1-ZOI sample between overlap and non-overlap areas using proportional allocation

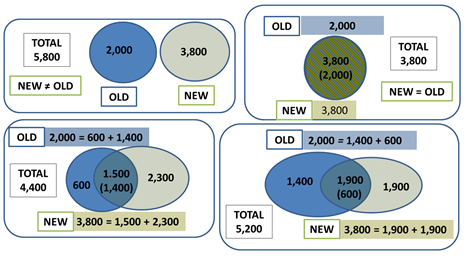
Divide P2-ZOI sample between overlap and non-overlap areas using proportional allocation

In most cases, the size of the sample in the P1-P2 ZOI overlap area calculated from the P1‑ZOI endline sample will be different (i.e., either smaller or larger) from that of the P2-ZOI baseline sample. If the two ZOI surveys are being administered using the same survey vehicle and the same questionnaire as recommended, the larger sample in the overlap area should be retained and the required number of EAs and households for the larger sample should be selected from the sample frame of the corresponding ZOI. The data collected from those households will then be used to meet sample requirements for both surveys.

In cases in which the geographic areas of the P1-ZOI and the P2-ZOI are the same (i.e., there is a 100 percent overlap), data from the larger sample should be used for both analyses. Where the P1-ZOI and P2-ZOI partially overlap, BFS recommends that a random sample of cases (i.e., households) equal to the smaller sample size should be drawn from the total overlap dataset when the data are ready for analysis and combined with the remaining sample for analysis (i.e., a sub-sample approach). This is better than using all of the cases from the overlap dataset, which carries a risk of reducing the overall precision of estimates due to uneven weighting.

The final sample size for a dual-purpose ZOI survey will be determined by the extent of overlap between the P1-ZOI and the P2-ZOI. For example, the combined sample size required to meet individual ZOI sample requirements of 2,000 households in the P1-ZOI and 3,800 households in the P2-ZOI can range from 3,800 in countries where the two ZOIs overlap completely (i.e., the P2-ZOI geographic area is the same as the P1-ZOI geographic area) to 5,800 in countries where there is no overlap at all (i.e., the P2-ZOI geographic area is completely different from the P1-ZOI area). In the example shown in Figure 3, the required P1-ZOI endline sample size is 2,000, and the P2-ZOI baseline sample size is 3,800. Numbers in the Venn diagrams show the proportional allocation of each sample between overlap and non-overlap areas. The number in parentheses is the smaller overlap sample requirement. “TOTAL” is the combined sample size needed to meet the sample requirements of both surveys, assuming that they are jointly administered.

Figure 3: Dual-purpose ZOI Survey Sample Size under Different Overlap Scenarios



## 7.4 Stratification and Sample Allocation

In general, the stage one sample frame of EAs should be stratified, that is, ordered geographically (e.g., by district) and by urban and rural EAs in each geographic stratum before the first stage sample selection. This will help reduce the standard error and increase the precision of the indicator estimates.

As long as every household in each stratum has a known and non-zero probability of being randomly selected in the sample, the sample is **representative** at the stratum level. Note, however, that this does not mean that indicator estimates calculated at the level of each stratum will have the same level of **precision** as the overall ZOI-level estimates. To obtain the same level of precision at the stratum level, teams would need to collect the same size sample at the stratum level that had been calculated for the ZOI level—in other words, to multiply the ZOI sample size by the number of strata of interest. In many cases, this results in a sample size larger than the Post team is able to support given funds available, even if the team is interested in precise estimates at a sub-ZOI level.

After sample strata have been defined, the overall sample needs to be allocated (i.e., divided) among the strata. There are three ways to do this. First, the sample can be allocated proportionally to the population (of households or individuals) in each stratum. Second, the sample can be allocated equally among the strata (equal allocation). Proportional allocation favors the precision of ZOI-level estimates, and equal allocation favors the precision of stratum-level estimates. The third way is a power allocation, which is a compromise allocation scheme between proportional allocation and equal size allocation and is the BFS recommendation. Post teams should use a power of 0.5 for the power allocation, because this is a value that is often used in practice. For more information and the sample allocation formula, see the [Feed the Future Sampling Guide for Population-Based Surveys](https://agrilinks.org/post/feed-future-zoi-survey-methods)[[21]](#footnote-21).

If the ZOI survey is a dual-purpose baseline/endline survey, the stage one sample frame (of EAs in the combined P1-ZOI and P2-ZOI) should be stratified first as follows: (1) the P1-ZOI non‑overlap area, (2) the P2-ZOI non-overlap area, and (3) the P1-P2 ZOI overlap area. Then it should be stratified geographically within each of those strata. The overall ZOI sample should first be allocated proportionally among the three ZOI strata, and then allocated among sub‑strata in the three ZOI strata using power allocation.

## 7.5 Number of Households to Interview per Enumeration Area

After the sample has been allocated among the sub-strata, the number of EAs that need to be selected per sub-stratum should be calculated. To calculate this, the sample size per sub‑stratum is divided by the number of households to be interviewed per EA. BFS recommends that data be collected from 20 to 30 households per EA, which provides a reasonable compromise between logistical and statistical efficiency.[[22]](#footnote-22) BFS also recommends that a minimum of two EAs be assigned per stratum to increase the likelihood that data from a minimum of 30 households are collected after accounting for any non-response. This will ensure a minimum level of statistical representativeness at the sub-stratum level.

# 8. Data Analysis and Report

Post teams should ensure that survey implementers follow the [Feed the Future Guide to ZOI Survey Statistics](https://agrilinks.org/post/feed-future-zoi-survey-methods)21 and the [ZOI Survey Data Treatment and Analysis Plan](https://agrilinks.org/post/feed-future-zoi-survey-methods)21 from the Feed the Future ZOI Survey Methods Toolkit to ensure that data are cleaned, missing values are handled, indicators are computed, and analyses are conducted correctly and uniformly. Survey implementers should present the methods and results of the survey using the [ZOI Survey Report Template](https://agrilinks.org/post/feed-future-zoi-survey-methods)21 to ensure that all required information is included in the report. Post teams should feel free to add sections to the template to report on country-specific indicators and analyses. The report represents an important opportunity to make data publicly available. Post teams should think broadly when detailing additional country- and ZOI-specific analyses to be conducted and reported.

For all analysis, survey implementers must use appropriate specialized statistical software packages, such as Stata, SPSS, and R that can take into account the complex design features of PBSs, such as clustering and unequal probabilities of selection, to generate indicator estimates with confidence intervals and standard errors. Spreadsheet packages such as Excel should not be used. It is critical that the correct syntax for complex survey designs be used, and therefore users should familiarize themselves with such software before undertaking any data analysis. The [ZOI Survey Toolkit](https://agrilinks.org/post/feed-future-zoi-survey-methods)21 contains the [Feed the Future Guide to ZOI Statistics](https://agrilinks.org/post/feed-future-zoi-survey-methods)21and Stata [Data Analysis Programs](https://agrilinks.org/post/feed-future-zoi-survey-methods)23 for cleaning and manipulating the data, constructing the indicators, conducting the analysis, and producing the required information.

Feed the Future indicator estimates must represent the entire ZOI population, not just the individuals and households that were interviewed in the survey sample. To produce these estimates, sampling weights for each data point are needed to “inflate” the data from each of the sampled individuals or households that respond, so that sample-weighted estimates produced from the surveyed individuals and households provide an estimate of the proportion or mean (depending on the indicator in question) for the entire ZOI population. All individuals and households included in their respective sampling frames have an underlying chance or probability of being included in the sample. Sample weights adjust for (1) probabilities of selection at each stage of sampling, and (2) non-response at the individual and household levels. The [Feed the Future Sampling Guide for Population-Based Surveys](https://agrilinks.org/post/feed-future-zoi-survey-methods)[[23]](#footnote-23) in the [Feed the Future ZOI Survey Toolkit](https://agrilinks.org/post/feed-future-zoi-survey-methods)23 provides detailed instructions on computing sample weights. The ZOI Survey Report (see [template](https://agrilinks.org/post/feed-future-zoi-survey-methods))23 should present indicator estimates, standard deviations (for indicators that are means), standard errors, and confidence intervals that have been correctly weighted. Tables and narrative should present the unweighted number of sample units to clearly communicate actual achieved sample size (i.e., the number of cases on which the estimate is actually based).

In addition to the report, Post teams should require that the survey implementer prepare and submit two datasets: one for USAID internal use and one for public use prepared according to the USG’s Open Data Policy.[[24]](#footnote-24) The USAID internal use dataset will include key recoded variables and retain allowable analytical personally identifiable information variables (e.g., non-displaced geospatial information); it must be transmitted to USAID in accordance with ADS Chapter 508 and include the metadata and codebook. The public use dataset will protect respondent privacy and confidentiality by removing or masking identifying information from the data, including direct identifiers (information such as names, addresses, global positioning system coordinates, or any other personally identifying number or characteristic) and indirect identifiers (data that do not specifically identify a person or location but that can be used to do so, one variable at a time or in combination, because they uniquely describe a person or household). The internal and public use datasets should be provided within 30 calendar days after the ZOI survey final report is produced.

Post teams should consider whether Mission, host country or partner staff would benefit from training on the ZOI survey datasets to encourage more in-depth analysis and should include such capacity-building in the ZOI survey contract and training plans.

Appendix 1: Feed the Future Phase One and Phase Two ZOI-level Indicators

Appendix 1 Table: Feed the Future Phase One and Phase Two ZOI-Level Indicators

| **Indicator title** | **P1 R** | **P1 RAA** | **P1 optional** | **P2 R** | **P2 RAA** | **P1&P2 R** | **P1&P2 RAA** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Prevalence of poverty: Percent of people living on less than $1.90/day 2011 PPP |  |  |  | X |  |  |  |
| Depth of poverty of the poor: Mean percent shortfall of the poor relative to the $1.90/day 2011 PPP poverty line |  |  |  | X |  |  |  |
| Prevalence of poverty: Percent of people living on less than $1.25/day | X |  |  |  |  |  |  |
| Depth of poverty: Mean percent shortfall relative to the $1.25 poverty line | X |  |  |  |  |  |  |
| Daily per capita expenditures in USG‑assisted areas | X |  |  |  |  |  |  |
| Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES) |  |  |  | X |  |  |  |
| Prevalence of households with moderate or severe hunger |  | X |  |  |  |  |  |
| Asset-based Wealth Index |  |  |  | X |  |  |  |
| Yield of targeted agricultural commodities within target areas |  |  |  |  | X |  |  |
| Proportion of producers in the targeted area who have applied targeted improved management practices or technologies |  |  |  |  | X |  |  |
| Proportion of households with the self‑perceived ability to successfully manage future shocks and stresses |  |  |  | X |  |  |  |
| Proportion of households with high social capital |  |  |  |  | X |  |  |
| Proportion of households that believe local government will respond effectively to future shocks and stresses |  |  |  |  | X |  |  |
| Proportion of households participating in group-based savings, micro-finance, or lending programs |  |  |  |  | X |  |  |
| Abbreviated Women’s Empowerment in Agriculture Index (A-WEAI) score | X |  |  |  |  |  |  |
| Women’s Empowerment in Agriculture Index |  |  |  | X |  |  |  |
| Prevalence of stunted (HAZ < -2) children under five years of age | X |  |  | X |  | X |  |
| Prevalence of wasted (WHZ < -2) children under five years of age | X |  |  | X |  | X |  |
| Prevalence of underweight (WAZ < -2) children under five years of age | X |  |  |  |  |  |  |
| Prevalence of healthy weight (WHZ ≤ 2 and ≥-2) among children under five years of age |  |  |  | X |  |  |  |
| Prevalence of underweight (BMI < 18.5) women of reproductive age | X |  |  | X |  | X |  |
| Prevalence of children 6-23 months receiving a minimum acceptable diet |  | X |  |  | X |  | X |
| Prevalence of exclusive breastfeeding of children under six months of age |  | X |  |  | X |  | X |
| Prevalence of women of reproductive age consuming a diet of minimum diversity |  |  |  |  | X |  |  |
| Women’s dietary diversity: Mean number of food groups consumed by women of reproductive age |  |  | X |  |  |  |  |
| Prevalence of women of reproductive age who consume targeted nutrient-rich value chain commodities |  |  | X |  |  |  |  |
| Prevalence of children 6-23 months who consume targeted nutrient-rich value chain commodities |  |  | X |  |  |  |  |
| Prevalence of anemia among women of reproductive age |  | X |  |  |  |  |  |
| Prevalence of anemia among children 6‑59 months |  |  | X |  |  |  |  |
| Percentage of households with access to a basic sanitation service |  |  |  |  | X |  |  |
| Percentage of households with soap and water at a handwashing station commonly used by family members |  |  |  |  | X |  |  |

P1=phase one, P2=phase two, R=required, RAA=required as applicable

Appendix 2: Feed the Future Phase Two National-level Indicators

Appendix 2 Table: Global Food Security Strategy National-level Population-based Survey Performance Indicators

|  |  |
| --- | --- |
| **Results framework level** | **Indicator title** |
| **Required for all target countries** | |
| Goal | Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES) |
| Goal | Prevalence of stunted (HAZ < -2) children under five years of age |
| Goal | Prevalence of poverty: Percent of people living on less than $1.90/day 2011 PPP |
| **Context indicators** | |
| Asset-based Wealth Index | |
| Depth of poverty of the poor: Mean percent shortfall of the poor relative to the $1.90/day 2011 PPP poverty line | |
| Average income of small-scale food producers, by sex and indigenous status (SDG indicator #2.3.2) | |
| Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size (SDG indicator #2.3.1) | |
| Yield of targeted agricultural commodities [National level] | |
| Prevalence of wasted (WHZ < -2) children under five years of age [National-level] | |
| Prevalence of healthy weight (WHZ ≤ 2 and ≥-2) among children under five years of age [National-level] | |
| Prevalence of children 6-23 months receiving a minimum acceptable diet [National-level] | |
| Prevalence of exclusive breastfeeding of children under six months of age [National-level] | |
| Prevalence of underweight (BMI < 18.5) women of reproductive age [National-level] | |
| Prevalence of women of reproductive age consuming a diet of minimum diversity [National-level] | |
| Proportion of total adult rural farming population with secure tenure rights to land, with legally recognized documentation and who perceive their rights to land as secure [National-level] (rural disaggregate of SDG indicator #1.4.2) | |
| Percentage of 15-29 year olds who are Not in Education, Employment or Training (NEET) (SDG indicator #8.8.6) | |

Appendix 3: Sample Size Calculation and Formulas

**Initial Sample Size Formula**

Because all three indicators on which baseline sample size calculation is based are proportions (prevalence of hunger, stunting, poverty), the formula to calculate the initial sample size for each is:

where:

is the initial sample size required.

is the meaningful amount of change in the indicator over the six-year period.

is the estimated baseline value of the indicator.

is the estimated endline prevalence of the indicator, which equals - .

.

is the value from the Normal Probability Distribution corresponding to a confidence level . Since Posts should use (i.e., 95 percent significance level), the corresponding value is .

is the value from the Normal Probability Distribution corresponding to a power level of . Since Posts should use (i.e., 80 percent power), the corresponding value is .

is the estimated design effect of the survey (equal to 5 for hunger and poverty and 2 for stunting).

**Adjustments to Initial Sample Size**

The initial sample size should be adjusted as follows: (1) for the stunting indicator, account for households without children under five, and for households with more than one child under five; and (2) for selected households that may not be able to be interviewed (i.e., non-responding households). This is to ensure that data will be collected from enough households or individuals to reach sample requirements, even after subtracting households that cannot be reached or decline to be interviewed, and households without children under five (for stunting.)

*Adjustment for Households without Children under Five*

The following formula should be used to inflate the initial stunting indicator sample size to the number of households that would need to be contacted to reach the required sample of children under five:

where:

.

λ is the estimated average number of children under five per household in the P2-ZOI.[[25]](#footnote-25)

*e* refers to the exponential function.

The adjusted sample size () is then calculated as = x . Because no adjustment is required for the hunger and poverty indicators, = .

**Anticipated Non-response**

The sample size for each of the three goal-level indicators should then be adjusted upward to account for the estimated non-response rate. Posts can estimate non-response rates using information from the P1-ZOI baseline and interim surveys, or from poverty and demographic and health surveys conducted in the country. If non-response rates are not available, the rule of thumb, given observed non-response rates in previous ZOI population-based surveys, is to increase the adjusted sample size by 5 percent.

Appendix 4: Resources

This appendix contains a list of the ZOI Survey resources listed in this document. They are available at the following URL: <https://agrilinks.org/post/feed-future-zoi-survey-methods>.

1. Feed the Future ZOI Survey Methods Toolkit
2. Feed the Future ZOI Survey Scope of Work
3. Feed the Future ZOI Survey Core Questionnaire
4. Feed the Future Sampling Guide for Population-Based Surveys
5. Feed the Future Guide to ZOI Survey Statistics
6. Feed the Future Guide to ZOI Survey Data Treatment and Analysis Plan
7. Feed the Future ZOI Survey Data Analysis Programs (Stata)
8. Feed the Future ZOI Survey Disclosure Analysis Plan
9. Feed the Future ZOI Survey Report Template

1. https://agrilinks.org/post/feed-future-zoi-survey-methods [↑](#footnote-ref-1)
2. Bangladesh, Ethiopia, Ghana, Guatemala, Honduras, Kenya, Mali, Nepal, Niger, Nigeria, Senegal, and Uganda [↑](#footnote-ref-2)
3. https://agrilinks.org/post/feed-future-zoi-survey-methods [↑](#footnote-ref-3)
4. In addition to the LSMS-ISA+, Feed the Future is advancing the **Agricultural Integrated Survey (AGRIS)** under the Core Agricultural and Rural Data Surveys project. AGRIS is a pilot survey program begun by the Food and Agriculture Organization of the United Nations (FAO) that similarly supports national data systems through annual farm‑based surveys as a complement to household-based surveys. This survey would build on any existing farm-based surveys in country and provide the data to report on five SDG indicators. We know many Posts have been in touch with Emily Hogue, on detail to the FAO, related to this effort, and we encourage you to reach out to her ([emily.hogue@fao.org](mailto:emily.hogue@fao.org)) or Jessica Cagley ([jcagley@usaid.gov](mailto:jcagley@usaid.gov)) if you have questions. [↑](#footnote-ref-4)
5. https://agrilinks.org/post/feed-future-zoi-survey-methods [↑](#footnote-ref-5)
6. https://agrilinks.org/post/feed-future-zoi-survey-methods [↑](#footnote-ref-6)
7. Post teams that collected anemia data in the first phase of Feed the Future may choose not to do so at P1-ZOI endline, because collecting anemia data adds cost and complexity, and complicates the process of obtaining Institutional Review Board approval. If a Post team has a compelling programmatic reason to collect these data, Post teams should first look for secondary data sources such as the DHS before undertaking primary data collection. [↑](#footnote-ref-7)
8. https://agrilinks.org/post/feed-future-zoi-survey-methods [↑](#footnote-ref-8)
9. https://agrilinks.org/post/feed-future-zoi-survey-methods [↑](#footnote-ref-9)
10. https://agrilinks.org/post/feed-future-zoi-survey-methods [↑](#footnote-ref-10)
11. The Sample Design and, especially, Sample Size sections in this guidance draw extensively from Stukel, D. M. 2017. *Sampling Guide for Population-Based Surveys in Support of Feed the Future Zone of Influence Indicators*. Washington, DC: Food and Nutrition Technical Assistance Project, FHI 360 (*(forthcoming)*, which forms part of the package of technical tools and templates that support this guidance. Feed the Future population-based survey implementers should carefully review the *Sampling Guide* (available at <https://agrilinks.org/post/feed-future-zoi-survey-methods>) and follow the technical recommendations included therein as closely as possible. [↑](#footnote-ref-11)
12. Fractional interval systematic sampling involves selecting households from the EA sample frame systematically at a set sampling interval after determining a random start somewhere between 1 and the sampling interval. [↑](#footnote-ref-12)
13. Panel surveys are surveys that return in each round to interview the same set of households that were selected at baseline, rather than drawing a new sample each time. [↑](#footnote-ref-13)
14. https://agrilinks.org/post/feed-future-zoi-survey-methods [↑](#footnote-ref-14)
15. See <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>. Series (i.e., indicator) is “Poverty headcount ratio at $1.90 a day (2011 PPP) (% of population).” [↑](#footnote-ref-15)
16. Note: The FIES can be adapted and applied at the household level rather than individual adult level and with different recall periods; however, the FIES data that are currently widely available and referenced in Table 6 are collected at the individual adult level using a 12-month recall period. [↑](#footnote-ref-16)
17. See FAO. 2016. Methods for estimating comparable rates of food insecurity experienced by adults throughout the world. Rome, FAO. <http://www.fao.org/3/c-i4830e.pdf>, accessed 1/4/18. [↑](#footnote-ref-17)
18. Because using the national-level prevalence of food insecurity among adults is already a “noisy” estimate of the prevalence of food insecurity at the household level in the P2-ZOI, adding the step of projecting the national FIES value from 2014 to 2018 or 2019 before using it is not required. [↑](#footnote-ref-18)
19. [↑](#footnote-ref-19)
20. If the largest sample size calculated is too large to collect given available resources, Post teams should discuss other sample size options with their BFS MEL TA. [↑](#footnote-ref-20)
21. https://agrilinks.org/post/feed-future-zoi-survey-methods [↑](#footnote-ref-21)
22. See the Feed the Future Sampling Guide for Population-Based Surveys (<https://agrilinks.org/post/feed-future-zoi-survey-methods>) for more detail on the tradeoff between logistical and statistical efficiency when determining the appropriate number of households to sample per EA. [↑](#footnote-ref-22)
23. https://agrilinks.org/post/feed-future-zoi-survey-methods [↑](#footnote-ref-23)
24. In addition to the proprietary data formats, one version of the dataset for public use must be in a non-proprietary format such as CSV. USAID contractors should submit the data package (data, metadata, codebooks, etc.) to the Development Data Library (https://www.usaid.gov/data) within the time frame outlined in the terms of the award. [↑](#footnote-ref-24)
25. Estimates of the proportion of the population that is under five can be obtained from the World Bank Health Nutrition and Population Statistics database (http://databank.worldbank.org/data/reports.aspx?source=health-nutrition-and-population-statistics.) The series to select are ‘Female population 00-04, Male population 00-04, and ‘Population, total’. Sum the first two and divide by the third for an estimate of the proportion of the population that is under five. If survey implementers followed the Feed the Future template, former focus country P2-ZOI interim indicator assessment reports should include a table with average household size and average number of children 0-4 years per household. The latter divided by the former will yield an estimate of the proportion of children in the P1-ZOI that are under five. [↑](#footnote-ref-25)