DRAFT

Food Insecurity Experience Scale

Exploration paper: GAFSP operationalization and target setting

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This paper briefly summarizes an effort to explore the feasibility of targets for the Food Insecurity Experience Scale (FIES), situated in the broader context of low-income countries eligible for GAFSP funding. It discusses challenges in formalizing FIES targets in lower-income settings using country-level information, as well as sources of divergence arising from considerable differences across regions. The data used for this analysis was provided under the supervision of Voices of the Hungry (VOH) team at FAO. The GAFSP CU is available to explain the results presented in this report, but readers should note that the FIES data remain strictly confidential and can be released only at the discretion of the VoH team.

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ACRONYMS AND ABBREVIATIONS

CU	Coordination Unit (GAFSP)
DIME	Development Impact Evaluation
EBFIS	Experience-based food insecurity scales
FAO	Food and Agriculture Organization of the United Nations
FIES	Food Insecurity Experience Scale
GAFSP	Global Agriculture and Food Security Program
GLS	Generalized Least Squares
GNI	Gross national income
GNP	Gross national product
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association (IDA)
IRT	Item response theory
M&E	Monitoring and evaluation
PPP	Purchasing power parity
SDG	Sustainable Development Goal
VOH	Voices of the Hungry (FAO)

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INTRODUCTION

1. The newly updated Monitoring and Evaluation (M&E) Plan of the Global Agriculture and Food Security Program (GAFSP) incorporates lessons from experience with M&E for GAFSP to date and explicitly links the collection of information and reporting of results for GAFSP-supported initiatives to the implementation and accountability framework for the **Sustainable Development Goals (SDGs**). At its January 2016 meeting in Kigali, the GAFSP Steering Committee reviewed and subsequently endorsed a new set of indicators for GAFSP. The Steering Committee determined that given the program's overarching impact goals—and specifically with regard to addressing hunger and food security—the most feasible approach among the various alternatives considered was using the **Food Insecurity Experience Scale (FIES)**, a measurement tool for food insecurity developed by the Food and Agriculture Organization (FAO) of the United Nations. The FIES was selected based on the use of extensive external validation criteria, which focused principally on whether: (1) the resulting indicator is an SDG indicator and/or correlates highly with the SDG nutrition indicators (such as stunting), (2) has a relatively low cost of information collection, and (3) covers a wide range of countries.

2. Following the Steering Committee's endorsement of FIES as a GAFSP indicator, the Coordination Unit (CU) committed to explore and lay out the feasibility and potential approach to estimate an indicative GAFSP target for FIES, to be shared at the next Steering Committee meeting in early 2017. This note describes the effort to date.

FOOD INSECURITY EXPERIENCE SCALE

3. **The FIES is a tool to measure food access at the individual or household level.** It is an experience-based measure of the severity of the food insecurity condition of a household or an individual respondent (that is, the constraints on the ability to access food). A unique contribution of the experience-based food insecurity scales (EBFIS) is that they call attention to elements of deprivation in the diet that are relatively easy to detect via direct personal interviews. The FIES, as do other existing EBFIS, in particular underlines aspects of food insecurity linked to anxiety or uncertainty arising from an individual's or household's inability to procure enough food. Although the inability to access food usually results in reduced consumption of food, or in consumption of food of limited nutritional value, the FIES is not intended to provide direct measures of the quantity and quality of actual food consumption or of the nutritional status of respondents.

4. The key assumption behind the FIES is that the severity of food insecurity experienced by an individual or household can be analyzed as a "latent trait"—in other words, a trait that cannot be observed directly but whose magnitude can be inferred from observable conditions. Based on this assumption, FIES is built on a single-parameter logistic item response theory (IRT) measurement model (commonly known as the Rasch model) that provides a theoretical base and a set of statistical tools to assess the suitability of a set of survey items for scale construction.[3] Measures obtained with the FIES can be used to compute indicators of the prevalence of food insecurity in a population at any level of severity. For the purpose of monitoring

[3] FIES creates a scale from the items and compares the performance of the scale in various populations and survey contexts. The model provides the probabilistic basis for estimating the parameters associated with both items and respondents through conducting statistical tests of the strength of association of the responses to the latent trait and of the goodness of fit. The Rasch model implies that the raw score (that is, the simple sum of affirmative responses) is a sufficient statistic to estimate the respondents' severity on the scale. Maximum-likelihood methods are then used to estimate the item severity parameters and household severity parameters most consistent with the observed responses under the Rasch assumptions.

food insecurity in a consistent way throughout the world, FAO proposes the use of two different indicators: the percentage of individuals that have experienced **moderate-or-severe** food insecurity ($FI_{mod+sev}$) and the percentage of individuals that have experienced **severe** food insecurity (FI_{sev}).[4]

5. **The FIES Survey Module (FIES-SM) is composed of eight questions with simple dichotomous responses ("yes"/"no").** Questions can be framed with reference to single individuals or to all individuals living in a household, and are typically applied with a reference (recall) period of 12 months. FIES also provides an extended version of the questionnaire, with two additional follow-up questions relating to the more severe end of the scale of experiencing hunger, to extend the measured range at the severe end for use in populations where it is important to further discriminate among the severely food insecure. Given the higher prevalence of food insecurity and undernourishment in typical GAFSP-recipient countries and locations, it is anticipated that GAFSP projects will roll out the extended version of FIES for the upcoming cohort of projects.

FIES FOR DEVELOPING COUNTRIES: EXTERNAL VALIDATION

6. **One of the most important characteristics of a strong M&E system is the validity of the indicators selected.** As part of the process of selecting indicators for GAFSP, the M&E working group undertook a systematic validation exercise for the FIES. The objective of this validation effort was to test the FIES vis-à-vis globally referenced indicators of poverty and human development, and to use the results from the validation analyses to inform the GAFSP Steering Committee about the suitability of FIES as the chosen indicator of hunger/food security for the GAFSP program. The validation exercise first applied external and cross-country analyses to FIES-based prevalence rates computed by the Voices of the Hungry project team.

7. **The results presented here situate the estimated FIES-based measures in the broader context of relevant human development indicators.** FIES-based measures of food insecurity[5] have high correlations with poverty rates, under-five mortality, undernourishment, and stunting. Based on FIES data collected via the Gallup World Poll in 92 developing countries, Table 1 presents the Spearman's rank-correlation and Pearson's correlation between the two FIES-based measures—(1) the prevalence of moderate or severe food insecurity in the national adult population ($FI_{mod+sev}$) and (2) the prevalence of severe food insecurity in the adult population (FI_{sev})—and poverty and health outcomes. Table 2 shows the strength of the relationship between FIES-based indicators and under-five mortality rate after controlling for extreme poverty, which is positive and significant – estimated for a sample of 69 countries, for which complete datasets are available for both dependent and independent variables. Scatter plots (Figure 1 and Figure 2) depict the strength of these correlations. This exercise helped to lay the groundwork for further thinking about potential target setting for FIES at the program level.

[4] A third indicator, the percentage of individuals experiencing moderate levels only (FImod), can be computed as the difference between FImod+sev and FIsev. FAO advises against reporting on this third indicator because reductions in FImod may be due to either a reduction of overall food insecurity (if some of those who used to experience moderate levels of food insecurity improve their condition) or to a worsening situation (when some of them move to severe levels).

[5] The validation is done through publicly available data for FIES-based indicators as of 2014.

Table 1: Spearman and Pearson Correlation Coefficients between FIES-based measures and other measures of food insecurity/poverty

Measures of food insecurity/poverty	Spearman Correlation		Pearson Correlation	
	FImod+sev	FIsev	FImod+sev	FIsev
New Poverty Line US$1.90	0.7134*	0.6969*	0.6345*	0.6008*
Rural Poverty Headcount Ratio (at US$1.25 PPP a day)	0.5953*	0.5391*	0.6178*	0.5398*
Under 5 mortality rate	0.6999*	0.6751*	0.6336*	0.5678*
Underweight	0.5211*	0.5193*	0.4022*	0.3014*
Stunting	0.6157*	0.5870*	0.6057*	0.5054*
Undernourishment	0.6344*	0.5934*	0.5076*	0.5141*

Source: Publicly available FIES data as of 2014.
Note: * denotes correlation coefficients significant at the 5% level or lower.

Table 2: Regression analysis of food security and poverty indicators on child mortality rates

	Model 1	Model 2
Coefficients are adjusted for robust standard error		
Log (FIES Moderate+Severe)	0.268** (2.47)	–
Log (FIES Severe)	–	.171** (2.1)
Log (Adjusted Poverty Headcount)	0.271** (6.94)	.269** (6.58)
Adjusted R-Square	0.7189	0.7183
Number of Observations	69	69

Source: GAFSP Coordination Unit and FAO Voices of the Hungry.
Note: Significance of coefficients is denoted as follows: * p<0.05, ** p<0.01.

Figure 1: FIES (Mod+Sev) Capturing Under 5 Mortality Rate

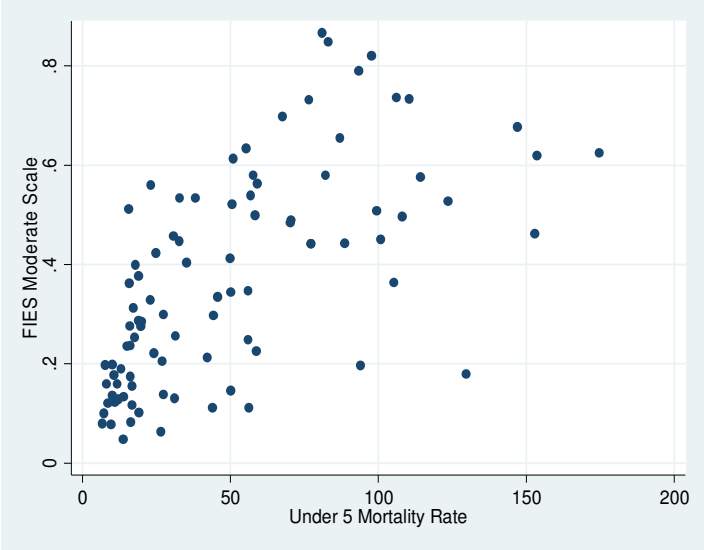
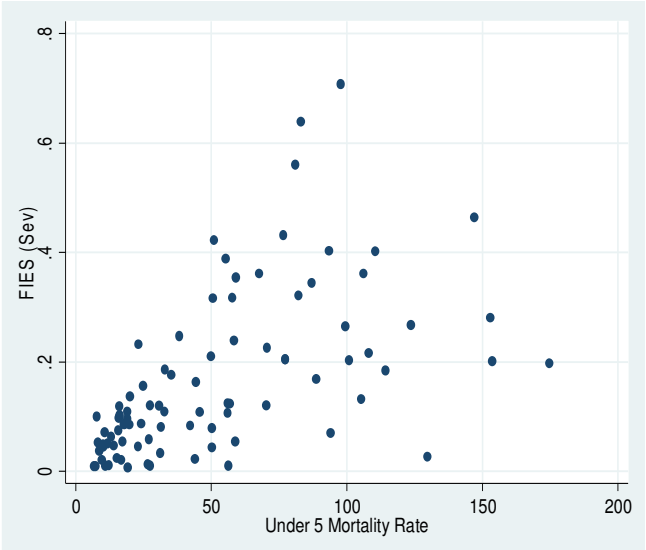


Figure 2: FIES (Sev) Capturing Under 5 Mortality Rate



Source: GAFSP Coordination Unit and FAO Voices of the Hungry. The left-hand chart plots FIES moderate or severe scale vis-à-vis under 5 mortality rate and the right hand chart plots FIES severe scale vis-à-vis under 5 mortality rate.

FIES FOR GAFSP: TARGET SETTING

8. **Going forward under GAFSP, all new Public Sector Window projects and a sample of Private Sector Window projects are expected to use the FIES in order to track changes in food insecurity among GAFSP beneficiaries.** Given this new M&E policy, it is reasonable for GAFSP to consider what might be an appropriate target percentage change for FI_{sev} to which GAFSP could be expected to contribute.

9. Targets can be estimated based on *ex-ante* and *ex-post* approaches. Ex-ante targets typically use structural models or simulations to determine the likely anticipated gains (or not) for an indicator. This paper attempts to predict the change in prevalence of severe food insecurity under GAFSP in response to income changes, based on an ex-ante approach—and with notable limitations, as outlined below.

10. A considerable challenge in estimating such a target is that FIES-based measures are only available for two years of data at a national level, and for relatively small sample sizes that cannot be further disaggregated. Given the limitation in time series data, there is no way to derive a robust assessment of the magnitude of past annual changes to be used as indicative of the magnitude of future changes as the basis for a GAFSP aspirational goal/target. In consultation with the FAO Voices of the Hungry (VOH) team (VOH is the custodian of the FIES), the GAFSP M&E team has been exploring potential options for deriving a program-wide FIES-based target. Within the considerable limitations noted, the use of different types of data (both micro- and macro-level data) and statistically grounded methodologies, consistent with country-specific contexts, have been discussed and are presented here.

Objective and Methodology

11. **With the limitations of the FIES data that are currently available,** an elasticity-based methodology is proposed to derive an indicative change in the prevalence of food insecurity as measured by FIES for the GAFSP pool of beneficiaries, in response to a certain percentage gain in income. **The goal of this exercise is therefore to estimate the change in prevalence of food insecurity, as measured by FIES,[6] that is implied if GAFSP reaches its poverty reduction target** (Box 1).

> **Box 1: The GAFSP income gain target**
>
> With an additional US$1.5 billion in GAFSP financing, and within 5 years from the start of implementing associated projects, GAFSP aims to raise incomes of 10 million poor people in rural households by 20 percent in countries furthest from achieving the SDGs (as per the paper presented at the GAFSP Steering Committee Meeting in January 2016).

12. The method proposed here is to derive income elasticities of food access, using national-level FIES-based prevalence rates and standardized income. In the absence of time-consistent household level income data across all GAFSP-eligible countries, national level GNI-per capita (both Atlas method and PPP based)[7] and

[6] Moderate-or-severe food insecurity ($FI_{mod+sev}$) or severe food insecurity (FI_{sev}).

[7] In calculating gross national income (GNI) in U.S. dollars for certain operational and analytical purposes, the World Bank uses the Atlas conversion factor instead of simple exchange rates. The purpose of the Atlas conversion factor is to reduce the impact of exchange rate fluctuations in the cross-country comparison of national incomes. All models were also tested using GNI per capita, PPP (constant 2011

national-level FIES-based prevalence rates were used in the analysis. Using the Atlas method, data for 29 GAFSP-eligible countries for which two years (2014 and 2015) of FIES and GNI per capita data are available were included (out of 56 total GAFSP-eligible countries listed in Annex 2), whereas with GNI per capita PPP, the number of countries was reduced further due to unavailability of data for five GAFSP-eligible countries.

13. **Panel regression analyses suggest that for GAFSP-eligible countries, the prevalence of severe food insecurity (FIsev) is more responsive to changes in income (in other words, income elasticities are greater) as compared to moderate-or-severe food insecurity.** Two types of models were tested[8]. A simple Generalized Least Squares (GLS) model is tested and preferred under the assumption that the unobserved variables are uncorrelated with (or, more strongly, statistically independent of) all the observed variables. The model is repeated under four scenarios using panel and pooled data. An extensive sensitivity analysis is also carried out, given the small size of the sample. Following Buddelmeyer et al. (2008), multiple methods are tested to counter acute fixed effect biases arising from the small sample size.

14. **In all cases, elasticity estimates are derived by regressing the log change in prevalence of food insecurity on the predicted log change in income.** To capture the influence of time period specific effects, an alternative model is also estimated including year dummies[9] under each scenario (see the discussion in the Results section). With only two years of data available, the addition of the time dummy had no significant influence on the estimated elasticities.

Results

15. **For GAFSP countries, the change in the prevalence of food insecurity in response to income, measured by GNI per capita, is estimated to be statistically significant (given p-values less than 0.05)** (Table 3.1). The estimated negative values of the estimated elasticities broadly support the theory that higher income is associated with a lower prevalence of food insecurity. In simple terms, the estimates from the first model suggest that for every 10 percent increase in GNI per capita, the prevalence of moderate-to-severe food insecurity might decline by 4.6 percent, while severe food insecurity might decline by almost 7 percent.

Table 3.1: Prevalence of Food Insecurity in Response to Change in Income (GNI per capita, Atlas method)

	βFImod+sev^ (p-value in parentheses)	βFIsev^ (p-value in parentheses)
Income elasticity using panel regression	–.46 (0.006)	–.69 (0.016)
Income elasticity using panel regression with year dummy	–.42 (0.013)	–.62 (0.027)
Income elasticity using pooled regression	–.42 (0.001)	–.60 (0.006)
Income elasticity using pooled regression with year dummy	–.42 (0.002)	–.60 (0.007)
Number of observations = 58		

Source: GAFSP Coordination Unit and FAO Voices of the Hungry.

international $). GNI PPP is gross national income (GNI) converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GNI as a U.S. dollar has in the United States. GNI is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad. Data are in constant 2011 international dollars.

[8] Alternative methods (for example, linear regression with panel-corrected standard errors) were also tested and yield statistically significant results, resulting in similar estimates of elasticities.

[9] The rationale for adding time-period specific effects is that it controls for all spatial-invariant variables whose omission could bias estimates in a typical time-series study.

Note: Robust standard errors used (to control for heteroskedasticity). P-values lower than 0.05 show a statistically significant relationship.

Table 4.2: Prevalence of Food Insecurity in Response to Change in Income (GNI per capita, PPP (constant 2011 international $)

	βFImod+sev^ (p-value in parentheses)	βFIsev^ (p-value in parentheses)
Income elasticity using panel regression	–.50 (0.002)	–.84 (0.005)
Income elasticity using panel regression with year dummy	–.50 (0.002)	–.87 (0.004)
Income elasticity using pooled regression	–.52 (0.001)	–.88 (0.001)
Income elasticity using pooled regression with year dummy	–.53 (0.001)	–.88(0.001)
Number of observations = 58		

Source: GAFSP Coordination Unit and FAO Voices of the Hungry.
Note: Robust standard errors used (to control for heteroskedasticity). P-values lower than 0.05 show statistically significant relationship.

16. After controlling for temporal variation in the dependent variable (year dummy), **a 10 percent income increase (measured by GNI per capita, Atlas method) is estimated to reduce the prevalence of moderate-to-severe food insecurity by 4.2 percent, while the prevalence of severe food insecurity is estimated to decline by 6.2 percent.** The pooled regression also yields results of similar strength and in the same direction.

17. **The elasticities were estimated to be much higher with GNI per capita PPP (Table 3.2).** The analysis showed a 10 percent income increase can reduce the prevalence of moderate or severe food insecurity by 5%, while the prevalence of severe food insecurity is estimated to decline by 8.4%. After controlling for temporal variation in the dependent variable (year dummy), a 10 percent income increase (measured by GNI per capita, PPP) is estimated to reduce the prevalence of moderate-to-severe food insecurity by 5.2 percent, while the prevalence of severe food insecurity is estimated to decline by 8.7 percent. In this case as well, the pooled regression also yields results of similar strength and in the same direction.

18. These elasticity estimates can then be used to inform and set a target for FIES that is consistent with the GAFSP 20 percent income gain target (Box 1). For example a 20 percent income gain would imply a 17% reduction in the share of people experiencing severe food insecurity (Income gain * elasticity = 20 * 0.87 = 17.4%), i.e. a corresponding target to reduce the share of households experiencing severe food insecurity by 17% within 5 years from the start of implementing associated projects. A big assumption, based on data availability, is that the initial average share of households experiencing severe food insecurity at national level, as reflected by the 2014 FIES data, and the depth of food insecurity, are similar to average shares and the depth of food insecurity among the target beneficiaries of GAFSP projects. Arguably, the shares of food insecure households among GAFSP projects would likely be higher given the profile of target beneficiaries, however, there is currently no way to check without household level data of project beneficiaries.

Challenges and caveats

19. **National-level data covering smaller time periods can present a number of important analytical challenges.** One of the most notable challenges is that only two years of FIES data are available. Given these data limitations, the variation across countries drives more of the elasticity estimates than the

variation over time. The smaller time series effects limit the robustness of the approach to derive targets for FIES-based indicators. Controlling for the effects of unique country characteristics to isolate the impact of income difference on food insecurity is also a challenge.

20. **There is also no way to validate national level results with household level estimates.** The Gallup World Poll survey results used by VoH are based on around 1,000 interviews per country, and are designed to be representative of the national population. Although adjustments are made to reflect the respective shares of urban and rural populations, for many countries the samples drawn from rural areas may be too small to be representative of the rural-based beneficiaries targeted by GAFSP. There is no way currently to assess the extent of these differences, and the associated robustness of using the elasticities derived from national level results as indicative of those for potential GAFSP beneficiaries. Although the GAFSP M&E team, through its partnership with the VOH team, has access to micro-level data used to estimate FIES prevalence rates, additional micro-level data for demographic variables (gender, age), employment status, geographic variables (rural/urban), and income corresponding to the same individual/households would need to be accessed in order to carry out additional ex-ante analysis at the household level.

Recommendation to the SC

21. Such an analysis, using an additional year's worth of data, would provide *a better informed FIES target recommendation for GAFSP and is the approach recommended by the CU to the SC*. The VOH team is expected to provide age, gender, education, and urban/rural and marital status data to the CU. To access the micro-level income data needed to complement the FIES data and enable further analysis, the CU would need to obtain a license from Gallup for its data-sets for GAFSP-eligible countries for 2014, 2015, and 2016. The CU is in initial discussions with Gallup through the VOH team and will use funds from within the planned M&E budget for FY17/18 to cover costs, as part of GAFSP's operationalization of the updated GAFSP indicators. Members of the M&E Working group will be informed of progress regularly, with the CU coming back to the SC with updated recommendations on targets by the end of CY 2017, data availability permitting.

ANNEX 1: SELECTED REGRESSION MODELS USING MACRO DATA

```
. xi: xtreg LnFIsev LogGNIpercapita, re r

Random-effects GLS regression                   Number of obs      =        58
Group variable: country1                        Number of groups   =        29


                                                Wald chi2(1)       =      5.77
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0163

                                 (Std. Err. adjusted for 29 clusters in country1)
------------------------------------------------------------------------------
             |               Robust
      LnFIsev |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
LogGNIpercapita |   -.693773   .2889366    -2.40   0.016    -1.260078   -.1274676
       _cons |    7.48339   1.891128     3.96   0.000     3.776847    11.18993
-------------+----------------------------------------------------------------
      sigma_u |  .89107274
      sigma_e |  .24444895
          rho |  .93000975   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xi: xtreg LnFImodsev LogGNIpercapita, re r

Random-effects GLS regression                   Number of obs      =        58
Group variable: country1                        Number of groups   =        29


                                                Wald chi2(1)       =      7.48
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0062

                                 (Std. Err. adjusted for 29 clusters in country1)
------------------------------------------------------------------------------
             |               Robust
   LnFImodsev |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
LogGNIpercapita |  -.4647257   .1698949    -2.74   0.006    -.7977137   -.1317377
       _cons |   6.934508    1.08843     6.37   0.000     4.801223    9.067793
-------------+----------------------------------------------------------------
      sigma_u |  .48260635
      sigma_e |  .14931523
          rho |  .91263835   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xi: xtreg LnFImodsev LogGNIpercapita, re r

Random-effects GLS regression                   Number of obs      =        50
Group variable: country1                        Number of groups   =        25


                                                Wald chi2(1)       =      9.15
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0025

                                (Std. Err. adjusted for 25 clusters in country1)
------------------------------------------------------------------------------
             |               Robust
    LnFImodsev |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
LogGNIpercapita |  -.5006156   .1654642    -3.03   0.002    -.8249194   -.1763118
          _cons |   7.646186   1.210592     6.32   0.000      5.27347    10.0189
-------------+----------------------------------------------------------------
       sigma_u |  .39170297
       sigma_e |  .16439915
           rho |  .85023088   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xi: xtreg LnFIsev LogGNIpercapita, re r

Random-effects GLS regression                   Number of obs      =        50
Group variable: country1                        Number of groups   =        25


                                                Wald chi2(1)       =      7.79
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0053

                                (Std. Err. adjusted for 25 clusters in country1)
------------------------------------------------------------------------------
             |               Robust
       LnFIsev |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
LogGNIpercapita |  -.8477126   .3038154    -2.79   0.005     -1.44318   -.2522454
          _cons |   9.288504   2.257139     4.12   0.000     4.864594    13.71241
-------------+----------------------------------------------------------------
       sigma_u |  .80206374
       sigma_e |  .25835915
           rho |  .90599406   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

ANNEX 2: COUNTRIES ELIGIBLE FOR GAFSP FUNDING

The call for proposals will be open to all members of the International Development Association (IDA) that are eligible to receive financing from IDA and not the International Bank for Reconstruction and Development (IBRD) ("IDA-only countries") and that are not in non-accrual status.[10] This currently includes the 56 countries list in Table A2.1.

Table A2.1: Countries eligible for GAFSP funding, by region

Africa *(32 countries)*		**East Asia and the Pacific** *(11 countries)*	**Europe and Central Asia** *(3 countries)*	**Latin America and the Caribbean** *(4 countries)*	**Middle East and North Africa** *(1 country)*	**South Asia** *(5 countries)*
Benin Burkina Faso Burundi CAR Chad Comoros Côte d'Ivoire Djibouti Democratic Republic of Congo Ethiopia Gambia Ghana Guinea Guinea-Bissau Kenya Lesotho Liberia	Madagascar Malawi Mali Mauritania Mozambique Niger Rwanda São Tomé and Principe Senegal Sierra Leone South Sudan Tanzania Togo Uganda Zambia	Cambodia Kiribati Lao PDR Marshall Islands Micronesia, FS Myanmar Samoa Solomon Islands Tonga Tuvalu Vanuatu	Kosovo Kyrgyz Republic Tajikistan	Guyana Haiti Honduras Nicaragua	Yemen	Afghanistan Bangladesh Bhutan Maldives Nepal

[10] Nonaccrual status occurs when the oldest payment arrears are six months overdue. Once all arrears are cleared, all loans to, or guaranteed by, the country are generally restored to accrual status.

ANNEX 3: VARIABLES NEEDED FOR ADDITIONAL ANALYSIS

Table A3.1: Definitions and data sources for micro-level variables needed for additional analysis

Indicator	Definition	Data-source
Food Insecurity: Moderate-to-severe or Severe	The Food Insecurity Experience Scale (FIES) is a measure of food access at the individual or household level. It is a member of the family of experience-based food security measurement scales and measures the severity of the food insecurity condition of a household or an individual respondent (constraints on the ability to access food).	VOH
Income	Annual Household Income in Local Currency; Per Capita Income Quintiles. Propose using dummy that takes the value 1 if the respondent falls in the poorest 40% income group and 0 otherwise.	Gallup
Household Size	Total Number of People Living in Household. Also, propose using squared household size.	Gallup
Women	Dummy that takes the value 1 if the respondent is female and 0 otherwise.	Gallup
Age: 15 years and above	Age in years.	Gallup
Age squared	Age in years, squared.	GAFSP
Marital Status:	Dummy variable that takes the value 1 if the respondent is single and 0 otherwise.	Gallup
Education Status: elementary education	Dummy that takes the value 1 if the respondent completed elementary education or less (up to 8 years of education) and 0 otherwise.	Gallup
Education Status: secondary education	Dummy that takes the value 1 if the respondent completed secondary education and some education beyond secondary education) and 0 otherwise.	Gallup
Education Status: tertiary education	Dummy that takes the value 1 if the respondent completed tertiary education and some education beyond tertiary education) and 0 otherwise.	Gallup
Employment Status	Dummy that takes the value 1 if the respondent is employed, either full or part time, and 0 otherwise.	Gallup
Geography	Dummy that takes the value 1 if the respondent lives in a rural area and 0 otherwise. According to the World Bank, "rural population" refers to people living in rural areas as defined by national statistical offices. It is calculated as the difference between total population and urban population.	Gallup

Source: This list was prepared from the following sources: Cafiero, C. (2013), "The Food Insecurity Experience Scale: Development of a Global Standard for Monitoring Hunger Worldwide"; Gallup (2016), "World-Wide Research and Methodological Code-Book"; Horton, S., and J. Hoddinot (2015), "Post-2015 Consensus: Food Security and Nutrition Perspective"; Klapper et al. (2016), "Achieving the Sustainable Development Goals: The Role of Financial Inclusion"; and Moltedo et al. (2014), "Analyzing Food Security Using Household Survey Data."