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Integrated Natural Resource Management (INRM)

HEARTH Monitoring and Evaluation Toolkit: *Resilience*

APRIL 2022

Integrated Natural Resource Management (INRM)

Sound management of natural resources is central to long-term development and resilience. Faced with an urgent need to reduce environmental degradation while improving human well-being, solutions that effectively integrate investments in natural resource management with economic and social development are increasingly urgent. INRM promotes integrated programming across environment and non-environment sectors and across the Program Cycle. INRM supports USAID to amplify program impacts, strengthen gender equality and social inclusion, and identify best practices for integration.

For more information:

<https://land-links.org/project/integrated-natural-resource-management-inrm-activity/>

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Front Cover photo:	Draught oxen in the Mashi Wildlife Conservancy (Zambezi Region, Namibia) pull a wooden sled. Sensible, sustainable land-use planning that includes wildlife- and livestock-based activities increase opportunities for resilience among rural communities in southern Africa. Photo By Mark W Atkinson / WCS AHEAD.

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Acronyms

ARSSI	Ability to Recover from Shocks and Stresses Index
ATR	Ability to Recover
CWI	Comparative Wealth Index
DHS	Demographic and Health Surveys
FIES	Food Insecurity Experience Scale
FTF	Feed the Future
HEARTH	Health, Ecosystems, and Agriculture for Resilient Thriving Societies
INRM	Integrated Natural Resource Management
IP	Implementing Partner
LSMS	Living Standards Measurement Studies
MERL	Monitoring, Evaluation, Research, and Learning
SEI	Shock Exposure Index
STARR	Strengthening Tenure and Resource Rights II
USAID	United States Agency for International Development
USG	United States Government
ZOI	Zone of Influence

Overview

Together, Health, Ecosystems, and Agriculture for Resilient Thriving Societies (HEARTH) and INRM have created the HEARTH Monitoring and Evaluation Toolkit, a suite of indicators and guidance that will help United States Agency for International Development (USAID) Missions and implementing partners (IPs) monitor progress and aggregate common metrics to build the evidence base around the effectiveness of integrated strategic approaches. This document is an individual module from the toolkit, presented separately to facilitate use by individual HEARTH activities. Before using this module, we recommend first accessing the full toolkit and reviewing the list of sectors covered by each module, and determining which are most relevant for your activity:

[Access Full Toolkit on Biodiversity Links Here.](#)

How To Use This Toolkit

This toolkit presents a **menu of options** for outcomes and recommended indicators across the HEARTH activities. Before using this toolkit, activities should have developed a robust theory of change – through first drafting their situation model and results chains during the co-design workshops, many of which have been completed already, and then validating and refining those results chains during start-up workshops.

Based on the activity theory of change, HEARTHS should develop their Activity Monitoring, Evaluation, Research, and Learning (MERL) Plan, which should draw directly from the toolkit. It is not expected that all outcomes or indicators will be relevant for all activities, but that activities should select those in line with their results chains and activity theory of change. Additionally, there might be activity-specific outcomes not included in this toolkit because they were not generally applicable across the HEARTH portfolio, and Missions and IPs should therefore include additional indicators in their MERL plans, as relevant.

When developing activity MERL plans, the indicators in this toolkit are intended to be used both to **standardize reporting for monitoring data, as well as a basis for evaluation data collection**. While monitoring trends in these indicators over time may be important for some activities, USAID anticipates that Missions and IPs will also identify important questions about the causal impact of their activities during the start-up activities, best answered using evaluation approaches. Which indicators will be part of monitoring systems, and which will be used to answer evaluation questions, will affect how the toolkit is operationalized. In addition, it is expected that MERL plans will likely include **qualitative data sources**, important to further explaining monitoring and evaluation results and exploring learning questions in more depth, in addition to the quantitative data collected using the approaches from the toolkit.



Indicator Guidance and Core Household Questionnaire

This document contains guidance for defining and collecting data for each of the recommended indicators for Missions and IPs, including Performance Indicator Reference Sheets throughout. This guidance draws heavily on established best practices, such as the Demographic and Health Surveys (DHS) and Feed the Future programs. In addition to this guidance, INRM developed a core questionnaire to provide a basis for household surveys to facilitate ease of take-up. It should be emphasized that it is important for Missions and IPs to adapt the questionnaire to their local country context – which might include adding/removing answer choice options, updating question text or translations, etc. Areas where edits for local context are typically required are identified in the tool and following guidance. The full toolkit includes additional guidance on respondent identification and inclusion of household rosters, as well as more in-depth discussions on sampling approaches, data collection administration and frequency, data management, privacy, and ethics, which should be considered.

Outcomes and Indicators for Resilience

Table 1: Overview of Outcomes and Recommended Indicators for the Resilience Sector.

Outcomes	HEARTH Portfolio Indicators
Increased household resilience	<ul style="list-style-type: none">• Average score on the ability to recover from shocks and stresses index (ARSSI)
Use of natural resources to reduce effects of shocks and stresses	<ul style="list-style-type: none">• Average score measuring the extent that households rely on natural resources during times of stress
Increased use of renewable and clean energy sources	<ul style="list-style-type: none">• Percent of households using renewable fuel sources or grid-connected electricity

Resilience

Pathways To Change

HEARTH activities might increase household resilience to shocks and stresses through several different pathways, including increased incomes/socio-economic well-being, increased access to finance, increased social capital/networks, and potentially increased use/availability of natural resources. Resilience is also a function of exposure to risk, access to resilience capacities, and resulting change in well-being, measured by indicators from other modules such as the Food Insecurity Experience Scale (FIES) and Comparative Wealth Index (CWI). Shocks and stresses might include climate and/or weather-related events such as too much or little rain, as well as the COVID-19 pandemic, conflicts, and economic shocks. Increased biophysical health of ecosystems might increase the availability of natural resources, thus providing greater opportunities for households to rely on them in times of stress. However, greater conservation knowledge/awareness might also lead households to shift to other coping mechanisms during these times, so the overall impact on use of natural resources might be higher or lower depending on the local context and HEARTH activity theory of change. Additionally, several HEARTHs include direct activities to promote changes to renewable/clean energy away from diesel or other fuel sources, thus reducing GhG emissions and therefore reducing the impact on climate.

Recommended Outcomes and Indicators

Outcome	Description	Recommended Indicator & Duration
Increased household resilience	The ARSSI captures information on both the severity of different types of shocks as well as households’ ability to recover. ARSSI acts as a proxy for actual recovery and is associated with positive coping behaviors in the face of shocks and stresses, which indicates that a household is resilient to shock and stresses and thus is in a much better position to recover from them. ^{1, 2}	<p>Indicator: Average score on the ARSSI</p> <p>Source: Feed The Future (FTF) Indicator RESIL-a [Zone of Influence (ZOI)-level] Ability to recover from</p>

¹ Jones, Lindsey, and Thomas Tanner. “‘Subjective Resilience’: Using Perceptions to Quantify Household Resilience to Climate Extremes and Disasters.” *Regional Environmental Change* 17, no. 1 (2016): 229–43. <https://doi.org/10.1007/s10113-016-0995-2>.

² Consta, Maxwell D, M Frankenberger, T Klaus, and M Mock. “Qualitative Data and Subjective Indicators for Resilience Measurement.” Resilience Measurement Technical Working Group. Technical Series No. 4. Food Security Information Network, 2015. https://www.fsnnetwork.org/sites/default/files/1_FSIN_TechnicalSeries_4.pdf.

Outcome	Description	Recommended Indicator & Duration
		shocks and stresses index ³ Duration: 10 minutes
Use of natural resources to reduce effects of shocks and stresses	<p>Households are expected to rely on natural resources and wild products to reduce the effects of shocks and stress. These questions will measure the overall level of reliance on natural resources and wild products for food or income during normal times and during times of stress, on a scale from 1-10. This approach will NOT measure the extent of reliance on <i>unsustainable use</i> of natural resources, so the desirable direction of change will depend on the local context.</p> <p>If HEARTH activities are interested in a more nuanced understanding of the reliance on specific types of activities or resources (e.g., hunting, gathering wild fruits/vegetables, etc.) during times of stress, these questions could be modified accordingly.⁴</p>	Indicator: Average score measuring the extent that households rely on natural resources during times of stress Source: N/A Duration: 2 minutes
Increased use of renewable and clean energy sources	<p>Use of fuel sources can be measured using questions adapted from the Living Standards Measurement Studies (LSMS) Fuel Sources Module related to fuel type, amounts, and source (purchased vs. collected). First, each household will be asked if they used a given fuel source in the past 30 days, and then if yes, a set of 5 follow-up questions would be asked regarding the amount and source(s).</p> <p>If energy is a key outcome for a given HEARTH activity, supplemental questions from the LSMS module may be added including price paid per unit/total cost, time and distance spent collecting (disaggregated by men and women), and % used for different purposes (lighting, cooking, heating, etc.). However, for most HEARTH</p>	Indicator: Percent of households using renewable fuel sources or grid-connected electricity Source: LSMS Fuel Sources Module ⁵ Duration: 2-7 minutes (depending on the number of fuel sources used by the household)

³ Feed the Future. “Feed the Future Indicator Handbook.” US Government’s Global Hunger and Food Security Initiative, September 2019. https://fr.fsnnetwork.org/sites/default/files/ftf_agriculture_guide_0.pdf.

⁴ For example, instead of asking “to what extent does your household rely on wild products” activities could modify this to ask, “to what extent does your household rely on hunting”, etc.

⁵ O’Sullivan, Kyran, and Douglas F. Barnes. “Energy Policies and Multitopic Household Surveys.” World Bank Working Papers, 2006. <https://doi.org/10.1596/978-0-8213-6878-7>.

Outcome	Description	Recommended Indicator & Duration
	<p>activities it is expected that this level of detail will not be necessary.</p> <p>While grid connected electricity might not be from renewable sources, it is included in this indicator, as the primary intent is to measure increasing use of sources other than locally non-renewable sources.</p>	

Performance Indicator Reference Sheets

INDICATOR TITLE: Average score on the ARSSI

DEFINITION:

The Ability to Recover from Shocks and Stresses Index is based on estimation of the ability of households to recover from the typical types of shocks and stressors that occur in the program areas, such as loss of a family member, loss of income, hunger, drought, flood, conflict or similar events, based on data regarding recovery from the shocks and stressors households experienced in the year prior to the survey and their perceived ability to meet food needs the following year.

The base “ability to recover” index is calculated based on the responses to two questions after the respondent is asked about his/her household exposure to and the severity of a series of 16 types of shocks and stressors that might have occurred during the previous year:

1. Would you say that right now, your household's ability to meet your food needs is:

- Better than before these difficult times? (Assigned a value of 3)
- The same as before these difficult times? (Assigned a value of 2)
- Or worse than before these difficult times? (Assigned a value of 1)

AND

2. Looking ahead over the next year, do you believe your household's ability to meet your food needs will be:

- Better than before these difficult times? (Assigned a value of 3)
- The same as before these difficult time s? (Assigned a value of 2)
- Or worse than before these difficult times? (Assigned a value of 1)

The responses to the two questions are combined (additive) into one variable that has a minimum value of 2 and a maximum value of 6.

The 16 shocks and stresses are: too much rain, too little rain, erosion of land, loss of land, sharp increase in the price of food, someone stealing or destroying belongings, not being able to access inputs for crops, disease affecting crops, pests affecting crops, theft of crops, not being able to access inputs for livestock, disease affecting livestock, someone stealing animals, not being able to sell crops, livestock or other products at a fair price, severe illness in the family, death in the household.

Since each survey household did not experience the same types of shocks/stressors of the same severity, it is necessary to create a “shock exposure corrected” index to measure ability to recover.

INDICATOR TITLE: Average score on the ARSSI

A measure of shock/stressor exposure and severity is created that takes into account the shocks or stressors to which a household is exposed out of the total number of shocks or stressors, and the perceived severity of the shock on household income and food consumption.

Perceived severity is measured using two variables: impact on income security and impact on food consumption. The variables are based on respondents' answers to the questions, "How severe was the impact on your household economic situation?" and "How severe was the impact on household food consumption?" which are asked of each shock or stressor experienced. The possible responses are:

- Not severe (assigned a value of 1)
- Somewhat Severe (assigned a value of 2)
- Severe (assigned a value of 3)
- Extremely Severe (assigned a value of 4)

The responses to the two questions are combined into one severity variable that has a minimum value of 2 and a maximum value of 8 for each shock and stressor.

The Shock Exposure Index (SEI) is then a weighted sum of the incidence of experience of each shock (a variable equal to one if the shock or stressor was experienced and zero otherwise), weighted by the perceived severity of the shock. The SEI ranges from 0 to 128 (if all 16 shocks/stressors were experienced by the households at the highest level of severity).

Finally, the shock exposure corrected ARSSI is calculated to create a measure of ability to recover that corrects for any differences between households in their shock exposure and is therefore comparable across them. To do so, a linear regression of the base ability-to-recover (ATR) index on the SEI is run, yielding the amount by which an increase of 1 in the shock exposure index can be expected to change the ability to recover index.

The estimated empirical equation is:

$$ATR = a + b * SEI$$

The coefficient on SEI, the "b", is expected to be a negative number such that the higher is shock exposure, the lower is the ability to recover.

The coefficient 'b' is then used to calculate the adjusted ARSSI for each household using the following equation:

$$ARSSI = ATR + b * (Y - SEI)$$

INDICATOR TITLE: Average score on the ARSSI

where Y is the mean across households of the SEI. As such, the ATR index value of a household with shock exposure below the mean would have a downward adjustment of its value and the opposite for a household with shock exposure above the mean.

ADAPTATION:

The list of 16 shocks and stresses should be reviewed and adapted to the local context as relevant for each HEARTH activity. This includes removing shocks and stresses that are not relevant, adding shocks and stresses that might be relevant but not already included in the list, and/or adapting the language for the current shocks and stresses to be more specific to the local context.

UNIT:

Score ranging from 2-6

DISAGGREGATE BY:

N/A

TYPE:

Outcome

DIRECTION OF CHANGE:

Higher is better

MEASUREMENT NOTES**INTENDED RESPONDENT:**

Primary household decision-maker (male or female) from sample households. If this person is not available, another adult from the household may be used for reporting.

REPORTING NOTES

In addition to reporting the average score, the number of participant households of the resilience-sensitive activity must be reported, to allow a weighted average to be calculated across HEARTH activities for reporting. Additionally, activities should report on the total sample size (including any disaggregation for participant households vs. comparison/control households if an evaluation is being conducted). Finally, activities should also report on the standard deviation.

INDICATOR TITLE: Average score measuring the extent that households rely on natural resources during times of stress

DEFINITION:

A set of two questions will measure the overall level of reliance on natural resources and wild products for food or income during (1) normal times and (2) during times of stress, on a scale from 1-10. Wild products include wild fish and bushmeat, as well as wild fruits/vegetables and other products that might be foraged. The definition of natural resources from the forest excludes agroforestry, defined as the integration of trees and shrubs into agriculture, including trees on farms and in agricultural landscapes, farming in forests and along forest margins, and tree-crop production.⁶

Questions are asked over a recall period of 12 months to capture average reliance across all seasons, which will facilitate comparisons across HEARTHs (regardless of what season surveys take place in).

An additional question for households who do not rely heavily (i.e., who answer 1 - 4) on natural resources and/or wild products during difficult times or times of stress will gather explanatory information on why households do not rely on these resources/products, including the availability and accessibility of resources/products.

ADAPTATION:

If HEARTH activities are interested in a more nuanced understanding of the reliance on specific types of activities or resources (e.g., hunting, gathering wild fruits/vegetables, etc.) during times of stress, these questions could be modified accordingly. For example, instead of asking “to what extent does your household rely on natural resources and/or wild products” activities could modify this to ask, “to what extent does your household rely on hunting,” etc.

Additionally, answer choices for why households might not rely heavily on natural resources and/or wild products should be adapted for the local context as appropriate.

<p>UNIT:</p> <p>Score ranging from 1- 10</p>	<p>DISAGGREGATE BY:</p> <p>N/A</p>
<p>TYPE:</p> <p>Outcome</p>	<p>DIRECTION OF CHANGE:</p> <p>Higher or lower might be better depending on the local context and activity theory of change. This is because this indicator alone</p>

⁶ Definition adapted from ICRAF: “What Is Agroforestry?” World Agroforestry | Transforming Lives and Landscapes with Trees. ICRAF, n.d. <https://www.worldagroforestry.org/about/agroforestry>.

INDICATOR TITLE: Average score measuring the extent that households rely on natural resources during times of stress

	does not measure the extent to which the reliance on natural resources/wild products is unsustainable.
MEASUREMENT NOTES	
INTENDED RESPONDENT:	Primary household decision-maker (male or female) from sample households. If this person is not available, another adult from the household may be used for reporting.
REPORTING NOTES	
In addition to reporting the average score, the number of participant households of the resilience-sensitive activity must be reported, to allow a weighted average to be calculated across HEARTH activities for reporting. Additionally, activities should report on the total sample size (including any disaggregation for participant households vs. comparison/control households if an evaluation is being conducted). Finally, activities should also report on the standard deviation.	

INDICATOR TITLE: Percent of households using renewable fuel sources or grid connected electricity

DEFINITION:

Use of fuel sources can be measured using questions adapted from the LSMS Fuel Sources Module related to fuel type, amounts, and source (purchased vs. collected). The purpose of these questions is to collect information on household access and consumption for all fuels used. First, each household will be asked if they used a given fuel source in the past 30 days, and then if yes, a set of 5 follow-up questions would be asked regarding the amount and source(s): the typical unit of measure, approximate weight of the typical unit, total number of units used in the last 30 days, and how many units were purchased versus collected from the forest. Different response options for typical units will be available for either biomass/candles or gas and liquid fuels.

Renewable and clean fuel sources should be defined by the local context but may include agricultural residue, dung, other traditional (sustainably harvested/collected) biomass, hydro, or solar. Generally, firewood would not be included as a renewable fuel source, unless it can be determined that the resource is harvested sustainably. A household will be counted if they report using any of these renewable sources or are grid connected.

While grid electricity is not always (or in some places, not at all) from renewable sources, the objective of this indicator is to measure whether households are increasingly using sources other than local non-renewable sources.

For further guidelines on implementing the LSMS Fuel Sources Module, including detailed notes on each question, please see Chapter 4 of *Energy Policies and Multitopic Household Surveys* available.⁷

ADAPTATION:

The list of household fuels in this module is suggestive and should be adapted for local contexts as appropriate. This includes removing and adding fuel sources that are/not available in the activity area, as well as further adapting or providing definitions for the existing fuel types.

<p>UNIT:</p> <p>Percent</p>	<p>DISAGGREGATE BY:</p> <p>N/A</p>
<p>TYPE:</p> <p>Outcome</p>	<p>DIRECTION OF CHANGE:</p> <p>Higher is better.</p>

⁷ O'Sullivan, Kyran, and Douglas F. Barnes. "Energy Policies and Multitopic Household Surveys." World Bank Working Papers, 2006. <https://doi.org/10.1596/978-0-8213-6878-7>.

INDICATOR TITLE: Percent of households using renewable fuel sources or grid connected electricity

MEASUREMENT NOTES

INTENDED RESPONDENT:

Primary household decision-maker (male or female) from sample households. If this person is not available, another adult from the household may be used for reporting. Note that the household members that pay for or collect fuels are usually the best-informed respondents.

REPORTING NOTES

In addition to reporting the percent value, the number of participant households of the resilience-sensitive activity must be reported, to allow a weighted average percent to be calculated across HEARTH activities for reporting. Additionally, activities should report on the total sample size (including any disaggregation for participant households vs. comparison/control households if an evaluation is being conducted).