



# A Guide for Monitoring and Evaluating Population- Health-Environment Programs

Second Edition

September 2018





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## Second Edition

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## ABBREVIATIONS

ARI	acute respiratory illness
BMU	beach management unit
CBD	community-based distribution
CYP	couple-years of protection
CHW	community health worker
DTP	diphtheria, tetanus, and pertussis
FANTA	Food and Nutrition Technical Assistance III Project
GPS	global positioning system
HOPE-LVB	Health of People and the Environment in the Lake Victoria Basin
IEC	information, education, and communication
IUD	intrauterine device
ITN	insecticide-treated bed nets
M&E	monitoring and evaluation
MCH	maternal and child health
MSC	most significant change
NGO	nongovernmental organization
NRM	natural resource management
ORS	oral rehydration salts
ORT	oral rehydration therapy
PHE	population-health-environment
PMP	performance management plan
RHF	recommended home fluids
SAVA	Sambava-Andapa-Vohemar-Antalaha
TBA	traditional birth attendant
Td	tetanus-diphtheria toxoid
TT	tetanus toxoid
USAID	United States Agency for International Development
WASH	water, sanitation, and hygiene
WHO	World Health Organization

## PREFACE

For some time, community-based development and conservation projects have been combining efforts to help communities manage and conserve their natural resources (or conserve biodiversity) with efforts to improve their health and access to family planning. These combination projects came about as conservation or community development projects focusing on natural resource management (NRM) and biodiversity found that women in the projects often asked for help to plan pregnancies and improve their communities' health. These projects also came to realize that improvements in the health and nutrition of people were necessary, although not sufficient, to advance conservation agendas. These programs evolved into what are now called population, health, and environment (PHE) projects.

PHE projects deliver family planning, basic health services, environmental management or conservation information, and service interventions to rural communities in a coordinated or integrated fashion. PHE projects can look very different depending on local interactions among population dynamics, human health problems, and threats to local environmental conditions. But what all PHE projects have in common is the hypothesis that human populations can be a major threat to the environment, that human health is inextricably linked to the environment, and that working across the human health and environment sectors is more effective than pursuing interventions in isolation. Conservation and NRM organizations also believe that they can build more rapport with local communities by facilitating the delivery of needed health services. Health organizations find they can better reach underserved communities in remote areas by partnering with environmental organizations that are already established in those communities. Many projects have also experienced the added benefits of integrating across the PHE sectors—including more women in natural resources management activities; engaging men on reproductive health and family planning decisions; and reaching underserved communities in remote, but often biologically diverse, areas.

The effective management and execution of any project depends on its ability to define and measure success at several levels. This is important not only so the project or program knows it is on track but also because funders and other stakeholders want to know. A well-thought-out and implemented monitoring and evaluation (M&E) system provides the information for measuring success.

It is with that in mind that MEASURE Evaluation developed the first edition of *A Guide for Monitoring and Evaluating Population-Health-Environment Programs* some 10 years ago (Finn, 2007). Although M&E guides on public health in general and reproductive health in particular were available (see, for example, [https://www.measureevaluation.org/prh/rh\\_indicators](https://www.measureevaluation.org/prh/rh_indicators)), no M&E guide had yet served the needs of all three fields of PHE projects. MEASURE Evaluation therefore developed the guide to include the most important and trusted indicators across the population, health, and environment fields.

With the passage of time and use, and with advancements in the M&E field and in the scope and sophistication of PHE programs, an update to the guide was warranted. This updated guide was developed through a thorough review of the first edition of the guide and consultations with PHE projects and stakeholders. We hope that the updated guide can serve as a comprehensive reference for practitioners of PHE projects. The guide includes several new indicators, cross-referenced to the Sustainable Development Goals; the addition of livelihoods indicators; a new section on what it takes to set up and manage an M&E system; and a new section on evaluating complex programs.



# Part 1: Overview of the Guide



# INTRODUCTION

This guide has five parts:

1. The first part provides an overview of the guide, including its organization, development, and purpose.
2. The second part includes information on monitoring and evaluating programs, including information on several types of data used for M&E of PHE programs.
3. The third part consists of the key components of an M&E system and how to implement the system, including a brief process by which integrated PHE program managers can develop an M&E plan and framework.
4. The fourth part discusses several types of evaluations that can be employed for understanding complex programs.
5. The fifth and final part of this guide includes a list of indicators that can be used to both monitor and evaluate a PHE program. The indicators are divided by technical area: population, health, environment, livelihoods, and integration. Each description of an indicator contains the definition of the indicator, disaggregation (if appropriate), a time frame for collecting the data, data sources, collection considerations, and strengths and limitations of the indicator.

PHE programs should define and measure indicators in the same way across programs; this allows for comparison across countries and programs. The use of comparable measures can also provide international programs with valuable measures of the same indicator in different populations and habitats, enabling findings to be triangulated and regional or local differences to be addressed.

This guide is intended to serve as a reference document for the international PHE community. Although funded by the United States Agency for International Development (USAID), *A Guide for Monitoring and Evaluating Population-Health-Environment Programs, Second Edition*, applies to PHE programs sponsored by other funding agencies, governments, or nongovernmental organizations (NGOs).

Specifically, the guide provides a menu of indicators to be used selectively as part of the M&E of regional programs and country projects, reflecting the local nature of PHE programs. The indicator descriptions are designed to promote standardization of definitions and concepts among the international PHE community. However, even though standardization is useful, organizations should adapt indicators to their specific circumstances. This approach ensures that indicators are relevant to specific organizations, and it promotes ownership of the M&E process. That said, organizations that choose to adapt indicators should clearly state the modified definitions and methods in their M&E plans.

It is not likely that any program or project would use all the indicators outlined in this publication. The choice of indicators should be driven by the objectives, goals, activities, and scale of the program and its projects. Additionally, programs should consider the time and money needed to collect and analyze data for each indicator. For routine monitoring purposes, or for smaller programs, program managers should select a handful of indicators that are economical to collect and are relevant to program objectives. For organizations that need more information, one option is to conduct



special studies to evaluate program performance in specific areas of interest. In this case, managers should stagger the studies to minimize the research burden. It is the responsibility of program managers and implementers, in consultation with donors, to decide which indicators each PHE program should collect, based primarily on what the program is expected to achieve.

Some program and project managers may be overwhelmed by the volume of indicators in this guide and by the process of selection. Some may want to know, for example, only the key 10 to 15 indicators that are essential for monitoring and evaluating PHE programs worldwide. While there is a push to create standard packages of services for PHE programs, program managers may find such a list impractical for monitoring and evaluating their specific interventions. Within the final section of this guide (i.e., the indicators and indicator reference sheets), we have specified some of the most commonly used indicators, as referenced by two large and current PHE programs—HOPE LVB and Tuungane, both in East Africa—in matrices in the introductions to the different subsections. Many global indicators require population and habitat-based surveys, which may be beyond the scope of most PHE programs working in focused regions or with specific interventions or target populations. Most program managers will also want M&E to cover program results as well as progress made in specific functional areas, such as training or behavior change. It is important to keep in mind that the specific indicators useful in a given M&E framework will depend directly on the purpose and identified objectives and results of the program.

This version of the guide includes several updates to the previous guide:

1. A list of livelihoods indicators and new environmental indicators

These additions focus on environmentally friendly and “climate smart” agricultural and marine practices as well as examples of standard climate change indicators for adaptation and mitigation.

2. Enhancement of the M&E sections

An entire chapter has been added on steps to establish and implement an M&E system, all the components needed, and outlines of different methods and data collection tools currently being utilized in the field.

3. A section dedicated to standardizing livelihoods indicators within PHE

Many PHE integrated programs over the past 10 years have included various livelihoods programs, including both small and simple interventions and large and complex ones. We believe that the inclusion of sustainable livelihood programming is key to any impactful environmental or health program. There are direct benefits to health and environmental outcomes when livelihoods components are included. In the past edition of this guide, a few livelihoods indicators were included in the value-added section.

This guide is by no means a comprehensive list of all indicators that could be applied to PHE programs. The process of developing international consensus on frameworks, indicators, and tools typically involves consultations among global partners and takes considerable time and effort. While most of the indicators in this guide have been tested and used extensively in the field, some proposed standard measures of livelihoods, the environment, and integration are new to the field since the first guide’s inception. In fact, these indicators represent an effort by the PHE community to initiate standard measurement and standard packages of services across programs.

Given the diverse specialties involved in PHE work, few can claim to have expertise that spans the full range of PHE activities. While different PHE programs share the vision of integrating the health of humans and the environment, the actual measures of progress toward that goal differ from one type of program to the next. This guide considers previous efforts and suggestions from PHE experts regarding the need for a variety of standardized indicators that PHE programs can use while retaining their diverse programming.

## BACKGROUND

An information system is the backbone of M&E and is founded on a cycle of information sharing and feedback. M&E systems address the challenge of measuring a program's success in meeting its objectives in cost-effective, practical ways. Effectively measurement of programs through M&E provides the evidence base upon which to compare and improve programs, share best practices, secure donor and community support, advocate for services or funding, and ultimately meet program goals and objectives. Without a fully functioning M&E system, programs lack the evidence to support the credibility of their work. M&E systems generate information that can be used in empirical analysis and compelling arguments to advocate for policy reports and development.

The need to develop and implement M&E plans based on uniform measures that create an evidence base for worldwide PHE and livelihoods projects and programs has long been recognized (Kleinau & Talbot, 2003; Pielemeier, 2005; Margoluis & Salafsky, 1998; Oldham, 2006). While there has been substantial progress since the first edition of this guide was disseminated, major gaps still exist, such as standardization of indicators and ownership of and commitment to M&E.

Experts recommend that M&E should be part of program design and that the definitions and selection of indicators should guide program implementation and progress. PHE programs may have difficulty deciding whether to use single-sector indicators or indicators that measure the effects of multi-sector collaboration. Donors may expect the former to show results better, while the latter may better reflect coordination and integration between programs. M&E researchers have emphasized that cross-sectoral collaboration on M&E is necessary to establish integrated-intervention impact (Kleinau & Talbot, 2003).

PHE proponents contend that integrated programs, particularly those integrating population, health, environment, and livelihoods, produce better outcomes than single-sector, or siloed, programming. However, the evidence base for this argument is still somewhat limited. PHE advocates have championed the results of studies showing that these integrated programs are highly preferable to single-sector programs for several reasons, including (but not limited to) cost savings, the ability to reach new or nontraditional audiences with conservation or health/family planning messaging and programming, and the fact that families and communities rely on services across all PHE sectors (Kleinau & Talbot, 2003).

Providing evidence for the efficacy of PHE projects requires formal evaluations. Large-scale evaluations, which employ quasi-experimental designs, are not only costly but also time-consuming. They require more time and large sample sizes to produce meaningful results on an impact level for programs looking at habitat-level measures such as forest regeneration, climate change, wildlife conservation, and behavior change. Due to time, monetary, and other human resource and technological constraints, short-term outcomes rather than impact outcomes are usually used as a proxy for evidence of improvement or program success.

New methods for evaluating the impacts of complex programs, particularly how integration can be measured and reported, have begun emerging within the PHE community. These methods, which will be discussed later in this manual, include the use of qualitative evaluations, participatory evaluations, and mixed-methods research. These new methods offer insight not only into how to offer less expensive and time-consuming options, but also into how to adequately capture the complexity and nonlinearity of many outcomes and impacts of PHE programs and other integrated programming.

## PURPOSE OF THIS GUIDE

The overall objective of this guide is to encourage program M&E and improve the quality of work in the PHE and livelihoods sectors. The guide provides a list of widely used M&E indicators for PHE and livelihoods programs in developing countries. The indicators are organized using a generic conceptual framework that maps the pathways through which programs achieve results, constituting a logical framework for developing an M&E plan with the most appropriate indicators.

This guide focuses on indicators at all stages of program achievement (i.e., inputs, processes, outputs, outcomes) and across multiple sub-specialties within each technical area. The guide also presents a list of standard indicators to unify a national PHE project and discusses data collection and sources, data quality, and information-use protocols. The guide does not, however, present all the possible indicators that may be applicable to every PHE program, nor does it present every possible way these example indicators can or should be used. The indicators should be seen as modifiable, to be used and specified for one's own program needs. Local, program-specific indicators should be developed with careful consideration to resources and utility.

### **The following are the specific objectives of this guide:**

- Provide guidelines on setting up and operationalizing an M&E system, including an M&E framework and M&E plan.
- Illustrate, using specific examples and references, current PHE programming M&E practices being used in the field.
- Showcase indicators currently being collected in field programs.
- Compile, in a single publication, a menu of PHE and livelihoods indicators judged most useful in monitoring and evaluating PHE programs at both the program and population/habitat levels.
- Define these indicators in an effort to encourage the use of standardized indicators and terminology across PHE programs, countries, and donor agencies.
- Discuss new and emergent methods of evaluating complex PHE programs.
- Promote the M&E of PHE programs by making indicators available and easier to use.

### **The following are the intended audience of the PHE indicator guide:**

- Staff working for international PHE programs in resource-poor settings
- M&E specialists working in PHE
- Public and private donors supporting PHE programs
- Potential PHE practitioners interested in learning more about M&E of PHE programs
- Directors and managers of PHE programs worldwide

## HOW THE INDICATORS WERE SELECTED

In 2006, PHE practitioners from six organizations were consulted in the development of the first edition of the guide and in the selection of indicators. These organizations represented a cross section of local, national, and global commitment to PHE integration and effectiveness. In addition to these individual consultations, a technical advisory group of PHE practitioners and managers met to set parameters and criteria for a set of standard indicators for the PHE field of practice.

The guide has been updated to its newest version through a combination of site visits to existing PHE programs, literature reviews, short questionnaires to field staff, and consultations with PHE practitioners. To collect information about current practices for routine M&E by PHE programs, MEASURE Evaluation undertook a landscape analysis of M&E practices among a sample of currently active PHE projects. This consisted of assembling key M&E elements among the projects and analyzing the responses to look for patterns. Also, an extensive field visit was made to Pathfinder International's Health of People and the Environment in the Lake Victoria Basin (HOPE-LVB) project in Uganda and Kenya, one of the larger PHE programs in East Africa to review its M&E system.

To better understand current M&E practices, we developed a simple questionnaire that was emailed to 17 active PHE projects. The target list of projects was drawn from a listing of projects on the *PHE Activity Map*.<sup>1</sup> This map had a list of current and recent PHE projects and was a good source of information. From the list of 17 active projects, we received eight responses.

Of the eight organizations that completed the questionnaire, six were funded by USAID or a large donor or foundation, one was funded by private donations (Sambava-Andapa-Vohemar-Antalaha [SAVA] Conservation), and one had been funded over time by various organizations and funders (TRY Oyster). Of the respondents, all but one (GLTI) was conducting PHE activities. GLTI was mainly doing reproductive health and family planning activities with a small number of other health-related activities; we were unable to find environmental/conservation activities in the documents the organizations provided. The PHE-Ethiopia Consortium sent information on a "terminal evaluation" for one of GLTI's projects, though it was not clear what PHE activities they had conducted.<sup>2</sup>

In terms of the types of services and interventions offered, several of the PHE projects reviewed had a wide variety of health activities focusing on nutrition; primary health; water, sanitation, and hygiene (WASH); maternal and child health (MCH); HIV; and even cervical cancer. These programs had very broad outcomes, particularly in health programming. Reproductive health and family planning activities were pretty standard across most programs and included activities such as demand creation, access to methods, community health worker (CHW) outreach, and education.

Environmental activities, as expected, were specific to the programs because of geographic location and areas of intervention. They included sustainable practices (e.g., farming, fishing), reforestation, sustainable livelihoods/income-generating activities, and biodiversity protection (SAVA Conservation).

Regarding the M&E systems of the responding organizations, the USAID- and foundation-funded PHE projects had well-articulated performance management plans (PMPs), indicators, and M&E resources either within their organization or through outside access to M&E staff (Tuungane/Tanzania, HOPE-LBVC, SHAPE-LBV, GLTI, LBVC, and Population, Health, and Environment Ethiopia Consortium). M&E budgets were between 5 percent and 30 percent, with most around 10 percent to 15 percent. SAVA Conservation and TRY Oyster did not have M&E staff, M&E resources/budgets, PMPs, indicators, or

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<sup>1</sup> <https://fusiontables.google.com/DataSource?docid=1u5b3D-tJbvdBCN05iA5bzfOCc51htQdyxyHYvZPN#map:id=3>

<sup>2</sup> Since this guide was written, GLTI has closed.

baselines. TRY Oyster said it had baselines but did not do any regular M&E. SAVA Conservation had some basic data related to some of its activities but did not have a formal M&E system. The PHE M&E guide was used by a few respondents, mainly for the development of indicators and data collection tools and as a guide to develop a PMP (SHAPE-LBV). All respondents except SAVA and TRY had a theory of change, and most had a fairly sophisticated logical framework.

The landscape analysis and questionnaire responses shaped the revision of this guide. Included in the updates are new and proposed methods for evaluating programs, including various nontraditional evaluations, data collection methods, and technologies for monitoring or evaluating PHE programs. Additionally, and most importantly, the new edition of this guide includes new indicators for measuring environmental activities, including “climate smart” farming and fishing methods (i.e., a subset of standardized climate change indicators) and livelihoods programming.

## Logical Framework for PHE and Livelihoods Programs

This guide includes indicators that measure achievements for each element in the standard logic model for program development (Figure 1). To be effective, indicators must meet a variety of requirements. The indicators in this document were chosen to be the following:

- *Valid*: accurately measuring a behavior, practice, or task
- *Reliable*: consistently measurable in the same way by different observers
- *Precise*: operationally defined in clear terms
- *Measurable*: quantifiable using available tools and methods
- *Timely*: providing measurement at intervals that are relevant and appropriate for program goals and activities
- *Programmatically important*: linked to a public health impact or to achieving the objectives that are needed for impact

**Figure 1. Standard Logic Model for Program Development**



The criteria used for selecting these PHE indicators took into account three factors:

1. The indicator’s relevance to PHE programs
2. The feasibility that PHE programs can collect the data
3. The added value that collecting the indicator would give to the PHE program

Relevance to PHE projects and programs can be more specifically defined as the indicator’s usefulness in responding to donor requirements and in demonstrating project results, both for improving program management and for increasing the evidence base for advocacy purposes. Although the indicators in this guide are divided by technical sector, PHE programs aim to integrate the four sectors in the implementation. Therefore, some sector-specific indicators reflect the linked nature of the programs better than others, and reflect the use of indicators in past and current PHE programs.

The feasibility of data collection refers to the consideration of the inputs required from the PHE program to obtain the data for the indicator. Feasibility considerations for this guide are **cost, timing** or **frequency** of data collection, and whether specific skills or expertise are required for indicator collection. This guide contains indicators that require varying degrees of knowledge and resources to allow program managers to choose the most appropriate and feasible indicators for their own programs. We have aligned the indicators within this guide to correspond with what programs are collecting within each category. In the guide, we use and reference five contextual categories of indicators that are central to PHE programs:

1. Family planning, reproductive health, and sexual health (POPULATION)
2. MCH, WASH, and environmental health (HEALTH)
3. NRM, law enforcement, forestation, agri-environment, biodiversity, and climate change (ENVIRONMENT)
4. Income generation, household well-being, and resiliency (LIVELIHOODS)
5. Integration programming (INTEGRATION)



# SUMMARY OF INDICATORS

The following indicators are described in more detail in the indicator reference sheets found in [Part Five](#).

## Population Indicators

### Family Planning and Reproductive Health

- Percentage of program staff trained to work with or provide reproductive health services to adolescents
- Percentage of men and women who know where to access modern family planning services
- Percentage of men who support use of modern contraception for themselves or their partners
- Number of adults who have been referred for family planning services by PHE staff
- Percentage of women of reproductive age (15–49 years) who were clients of a community-based distributor in the past year
- Couple-years of protection (CYP)
- Percentage of skilled health personnel knowledgeable in obstetric warning signs
- Number of acceptors new to modern contraception
- Contraceptive prevalence rate
- Percentage of deliveries occurring in a health facility
- Percentage of births attended by skilled health personnel
- Percentage of women attended to at least once during pregnancy for reasons related to pregnancy
- Percentage of women who attended at least four antenatal care visits during pregnancy

### Sexual Health

- Percentage of youth who used a condom at last high-risk sex in the previous year
- Percentage of adults who used a condom at last high-risk sex in the previous year

## Health indicators

### Maternal and Child Health

- Number of doses of tetanus vaccine distributed
- Number of insecticide-treated bed nets (ITNs) distributed
- Number of packets of oral rehydration salts (ORS) distributed
- Number of safe water storage vessels distributed
- Percentage of pregnant women receiving at least two doses of tetanus toxoid (TT) vaccine
- Percentage of children ages 12–23 months fully immunized before 12 months
- Average household distance/time to the nearest health center
- Oral rehydration therapy (ORT) use rate
- Percentage of children under five who are underweight

- Percentage of children who show improvement on a growth chart
- Number of children under five presenting at a health facility with diarrhea, fever, or acute respiratory illness (ARI) in the past month
- Percentage of health facilities that have all essential medicines and commodities in stock on the day of visit

## Water, Sanitation, Hygiene, and Environmental Health

- Percentage of households with access to an improved source of drinking water
- Average time spent by household members to collect water
- Percentage of households using an improved water source
- Percentage of households with an improved toilet facility
- Percentage of households with soap or basic handwashing facilities
- Percentage of households storing drinking water safely
- Percentage of children under five who slept under an ITN the previous night
- Percentage of households with ventilation in cooking areas

## Environment Indicators

### Natural Resource Management and Law Enforcement

- Percentage of communities in target area that have developed a community-based NRM plan
- Number of officers trained on laws and enforcement procedures and posted to a permanent enforcement position
- Percentage of communities with functioning community-based NRM committees
- Percentage of youth participating on community-based NRM committees
- Percentage of leadership positions held by women on community-based NRM committees
- Percentage of community-based NRM plans that are approved by a government authority
- Number of validated infractions reported in deputy logs
- Hours of enforcement patrols logged
- Number of fish breeding sites demarcated and protected
- Area of legally protected habitat

### Reforestation

- Number of trees planted
- Tree/seedling survival rate after first growing season
- Number of households using a fuel-efficient stove
- Average household consumption of firewood in target areas
- Area of secondary forest regenerated

## Agri-Environment

- Number of educational sessions on improved agricultural/marine practices
- Percentage of farmers/fishers who adopt improved agricultural/marine practices
- Number of small farms using soil and water conservation technologies
- Number of crop species in agricultural use in project/program area
- Percentage of farming households practicing monoculture cropping
- Number of farming households utilizing cover crops
- Number of farming households practicing agroforestry
- Area of land that has changed status from natural to agricultural land

## Biodiversity

- Area of habitat under improved management
- Population structure of species
- Species richness
- Species abundance and distribution

## Climate Change

- Number of people trained in climate change adaptation
- Number of institutions with improved capacity to assess or address climate change risks
- Amount of investment mobilized/budgeted for climate change adaptation by national, regional, local, or international organizations
- Greenhouse gas emissions reduced, sequestered, or avoided through clean energy activities

## Livelihoods Indicators

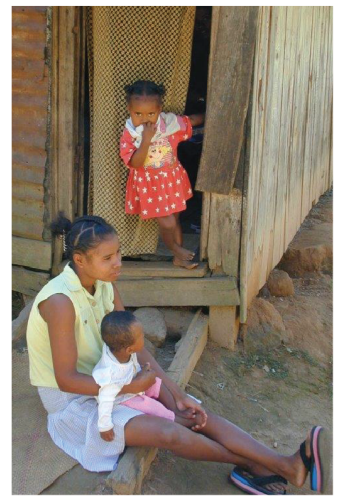
- Number of households with home gardens/live fences/home orchards
- Number of trainings/workshops held on alternative livelihoods and income-generating activities
- Number of farmers aware of sustainable crop production practices, technologies, and inputs
- Yield per area per year/cropping cycle/fishing effort/season
- Number of households with access to financial services
- Number of women who have attended an alternative livelihoods workshop or training
- Number of sustainable micro- or small businesses created as a result of a PHE-sponsored workshop or training
- Months of inadequate household food provisioning
- Household income
- Household dietary diversity
- Number of households with at least one secondary source of income
- Number of households engaged in alternative livelihoods activities

- Percentage of households with increased income due to alternative livelihoods activities
- Number of farming households that are members of farming cooperatives or producer organizations

### **Integration Indicators**

- Number of linked messages/materials created
- Number of model households in project areas
- Number of instances of population, health, or environmental organizations addressing nontraditional audiences
- Number and frequency of PHE educational sessions provided in the target community
- Number of new PHE partnerships created that make linkages among organizations or institutions from different sectors
- Number of instances of organizations facilitating access to services outside of their traditional sectors
- Number of policymakers, media, and scholars knowledgeable about or aware of a specific PHE issue
- Percentage of households knowledgeable about or aware of a specific PHE issue
- Number of enabling local ordinances/policies supporting PHE
- Number of placements of linked PHE messages in print and electronic media by independent sources

# Part 2: Program Monitoring and Evaluation



# MONITORING AND EVALUATION

## Program Monitoring

Monitoring is the routine tracking of program activities by regularly measuring whether planned activities are being carried out. Monitoring informs program and project managers whether activities are being implemented according to plan, at what cost they are being implemented, how well the program is functioning at various levels, the extent to which a program's services are being used, whether interim targets are being met, and whether key performance measures are being achieved. Examples of monitoring data for PHE programs include health facility records or service statistics (e.g., child immunizations or deliveries taking place in a health facility), community outreach through awareness activities or CHW visits (e.g., commodities distributed, target population reached with information, education, and communication [IEC] materials) or training activities (e.g., target population attending trainings or workshops). Because program-monitoring data are sometimes used in evaluation activities, both monitoring and evaluation are necessary to measure PHE programs effectively. A comparison of two is shown in Table 1.

## Program Evaluation

Evaluation is designed to determine the value of a specific program, intervention, or project in meeting stated objectives and outcomes. It is the evaluation of a program's processes, outcomes, or impacts to help answer three basic questions: How well has the project been implemented? Has the desired change been achieved? And if the change has been achieved, to what extent can it be attributed to the project?

Drawing from a program's list of indicators, mixed-data sources, and quality data, evaluators can derive information to report program achievements. This information can be used not only to report to donors but also, more importantly, to revise program practices to better achieve desired outcomes. Evaluations require planning, funding, and time. They are possible only if an M&E system is functioning and delivering quality data on key indicators in a timely manner. Box 1 describes the main types of program evaluation.

**Table 1. Comparison of program monitoring and program evaluation**

Monitoring	Evaluation
Links activities to objectives	Analyzes why intended results were or were not achieved
Translates objectives into performance indicators and sets targets	Assesses causal contributions of activities to results
Routinely collects data on indicators	Examines implementation process
Compares results with targets	Explores unintended outcomes
Reports regular progress and alerts to problems	Provides lessons, highlights substantial accomplishments, and offers recommendations for improvements

Source: Modified from Kusek & Rist, 2004

### **Box 1. Main Types of Program Evaluation**

Process Evaluation: A process evaluation's main purpose is to assess and document how the program or project is being implemented. Key questions a process evaluation can help address include the following: What difficulties or challenges were encountered while implementing the program? How well was the program implemented? Did the program reach its intended beneficiaries?

Outcome Evaluation: An outcome evaluation assesses the program or project's effectiveness at reaching the intended changes or outcomes. Key questions in an outcome evaluation include the following: Did the program succeed in helping households increase their dietary intake? Was knowledge of sustainable farming increased as a result of workshops or trainings?

Impact Evaluation: Impact and outcome evaluations are sometimes used interchangeably by different groups of people. While there is some overlap in impact and outcome evaluations, in terms of ultimately trying to understand how the program or project has affected its beneficiaries, impact evaluations focus on longer-term or lasting impacts on the target population. In some cases, an impact evaluation can tell to what degree impacts can be directly attributed to the program. Your program's logic model can help you differentiate between outcomes and impacts as well. Impact evaluations tend to seek answers to whether the program affected the target population by increasing overall health and well-being, increasing households' abilities to withstand financial hardships, or reducing the total fertility rate in a community.

# TYPES OF DATA USED TO MONITOR AND EVALUATE PHE PROGRAMS

Data for monitoring and evaluating PHE programs come from a wide range of stakeholders and sectors and can be either quantitative or qualitative. Monitoring data are often collected on a routine basis from the program records, service delivery points, or participatory focus groups. Evaluation data can be gathered from a quasi-experimental design or from a participatory qualitative method such as creating a seasonal calendar. To effectively monitor and evaluate an integrated PHE program, a program will likely combine several methods to tell a rich story of program implementation, outcomes, and impacts.

## Quantitative Versus Qualitative Data

Mixing qualitative and quantitative data sources can strengthen the evidence for achieving program objectives and goals. Donors who require certain indicators often request quantitative information (e.g., numbers, percentages, rates, ratios); however, PHE programs benefit by supporting these numbers with qualitative evidence to tell the complete story of program integration.

Due to the specific questions that arise in implementing integrated programs, special care should be taken to select methodologies that provide information about processes and outcomes coming from qualitative and quantitative methods. Table 2 explores several differences between the two types of methods.

**Table 2. Differences between quantitative and qualitative methods**

Quantitative Methods	Qualitative Methods
Describe how many and how much	Describe how and why
Use predominately closed-ended questions	Use predominately observations and open-ended questions
Provide numerical data and statistics	Provide data on perceptions and beliefs as well as descriptions of conditions and care
Require large samples, preferably selected at random	Permit more limited samples, generally not selected at random
Yield more superficial responses to sensitive topics	Offer more in-depth responses on sensitive topics
Produce results that can be generalized to the target population or ecosystem	Produce results that apply only to the segment of the population or specific sub-area of the ecosystem that is studied

## Program-Based versus Population-Based and Habitat-Based Data

It is important to distinguish between program-based and population-based or habitat-based measures. **Program-based** indicators usually measure inputs, processes, and outputs and are often collected through routine monitoring. **Population-** and **habitat-based** indicators usually measure outcomes and some outputs and are most often, though not exclusively, collected through evaluation.

- **Program-based** data consist of information available from program sources (e.g., facility-based/community-based service statistics, project records of trainings and educational sessions, administrative records) or information that can be obtained from on-site collection (e.g., observation, client-provider interaction, interviews with farmers, NRM committee functions). Where such systems are functional, routine information systems are the primary source of this



type of information. **Program-based** information is very important for understanding program performance and the type of outputs programs achieve. When data on the entire regional populations are available as a denominator, estimated **program-based** information can reflect service coverage.

- **Population-based** data aim to evaluate effects on the general population. This term can also refer to a smaller geographic region (e.g., the target area for the specific project) if the data are drawn from a representative sample.
- **Habitat-based** data refer to evaluation of the larger target area of the environment. Rather than program-based measures (e.g., trees planted, improved practice sessions provided, enforcement officers trained), **habitat-based** measures represent outcomes on the entire habitat (e.g., forest regenerated, area under improved management, species abundance).

## Inputs and Processes

**Inputs** refer to human, financial, and material resources a program uses, while **processes** refer to the activities programs carry out to achieve the objectives. It is important to measure these two levels separately, because it is possible to have a high level of inputs for a poorly delivered program. For instance, a PHE program could provide inputs for new income-generating activities in the community but fail to give the educational sessions the community needs to learn how to do the new activities. In this case, the inputs may have been available on time and be of high quality, but the activities that were necessary to achieve the objectives of the project were not completed.

## METHODS AND DATA SOURCES USED IN THIS GUIDE

Table 3 provides an overview of each measurement level used in this guide, as well as related data sources and time frames for collection. The indicators selected in these categories do not measure whether the program has had an impact. It is not the indicators but the evaluation design that would measure the impact of the program. The table has been generalized for a wide variety of programs with different objectives and goals.

**Table 3. Data types by level of measurement**

Level of Measurement	Methods	Data Sources	Time Frame
Inputs: Program-based measures	Trend analysis Rapid appraisal	Service statistics Project records Key informant interviews Direct observation Facility surveys Focus groups	Progress within six months of project start and routinely collected every one to three months throughout project cycle
Processes: Program-based measures	Trend analysis Rapid appraisal	Service statistics Project records Key informant interviews Direct observation Facility surveys Focus groups	First six months to one year of program implementation
Outputs: Program-based measures	Trend analysis Transect surveys	Service statistics Project records Direct observation	One to two years
Outcomes: Population-based or habitat-based measures	Population-based surveys Transect surveys Mapping	Questionnaires Survey forms Global positioning systems, flyovers Satellite imagery Species census Legal records Logbooks	Two to three years for short-term and three to five years or longer for long-term

### Trend or Time Series Analysis

**Data Sources:** Service statistics, project records.

Data sources often include health facility records (e.g., patient records, stock inventories, training course evaluations, budgets, strategic plans, operational plans, M&E plans) and environment forms (e.g., project logbooks and forms from educational sessions, NRM plan development) that can be compiled to generate information regarding service statistics and logistics data.

Program monitoring data can examine progress in implementation over time. Programs may select key indicators based on stakeholder interest and compare the information over time. From this comparison, program teams can investigate changes in program operations, budgets, and other factors to account for any progress.

Figure 2 provides an example of a monthly report register that facilities can use to capture statistics such as antenatal visits, family planning methods (new users and revisits), and number of contraceptives dispersed.

Figure 2. Example of a monthly report register

**HMIS FORM 105: HEALTH UNIT OUTPATIENT MONTHLY REPORT** Ministry of Health Page 2

**2. MATERNAL AND CHILD HEALTH (MCH)**

2.1 ANTENATAL		2.5 FAMILY PLANNING METHODS		NEW USERS	REVISITS																														
	NUMBER																																		
A1-ANC 1 <sup>st</sup> Visit		F1-Oral - Lo-Femeral																																	
A2-ANC 4 <sup>th</sup> Visit		F2-Oral - Microgynon																																	
A3- Total ANC visits (new clients + Re-attendances)		F3-Oral - Ovrette or another POP																																	
A4-ANC Referrals to unit		F4-Oral - Others																																	
A5-ANC Referrals from unit		F5-Female condoms																																	
A6-First dose IPT (IPT1)		F6-Male condoms																																	
A7-Second dose IPT (IPT2)		F7-4IDs																																	
A8-Pregnant Women receiving Iron-Folic Acid on ANC 1 <sup>st</sup> Visit		F8-Injectable																																	
A9-Pregnant women receiving Iron		F9-Natural																																	
A10-Pregnant women tested for syphilis		F10-Other methods																																	
A11-Pregnant women tested positive for syphilis		Total family planning users																																	
A12-Pregnant women counseled, test and received HIV test results		F11-Number of HIV positive family planning users																																	
A13-HIV positive pregnant women given cotrimoxazole for prophylaxis		F12-Number of first-visit clients (of the year) for this month																																	
A14-Pregnant women tested positive for HIV																																			
A15 HIV positive pregnant women assessed for ART eligibility																																			
A16-Pregnant women who knew their HIV status before the 1 <sup>st</sup> ANC visit																																			
A17-Pregnant women given ARVs for prophylaxis (PMTCT)	SD NVP AZT - SD NVP 3TC-AZT-SD NVP	<b>2.6 CONTRACEPTIVES DISPENSED</b>																																	
A18-Others Specify for regimens covered		<table border="1"> <thead> <tr> <th>CONTRACEPTIVE</th> <th>No. Dispensed at Unit</th> <th>No. Dispensed by CORPs</th> </tr> </thead> <tbody> <tr> <td>D1-Oral - Lo-Femeral (Cycles)</td> <td></td> <td></td> </tr> <tr> <td>D2-Oral - Microgynon (Cycles)</td> <td></td> <td></td> </tr> <tr> <td>D3-Oral - Ovrette or another POP (Cycles)</td> <td></td> <td></td> </tr> <tr> <td>D4-Oral - Others (Cycles)</td> <td></td> <td></td> </tr> <tr> <td>D5-Female condoms (Pieces)</td> <td></td> <td></td> </tr> <tr> <td>D6-Male condoms (Pieces)</td> <td></td> <td></td> </tr> <tr> <td>D7-4IDs (Pieces)</td> <td></td> <td></td> </tr> <tr> <td>D8-Injectable (Doses)</td> <td></td> <td></td> </tr> <tr> <td>D9-Emergency Contraceptives</td> <td></td> <td></td> </tr> </tbody> </table>				CONTRACEPTIVE	No. Dispensed at Unit	No. Dispensed by CORPs	D1-Oral - Lo-Femeral (Cycles)			D2-Oral - Microgynon (Cycles)			D3-Oral - Ovrette or another POP (Cycles)			D4-Oral - Others (Cycles)			D5-Female condoms (Pieces)			D6-Male condoms (Pieces)			D7-4IDs (Pieces)			D8-Injectable (Doses)			D9-Emergency Contraceptives		
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D8-Injectable (Doses)																																			
D9-Emergency Contraceptives																																			
A19-Pregnant women on ART for their own health																																			
A20-Male partners tested and received HIV results in PMTCT																																			
<b>2.2 MATERNITY</b>																																			
M1-Admissions																																			
M2-Referrals to unit																																			
M3-Referrals from unit																																			
M4-Deliveries in unit																																			
M5-Deliveries HIV positive in unit																																			
M6-Deliveries HIV positive who swallowed ARVs																																			

Source: Uganda Ministry of Health, HMIS Form 10

## Rapid Appraisal (Qualitative)

**Data Sources:** Direct observations, focus groups, key informant interviews, facility surveys, participatory rural appraisal tools.

While formal surveys may be conducted at long intervals (i.e., every five years over several months), rapid appraisal methods can provide interim information on program performance. Rapid appraisal methods are quick, low-cost ways to gather information from stakeholders to respond to decision makers. They generally require four to six weeks depending on the population size, location, and number of sites observed. Rapid appraisals can include direct observations, focus groups, key informant interviews, and facility surveys.

**Key informant and in-depth interviews** tend to be open-ended, ranging from a total lack of structure and minimum control over a respondent's answers, to being semi-structured and based on a written list of questions and topics that need to be covered in a particular order, to being fully structured and using techniques that may require respondents to rate or rank a list of things. Open-ended questions and probes are used to elicit a respondent's experiences, opinions, feelings, and knowledge.

**Focus groups discussions** involve a small group of people (usually 6–12) and a moderator to discuss a particular topic. Focus groups are less expensive than surveys to conduct, and they provide insights into **how** people feel about a particular issue or behavior and **why** they feel that way. Care must be exercised, however, in selecting participants in order to avoid bias so that background characteristics (e.g., age, sex, income) are balanced in the group.

**Direct observations** come in the form of detailed descriptions of fieldwork activities, behaviors, actions, conversations, interpersonal reactions, and organizational and community processes. These detailed descriptions include the context in which the observations were made. Direct observations require the investigator to engage personally in all or part of the program under study or participate as a regular member or client, as a participant-observer, to gain greater insights than could be obtained from a survey questionnaire.

**Facility surveys** are a combination of interviews with staff and direct observations of conditions in a

facility, in the provision of services, or in the environment (e.g., counting medical equipment or supplies or, in the case of biodiversity preservation, counting species) (Table 4). This type of observational survey could also be built into a population-based survey (i.e., observing the availability of handwashing supplies in a household) and does not necessarily require skills in questioning.

**Table 4. Example of a facility survey, Tuungane Project**

No.	Questions and Filters	Coding Categories
301	Does this health facility offer any family planning services, including clinical methods, <u>counseling, or natural family planning</u> ?	Yes.....1 No .....2
302	Does the facility mobilize or sensitize the community on family planning?	Yes.....1 No.....2
303	Are family planning services (i.e., clinical methods, counseling, natural family planning) being offered today?	Yes.....1 No .....2
304	How many staff members in this clinic/service area provide consultation services, provide counseling/education services, or conduct procedures for family planning clients?	A. Consultation..... B. Counseling..... C. H/Education ..... D. Family planning..... None.....00
305	Do you have a staff member in this clinic/service area who has had specific training (i.e., in-service training) for providing family planning consultation services, providing counseling/education, or conducting procedures? IF YES, ASK: Is the staff member present today?	YES, PRESENT TODAY.....1 YES, NOT PRESENT TODAY.....2 NO.....3

## Box 2. Participatory Rural Appraisal Methods

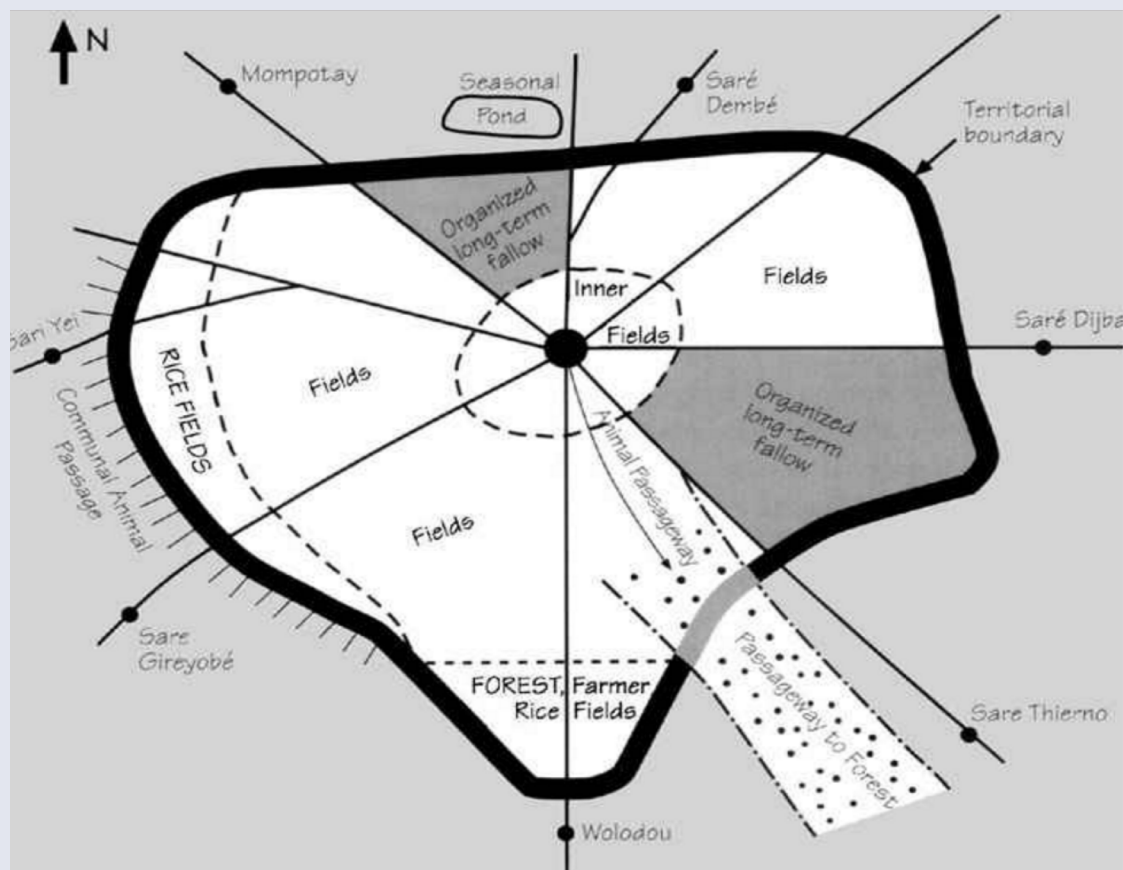
While many measures included in this guide are highly quantitative in nature, many programs are opting for more participatory methods to capture key information about changes that are noticed on a community level. Some of the most frequently used methods are briefly outlined here.

### Village Resource Map

A village resource map is a useful tool for understanding local perceptions of natural resources in the community. Generally, it is advisable to have separate groups of men and women participate in this activity, as not only do they perceive resources differently but also they use these resources differently. After the general map is drawn, key questions about these resources are asked to facilitate discussion. Questions include the following:

- What resources are abundant? Which are scarce?
- Do women have access to land for agricultural use?
- Do vulnerable households have access to land for agricultural use?
- What areas are used for water collection? Firewood collection?

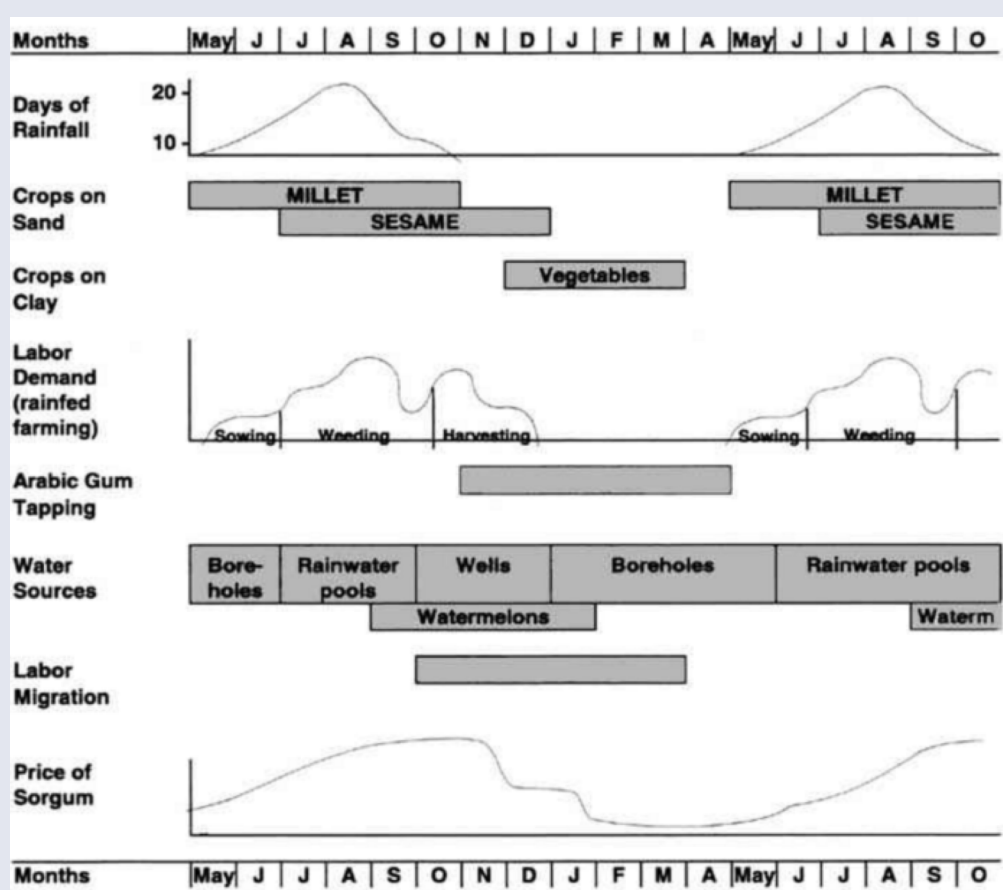
Due to the low cost of this method, a village resource map can be used at more frequent intervals to understand changes over time in your program areas.



### Box 3. Seasonal Calendars

A seasonal calendar is a visual method of showing the distribution of seasonally varying phenomena (e.g., economic activities, resources, production activities, problems, illness/disease, migration, natural events/phenomena) over time. What can it be used for?

- Understanding seasonal differences during livelihood and vulnerability analysis
- Illustrating dynamic dimensions of well-being, which are often poorly illustrated through conventional forms of poverty assessment
- Understanding the time of the year when different social groups are more or less vulnerable
- Identifying some of the reducing, mitigating, and coping strategies people use to manage risk
- Identifying periods when specific groups of people usually suffer particular hardship so that appropriate "safety nets" can be set in place or other remedial actions can be taken



Source: FAO. The Forest Manager's Guide to Participatory Forest Management: Module 3.

## Population-Based Surveys

**Data Sources:** Questionnaires (sometimes include direct observation).

Population-based surveys collect information on key topics from a representative sample of people or households and then generalize that information to the entire population. One example of a population-based survey at the national level is the demographic and health survey (<http://dhsprogram.com/>). Surveys may also be conducted at the regional or district level, or among a target population (e.g., youth, a most-at-risk population, women of reproductive age).

Most PHE projects/programs target either a particular demographic group or a subnational or subregional population. Although large population-based surveys draw from a population larger than a typical PHE program's clientele, they can provide PHE programs with information on output-level and outcome-level indicators. A population-based surveys' structured interviews involve developing questionnaires and a sampling method, and posing closed questions (i.e., those with a defined answer) to garner quantitative data that are representative at the population level for outputs and outcomes (Box 4). (For PHE programs, the population level refers to the local level for the population targeted by the project.) The data need to be collected and analyzed with the highest degree of integrity and may require special expertise. Although some population-based surveys conducted by PHE programs may not be large in scale, a specialized agency or institution should be contracted to perform surveys at the population level to avoid bias in the data collection.

### Box 4. Steps in Carrying Out a Survey Using a Structured Questionnaire

- Plan the survey.
- Develop the questionnaire.
- Review the questionnaire with experts and stakeholders and incorporate their revisions. Develop the study protocol (including the objective, target population, sample design, sample size, survey instruments, and time line).
- Have the study approved by the appropriate national ethics board.
- Select and train the interviewers.
- Carry out the fieldwork.
- Conduct a pretest in the field (among respondents similar to the population to be interviewed).
- Modify the instruments based on the pretest.
- Coordinate logistical aspects for the fieldwork.
- Collect the data.
- Process and analyze the data.
- Review the questionnaires while the interviewers are still on location.
- Code the data.
- Enter the data into the computer (with a program such as Epi-Info or SPSS).
- Prepare the tables of results, per the analysis plan.
- Produce the results and disseminate the report.
- Prepare a final report.
- Share the results with people responsible for the project and with other interested parties.

## Transect Survey

**Data Sources:** Survey forms (mainly includes direct observation).

A transect survey can measure the area of the habitat a project is targeting in its intervention. Transect routes should evenly sample the habitat types and NRM activities on sites. As much as possible, each survey should take place at the same time of day with the same weather conditions, location, overall methods, and observer training level so that these factors do not unevenly influence recorded results. This data collection method can produce information for both quantitative (e.g., species counts) and qualitative (e.g., condition of a habitat) aspects of the natural environment.

Transects should be formed by walking or driving the transect line in a given direction in a straight line. Data collectors should sample points at predetermined distances (e.g., approximately every 100 m) for a selected total distance (e.g., 1 or 2 km per transect). Data collectors should travel the grid or transect at a slow, steady pace and take the same route for each survey. Transects are divided into sections corresponding to different habitats or management units. One method of data collection is to mark off targeted fixed-route grids/transects to survey several times during each two- or three-year period. Species are recorded along the route on a regular (e.g., monthly or yearly) basis. Data collectors should never wait at “hotspots” where they have seen species previously, as this will lead to bias. A standardized field recording form should be used to record observations.

The time of day of the transect walks should also be held constant for comparison purposes. The grid/transect should be surveyed by trained observers at predetermined times of the day or night (depending on the species) at the same times each year. Surveys should only take place during prespecified “good” weather conditions, which will depend on the target species. Variations in species distribution and migration/hibernation behaviors must be taken into account when deciding when and where to conduct field surveys. The goal is to avoid biasing data collection by conducting a survey, for example, during weather conditions that would cause the selected species not to be active and out in their normal habitat.

Marine sampling may be done in a similar way by using snorkeling, scuba diving, boat surveys, or, for large marine mammals, aerial surveys. Some possible methodologies include use of quadrates, band transects, random-point contact plots, roving diver fish counts, artificial recruitment, size frequency measurements, and aerial photos.

Data collection may require several people skilled in identifying species’ normal ranges or habitats. Necessary materials may include spotting scopes, spotlights, night-vision goggles, binoculars, cameras, scuba diving equipment, global positioning system (GPS) equipment, compasses, standardized notebooks to record observations, surveyor tape measures, diameter tape measures, and a biodegradable topofil line (i.e., a thread measuring device with a counter that is unreeled).

## Mapping

**Data Sources:** Aerial photographs, global positioning systems, satellite images, remote sensing.

Program staff can use maps to measure changes in land use, land cover, land status, species location, species density, and species migration. The various technologies for mapping interventions and tracking indicators require different levels of knowledge and expertise. Taking aerial photographs, using remote sensing, or using GPS or satellite images of the targeted terrestrial or marine area help programs obtain more accurate and meaningful data collection. Some rural communities use hand-drawn maps (i.e., community mapping) to identify places of interest and important community structures or points of interest or vulnerability.

Remote sensing has been increasingly used in environmental monitoring to understand changes to land



use, land cover, and growth in population and agricultural areas. While remote sensing can be more expensive than community mapping, if environmental and climate change outcomes and impacts are a high priority for the program, remote sensing or aerial photographs should be used to collect a baseline and possibly end line measurement. New and open-source technologies have become more readily available and user-friendly to the casual user of a geographic information system. Google Maps, Open Street Maps, and others can be used interactively to both view an area and create “digitized” areas on the map to use for monitoring habitats or populations. However, one should keep in mind that the open source software may not always offer high-definition views of the areas of interest and may not have the most updated imagery.

Leveraging expertise across sectors can be particularly useful to integrated programs in tracking the changes in outcomes geographically and over time. Mapping provides an opportunity to link the outcomes in environmental change with the changes in behaviors and knowledge of the community living in that habitat. In the past decade, the public health community has gained interest in spatial analysis and spatial statistics—a useful method for presenting changes in health outcomes.

PHE programs can take advantage of the public health community’s interest in spatially-related data and the environmental community’s vast expertise in spatial analysis. Researching other groups within your geographical areas of interest and seeing if they are using or planning to use any remote sensing or satellite imagery for similar purposes might allow your program to share or receive subsidized resources.

# Part 3: Implementing a Monitoring and Evaluation System



## MONITORING AND EVALUATION SYSTEM

An *M&E system* refers to all the tools, indicators, and processes that a project team will use to understand and measure a program's implementation. A robust M&E system includes both monitoring and evaluation.

An *M&E plan* is a detailed document explaining these tools, indicators, and processes.

An *M&E framework* shows how the project intends to achieve its goals and objectives.

# STEPS FOR DEVELOPING AND IMPLEMENTING A SYSTEM

## Step 1. Identify Stakeholders and Create an M&E Team

Just as a chain is only as strong as its weakest link, an M&E system is only as strong as the individuals who collect, analyze, and interpret the data and the people who use the information and help identify gaps in the data. By nature, a fully functional M&E system is only achieved through a participatory approach to system development and implementation. It requires consensus, capacity building, and human and financial investments. These aspects are especially important to integrated projects, for which implementers have diverse backgrounds and experience in M&E methods. The participatory approach and consensus-building activities include gathering stakeholders for group discussions on measurement goals, setting data quality standards, and making information transparent and available to all stakeholders. The Conservation Measures Partnership has identified the involvement of stakeholders—both internal and external—as a general principle in the project management cycle (Box 5).

### Box 5. Internal and External Stakeholders

Internal stakeholders include your project team (which can be as few as two people), composed of NGO staff, local stakeholders, researchers, or whomever else you find important to include.

External stakeholders include community members and other individuals and institutions that have some interest in and connection to the project.

In conducting your project, it is important at every step to make sure you involve the appropriate internal and external stakeholders in the proper manner (Conservation Measures Partnership, 2004).

### *Tips for Identifying Stakeholders*

Stakeholder identification should be a collaborative process with your internal team as well as external teams (if appropriate). Brainstorming with a whiteboard can be helpful not only to identify stakeholders but also to map out their levels of influence or decision making. Here are some questions you can use to identify your stakeholders:

1. Who is directly involved with the project?
2. Who is indirectly involved with the project?
3. Who may be affected by the project?
4. Who may be affected by the project's outcome?
5. Who gains or loses from the project's success?
6. Who is the user of the end result of the project?
7. Who has the authority to influence the project or its outcome?
8. Who has the authority to make the project succeed?

## Step 2. Create a Logic Model or M&E Framework

A logic model is a model that explicitly links all of the inputs, processes, outputs, and outcomes of the program or project in a linear way. An M&E framework is a similar framework, and the terms are often used interchangeably. Both models attempt to link the inputs and processes in a linear fashion to the outputs, outcomes, and impacts. Developing a logic model or M&E framework is the first key step in understanding and defining data and indicators to be used in the M&E plan. The four key pieces of a logic model are inputs, processes, outputs, and outcomes (Figure 1).

**Inputs** refer to human, financial, social, political, or other resources needed to begin and complete the program. Examples of inputs include hiring trained staff, developing and printing behavioral change communication materials, and providing technical assistance.

**Processes** refer to the activities programs carry out to achieve their objectives. Examples include distribution of family planning commodities, trainings, or educational events.

**Outputs** refer to the results of the efforts at the program level. In PHE, outputs refer to trainings, behavior change communication activities, delivery of selected health services, and completion of community-based NRM plans.

**Outcomes** refer to changes measured at the population and habitat levels. Examples include changes in the target population's knowledge and behaviors, and increased tree and wildlife species in the target habitat. Long-term outcomes also refer to coverage and disease prevalence.

### Large vs. Small Program M&E

When implementing M&E programs, large programs are likely to have many beneficiaries, program interventions, and geographic program areas. They are also likely to have larger budgets for M&E and may have more stringent M&E reporting requirements from funders. Smaller programs, in contrast, may have much simpler M&E requirements, reflecting their simpler project designs.

### Case Study of a Small PHE M&E Approach

To illustrate a smaller PHE M&E approach, we have taken the Duke Lemur Center's **SAVA Conservation** project in Madagascar as an example. This is a relatively small community-based project that aims to ultimately conserve the biodiversity of the SAVA region of Madagascar, especially the lemur population. The SAVA region was chosen because of its biodiversity as well as the continual threats caused by illegal logging, bushmeat hunting, and especially slash-and-burn agriculture. Thus, in terms of the "natural history" of this PHE project, it started with a conservation objective by a conservation organization (i.e., Duke Lemur Center) that realized the importance of changing the behavior of humans if biodiversity is to be conserved.

The project does only rudimentary M&E, mainly through program reports on activities conducted (e.g., school visits, cook stoves sold), although it reports activities to the Madagascar PHE Network. In this regard, however, the project could benefit from a simple M&E system that focuses on measuring the levels of activities. Below is a list of project activities, as well as proposed indicators<sup>3</sup> to measure them:

Environmental education includes structured visits to protected areas like Marojejy National Park or Macolline Nature Reserve for school students, training for schoolteachers and administrators, and distribution of training manuals.

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<sup>3</sup> In the process of developing this guide, MEASURE Evaluation made observational visits to existing PHE programs, including the SAVA Conservation project. Since SAVA does not have a formal M&E system, we proposed the indicators presented here.

*Proposed indicators:*

- # of course sessions conducted
- # of students reached by course sessions
- # of schoolteachers and administrators trained
- # of field visits completed
- # of students who completed field visits

Reforestation is another activity that the project supports in conjunction with the Belgian NGO “Graine de Vie.” This mostly consists of tree nurseries. Planting trees serves several purposes, as it provides a habitat for lemurs, prevents erosion, and provides livelihoods through trees that eventually have commercial value.

*Proposed indicators:*

- # of trees planted with project assistance (in reporting period)
- # of trees planted that have survived
- # of cook stoves sold
- # of households using stoves
- Estimated number of trees saved due to cook stove use

Fish farming and yam planting are also supported by the project. This is supposed to reduce the prevalence of bushmeat hunting and provide livelihoods. Also, since 25 percent of the fish that are harvested are supposed to be restocked in local rivers, fish farming directly supports biodiversity. In a similar vein, the project has started to support yam planting.

*Proposed indicators:*

- # of ponds operating
- # of fish harvested
- # of fish restocked in the wild
- Income generated from fish sales
- Hectares of yams planted
- kg of yams harvested

Cook stoves that do not use a lot of wood or charcoal are also sold by the project. They are procured from a Swiss NGO called ADES and are in high demand. They are sold locally by community organizations.

National parks are also supported in various ways on an ad hoc basis. For example, the project secured raincoats for park rangers with support from the U.S. Embassy and has helped with park boundary demarcation.

Family planning is also supported through collaboration with Marie Stopes. Duke pays the per diems and other associated costs of service providers to provide long-term methods such as implants and 12-year copper intrauterine devices (IUDs) in about seven villages.

*Proposed indicators:*

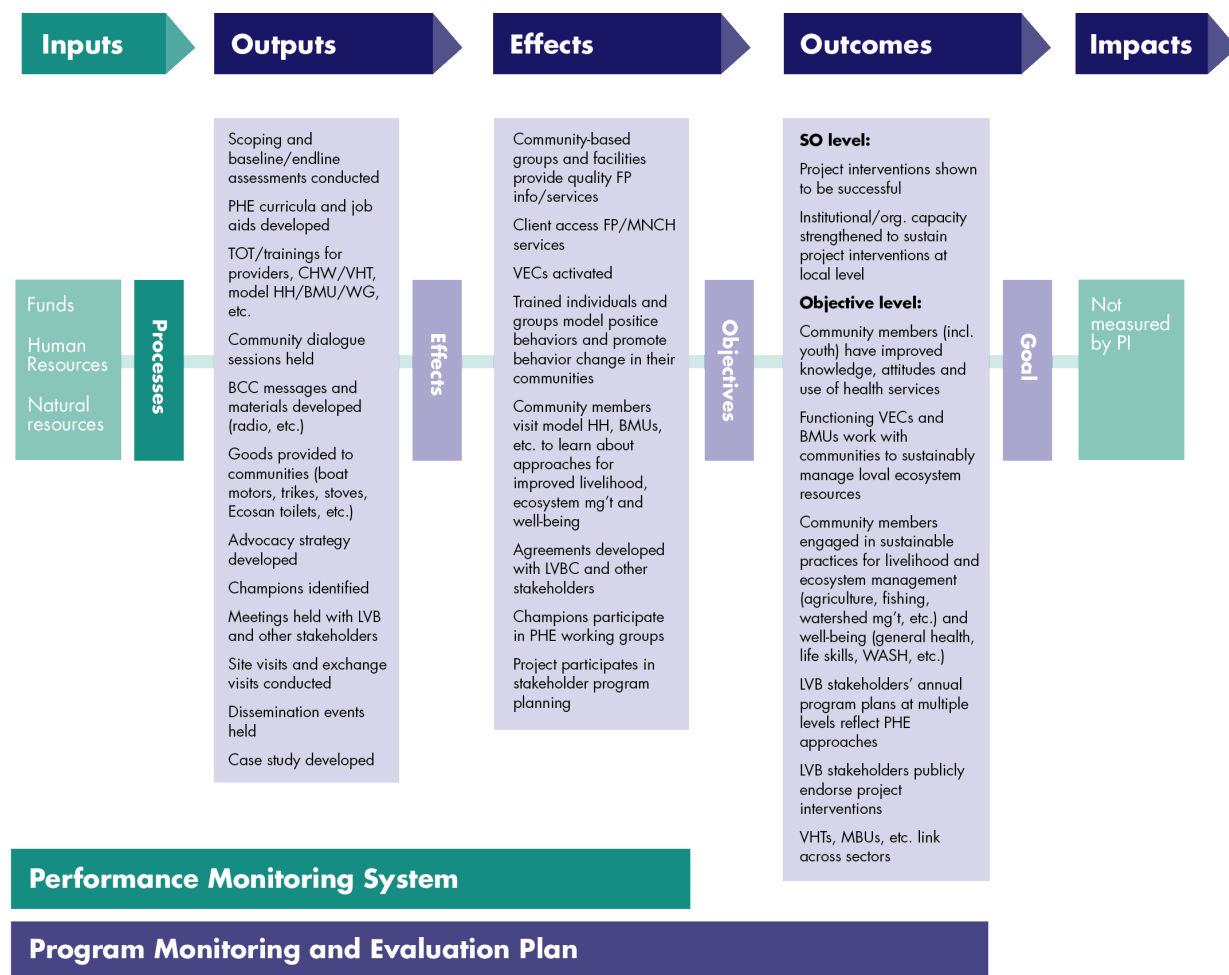
- # of new family planning acceptors attributed to the project
- # of CYP attributed to the project

## Case Study of a Large PHE M&E Approach

Here we will illustrate two large PHE projects—HOPE-LVB and TUUNGANE—that are examples of large, complex PHE projects with corresponding M&E programs. HOPE LVB, operating in several sites

in Uganda and Kenya on Lake Victoria, aims to improve biodiversity, especially of the fish population, while providing improved reproductive health, health, and livelihoods to its target populations. The HOPE LVB M&E framework includes inputs, outputs, effects (processes/activities), and outputs (Figure 3).

**Figure 3. HOPE LVB M&E framework**



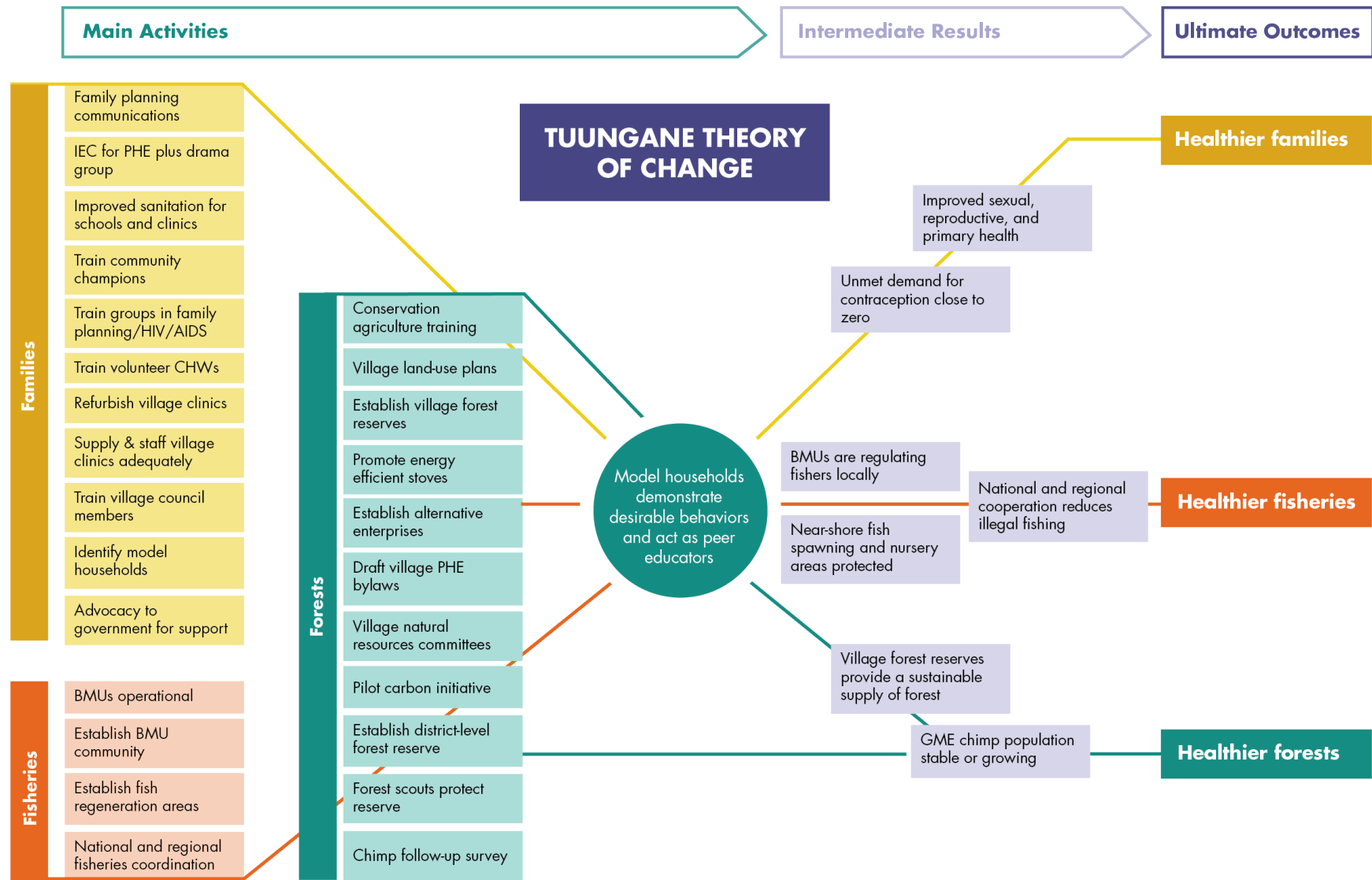
Source: HOPE LVB. Indicators are shown in the M&E logframe.

To develop a logic model, a program should work with internal and external stakeholders to review program documents with stated goals and objectives, identify key factors that may influence program implementation and success, and achieve consensus among stakeholders.

This discussion will set the stage for the M&E plan and ensure that all stakeholders have a clear and shared vision of the purpose, challenges, and project elements and goals for the M&E plan.

An alternative and sometimes complementary framework to the logic model is a theory of change. A theory of change essentially does the same as a logic model by linking inputs, outputs, and outcomes, but it does this in a more detailed manner and focuses on assumed causal pathways (Figure 4).

Figure 4. Tuungane Theory of Change

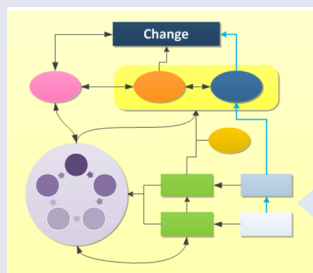




### Box 5. Models, Theories, and Frameworks, Oh My...

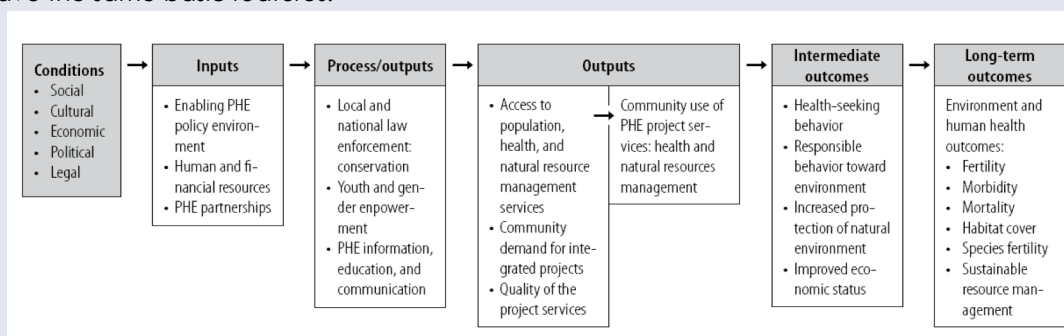
Numerous terms are used interchangeably throughout the M&E world and between disciplines. Here we briefly discuss the major differences among three main terms.

Theory of change or conceptual framework: A theory of change is a depiction of a “big picture” scenario of how a program intends to lead to a desired outcome or impact. It is often described using a diagram with non-linear pathways from one step to the next, is often unstructured, and can vary from one program to the next. Theories of change, or conceptual frameworks, often include external factors that are outside of the control of the program but have the potential to affect one or more program outcomes.



Source: Tools4dev.org

Logic model: A Logic model is a model to logically links inputs, processes, outputs, and outcomes in a linear fashion. It is a depiction of a “small-scale” or program-level understanding of how your program’s activities directly lead to outputs and outcomes and are linked directly to the overall goals and objectives of the program. There are many different templates for designing a logic model, but all have the same basic features.



Source: Finn, 2007

Logical framework: Also referred to as a logframe, this framework is similar to a logic model (and is often used interchangeably). However, it is shown in a matrix format that may or may not include additional information needs such as risks, assumptions, indicators, and frequency of reporting or collecting data.

	PROJECT SUMMARY	INDICATORS	MEANS OF VERIFICATION	RISKS/ASSUMPTIONS
Goal				
Outcomes				
Outputs				
Activities				

Source: Tools4dev.org, n.d.

### STEP 3. Identify Financial Resources: Resource Availability Mapping

The next step is to assess the available resources needed to implement the M&E plan. The M&E working group, in consultation with appropriate program authorities and donors, should develop **an M&E budget** to cover the costs of capacity-building activities, data collection and processing expenses, and human resources (Table 5). The general guidance is to allocate 10 percent to 20 percent of project funds to M&E activities.

An understanding of the resources available to implement an M&E system guides the processes of selecting indicators, developing instruments, collecting and analyzing data, and making data available for use. Institutional commitment through, for example, explicitly budgeting for M&E and having an M&E staff person for the M&E system ensures sustainability across time.

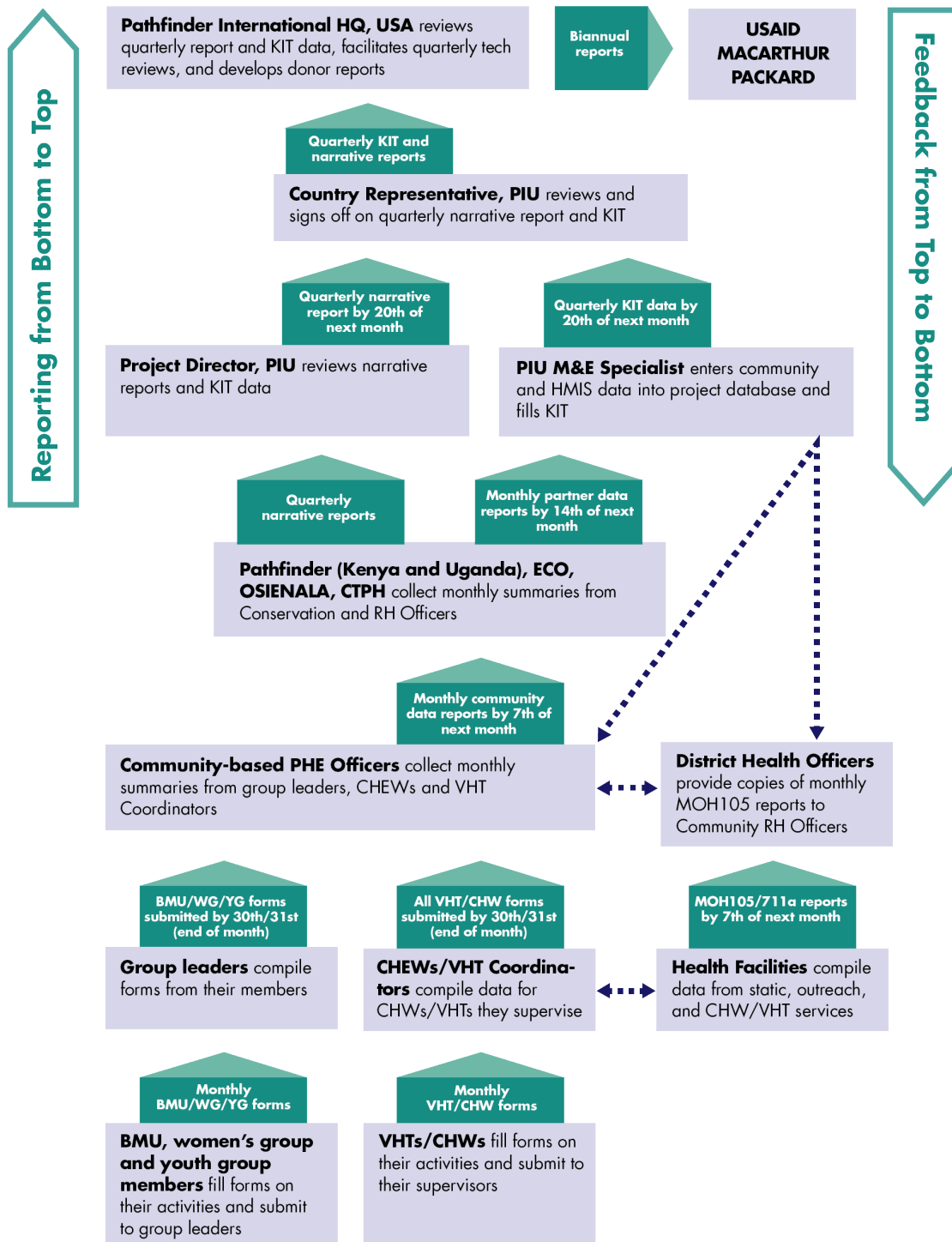
**Table 5. Illustrative monitoring and evaluation budget**

Activity	Amount in Dollars
Program manager time	\$x
Routine collection forms and duplication	\$x
Training staff in use of forms	\$x
Implementation of survey or special study	\$x
Special study consultant	\$x
Total estimated spending	\$x

### STEP 4. Identify Indicators, Methodological Approaches, and Data Sources

The next step is to revisit the M&E or logical framework and develop the list of project-appropriate indicators from those in this document. Here one compares that list with donor requirements, stakeholder requests, and information gaps. A core list of indicators based on the needs of all stakeholders is selected. Although donor indicators may not always be directly useful for local program improvements, they are essential for reporting to maintain the program's financial viability. Next, the available data sources from which to collect the necessary information should be reviewed. Then, you should consider if the same data sources can provide additional indicators that would serve more direct program needs. No program should attempt to collect information for all the indicators in this guide; rather, each program should have a subset of these indicators in its M&E plan. Additionally, a data flow diagram with reporting time lines should be outlined in order for all program staff to understand deadlines for reporting and how data will be aggregated for reports at various levels—national, regional, district, and local. Figure 5 shows an illustrative data flow diagram from the HOPE LVB program.

Figure 5. Data flow diagram, HOPE LBV program



Source: HOPE LVB

Next, develop a time line/calendar of reporting requirements (e.g., from donors, stakeholders) with data sources and specific dates. Such a calendar can map the programmatic decisions that need to be made over time (e.g., over a quarter, year, five years) with the data and information required to make those decisions. Finally, making a time frame or task schedule can be especially useful in keeping the participatory M&E plan development moving forward. A schedule of tasks to be achieved provides transparency, accountability, and adequate resource allocation over the life of the system cycle. Table 6 shows an example of a reporting schedule from the Tuungane project.

**Table 6. Sample Reporting Schedule, Tuungane Project**

Product Type	Frequency/Deadline	Responsible Party	Audience	Format
Tuungane quarterly report	Quarterly (21 <sup>st</sup> of the month following the end of the quarter)	Tuungane program manager	Project management, donors, community health management teams	Word document and indicator table
PMP progress report	Quarterly (15 <sup>th</sup> of the month following the end of the quarter)	M&E program officer	Project management, donors	Table in Excel
Project baseline survey report and presentation	2 months after baseline presentation	Principle investigator/ M&E directors with a consultant	Project management, local stakeholders, donors	Word document
Pathfinder donor-specific reports: 1. Barr Foundation 2. Johnson & Johnson 3. USAID (Evidence to Action E2A project)	<b>Every 6 months</b> (25 <sup>th</sup> of the month following the end of the quarter) <b>Every 6 months</b> (25 <sup>th</sup> of the month following the end of the quarter) <b>Quarterly</b> (15 <sup>th</sup> of the month following the end of the quarter)	Tuungane program manager	Donors	Word documents

## STEP 5. Develop an Implementation and Data Dissemination and Use Plan

Stakeholders should meet regularly, on either a monthly or quarterly basis if possible, to discuss data collection, any issues with data quality, and how that information has been or could be used. In the beginning stages, the M&E working group should develop a data use plan, identify barriers to data use, and create an information flow map to illustrate how data can be interpreted to make informed decisions. This meeting requires a clear understanding of what questions the indicators were selected to answer and how those answers can be applied to the program’s protocol.

The ultimate purpose of M&E is to provide information that is used. Preparing for data use on a continuous basis assures that information is used to make informed decisions. This process also helps the group think strategically about different users’ needs, what data to collect, and exactly how data can be used.

## STEP 6. Compile and Write the M&E Plan

Drawing from the information gathered from all the previous sessions, draft an M&E plan that explicitly states all the material covered (Table 7). The following are examples of sections to include:

- Introduction, including general project design, goals, and objectives
- Purpose of the M&E plan
- Critical assumptions
- Frameworks (e.g., conceptual, logical, theory of change, result chains, strategic)

- Indicators, including definition and sources
- Data sources and data collection
- Evaluations/special studies (e.g., types and uses of evaluation bias, how information from evaluations relates to the regular monitoring, sampling, and reference sources of evaluations)
- Data use plans/reporting cycles, including time lines and M&E system review meetings
- A plan to monitor the system itself and evaluate its effectiveness

**Table 7. Example of an M&E plan**

Tuungane M&E Task List																	
No.	Activity	2014				2015				2016				Lead Person	Responsible persons	Output	
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Objective 1: Establish M&E System for Tuungane Project																	
2	Develop and finalize draft M&E system (Framework and Operational plan and tools)	X	X	X	X						X	X			M&E director		M&E plan and PMP
3	Revise/ Update M&E M&E system and tools					X					X				M&E Director		Final tools
4	Developing Tuungane database											X	X		M&E director		Database in place
5	Training Tuungane program staff on M&E system				X	X						X	X		M&E director/ M&E program officer		Tuungane staff trained on M&E system

The M&E plan guides everyone involved in project monitoring. All participants should be held to the same set of indicators, definitions, and time lines. Also, roles and responsibilities should be clearly defined. The uses of data should be clearly outlined, and data that do not have a clearly defined use should not be collected. The M&E plan serves as an agreement among stakeholders and a resource that provides clarity and transparency to the entire process.

## **STEP 7. Implement the M&E Plan**

Several steps are required for implementing the M&E plan, including developing the data collection tools, identifying all data sources, collecting the data, verifying the data, compiling reports, and disseminating data.

## **STEP 8. Identify All Data Sources**

The first step in implementing the M&E plan and beginning data collection is to identify all the data sources for collecting your data. In developing the M&E framework and choosing the indicators for your M&E activities, you should discuss the availability of, reliability of, and access to different data sources to collect your indicators. Health facility records, as one example, can be a very useful source of information for collecting your indicator data, but you should be sure that you have all the necessary permissions to collect them on a regular basis.

## **STEP 9. Develop the Data Collection Tools**

The next step is to develop the data collection tools. Reliable, standardized, easy-to-use, and efficient data collection tools are key to making sure the data you collect will accurately report on your program's indicators. The type of data collection tools you need to develop will depend on the type of information that you need to collect.

Using your indicator reference sheets or indicator matrix, plot out a list of questions you need to ask or information you need to observe to collect the data for the indicator, keeping in mind language and cultural appropriateness. Parse these questions out into different forms depending on the source of information, the frequency of reporting, and the type of data collected. For example, you may need to collect health indicators from health facilities on a monthly or quarterly basis to report on your indicators. Look at the questions and understand who you will need to interview to collect that information:

- Will you need to interview staff members?
- Will you need to look at health facility records?

Make sure to organize this information into one or more data collection forms to ensure it is easily understood by the data collector, and to reduce the burden on both the data collector and the respondent.

The final step in developing the data collection tools is to pretest the instruments and then revise them before using them in the field. By pretesting the questions and the tools, you will be able to better understand if the questions are appropriate for gathering the desired information, if the language is appropriate and clear, if the tool is too long or tedious, and if variations in the responses need to be clarified. Try to pretest the data collection tools on at least 5–10 people or institutions. You should revise your data collection tools based on the feedback from the enumerators and data points that were collected during the pretest and incorporate them into your final versions.

## **STEP 10. Collect the Data**

Steps involved in collecting your data depend on the type of data that will be collected, the source of the data or information, and the frequency of data collection. Most commonly, programs will use a combination of observations, interviews, focus groups, service statistics, health facility records, registers, or secondary data sources.

## **STEP 11. Verify the Data**

In addition to collecting high-quality data during the previous steps, data verification and validation are

important steps to make sure your data are accurate, valid, and consistent. Programs rely on accurate data to understand the outcomes and impacts of their interventions. Collecting data through pen and paper or through an electronic method both provide room for human errors.

Data validation helps to understand if the data you have collected are accurate. Data validation methods for the collection of **quantitative data** include data quality assessments/audits or lot quality assurance sampling, in which primary data sources (e.g., registers) are collected and checked against data collected and reported on in aggregated reports (Box 7). An example of a health indicator for a data quality audit could be “number of children presenting at health facility Y with diarrheal diseases over the past X weeks.” First, primary case management records and registers would be collected. The number of case reports would be counted and checked with the health register, and that count would then be matched up to the data recorded in a monthly aggregated report. Most programs aim to verify at least 10 percent of data on an ongoing basis.

### **Box 7. Data Quality Audits**

An outside evaluator should audit data on a periodic basis. The following steps can serve as a guideline for auditing data elements.

1. Observation: Observe or describe the connection between the delivery of services or commodities and the completion of the source document that records that service delivery.
2. Documentation review: Review availability and completeness of all indicator source documents for the selected reporting period.
3. Trace and verify reported numbers:
  - Recount the reported numbers from available source documents.
  - Compare the verified numbers to the site-reported numbers.
  - Identify reasons for any differences.
4. Cross-checks: Cross-check the verified report totals with other data sources (e.g., inventory records, laboratory reports).
5. Spot-checks: Spot-check data to verify that services or commodities are delivered to the target populations.

Data verification methods for **qualitative data** most commonly include triangulation and “member checking.” Triangulation refers to using more than one method to collect the information of interest and to answer the research question. This is a method of “internal validity” that can be built into your M&E plan. A program can either use two qualitative data collection methods, such as focus groups and observations, or use a mixed-method approach in which quantitative data can complement or “validate” the qualitative data collected. Member checking refers to taking the results of the data collected and reporting back to those who provided the information to get their feedback on the validity of the data.

## **STEP 12. Analyze the Data and Compile Reports**

The next step after collecting and verifying your data is to analyze them and compile reports. The type of analysis you will need to do depends on the type of data you have collected and the methods you are using for monitoring or evaluation. Many of the indicators within this guide are simple to collect and capture, as the main purpose of this guide was to create a useable field manual for programs without substantial M&E backgrounds.

The most typical type of analysis for quantitative monitoring data is data aggregation for the development of counts, percentages, and rates. In large population-based surveys or evaluations, your analysis may consist of creating frequencies, crosstabs, dispersions, trends, and correlations. Qualitative data are most often analyzed through content analysis approaches.

Data that were collected and analyzed should be reported on an ongoing basis and at various levels of the organization. Donor requirements vary from quarterly reports on specific indicators to only an end line report, but most donors fall somewhere in the middle, requiring yearly reports on progress toward goals and objectives. While reporting is most often utilized for donor agencies, it can also be used to provide feedback to field staff who are running programs and collecting primary data. Field staff are often the most important consumers of these data, as they can use them to make decisions and improve programing. Different audiences require and appreciate different reports, so keep in mind what the data in the reports will look like and who the ultimate consumers will be; a report that will be used to advocate for more funds will likely look different than one for CHWs providing a health intervention.

### **STEP 13. Use the Data to Make Decisions and Review the M&E Plan**

M&E should promote a process of using information. The M&E plan is a living document that is only useful if it reflects project implementation and reporting needs. Data should be used to adapt the project accordingly; regular monitoring can lead to the necessity to develop special studies and evaluations to answer implementation questions. Additionally, data can be used periodically to make midcourse corrections to program implementation, such as providing more funds for an activity (e.g., a training or workshop) that has a higher demand than expected, to replace an activity that is not working, or to create more culturally appropriate IEC materials.

The M&E working group should periodically review the plan and update it based on the successes and shortfalls of system performance. Monitoring and evaluating a project should allow users to see operational problems and program designs that need correction. The group should solicit feedback from data gatherers, processors, and information users. The group should also communicate with project staff and stakeholders about how data can be used to inform the direction of project implementation.



# Part 4: Evaluating Complex Programs



## COMPLEX PROGRAMS

PHE programs often include many types of stakeholders and cover several contextual areas. They are often developed and executed within dynamic communities using integrated program models. Using only traditional methods for evaluating a program is often time-consuming, expensive, and insufficient in describing all the complex interactions between actors and outcomes. Often, PHE programs have nonlinear or unknown outcomes or involve multidirectional pathways toward intended or unintended outcomes. These programs are often referred to as “complex” (Preskill, 2014) and require innovative ways of evaluating their outcomes and impacts.

Many PHE programs include the implementation of integrated programs that were historically siloed. Many PHE practitioners not only find these complex programs difficult to measure, but also find that more traditional evaluations, such as experimental designs, are often not comprehensive enough to capture all the intended and unintended outcomes and impacts of PHE programs. There is an emerging interest and discipline in methods of evaluating the outcomes and impacts of complex programs. Four of these evaluation methods are outlined in brief, below.

## EVALUATION METHODS

### Contribution Analysis

Most often, the reasons for conducting an impact or outcome assessment or evaluation is to provide answers about the efficacy and efficiency of a program: Does it work? To what extent are the outcomes we see related to the intervention or program? Contribution analysis, a theory-based evaluation method, provides a different option for exploring these questions when a traditional experimental or quasi-experimental design is not possible, feasible, or desired (Mayne, 2001) (Box 8). National or population-level impacts or long-term outcomes, such as behavior change, often cannot be understood or quantified for many years after the intervention, yet many donors and beneficiaries are eager to understand how the program is or is not meeting its intended objectives. Contribution analysis attempts to provide clear pathways from inputs to outcomes and provides information on whether a program is likely to produce the intended impacts.

Mayne theorized that this method could be utilized to “address attribution through performance measurement” (Mayne, 1999). In contribution analysis, using a well-developed theory of change along with an assessment of all alternative or counterfactual theories for the outcome, one can create a “performance story” that can relatively assess a plausible attribution (Kotvojs & Shrimpton, 2007). Mayne suggests the main steps to carry out a contribution analysis:

- Develop a program logic/theory of change that clearly outlines the suspected association between inputs, processes, and outcomes.
- Seek evidence for why the outcomes and outputs could exist within your theory of change.
- Seek all alternate explanations (i.e., counterfactuals) that could explain the program logic and could contribute to the program outputs and outcomes, making sure to include all outside actors or influences.
- Gather any existing evidence on your prescribed theory of change.

### Box 8. Contribution Analysis

“[Contribution analysis] is based on the existence of, or more usually, the development of a postulated theory of change for the intervention being examined. The analysis examines and tests this theory against logic and the evidence available from results observed and the various assumptions behind the theory of change, and examines other influencing factors.”

—Mayne, 2008

- Create a “performance story” that explains why your assumption is likely and how the inputs and processes have created the outputs and outcomes.
- Strengthen this story with alternative and additional evidence as needed or possible.
- Revise and disseminate (Mayne, 2012).

What makes contribution analysis unique is that it focuses on attribution of the intervention, and more actively seeks out counterfactuals during the process to help strengthen and validate the attribution. While many donors require information on outcomes or impacts, most often they also require data on inputs, processes, and outputs, which this method does not readily capture. Contribution analysis should be used in conjunction with monitoring data to ensure a complete picture of program performance.

## **Most Significant Change**

The most significant change (MSC) method, while not entirely new, has more recently gained traction as a valid and rigorous qualitative evaluation technique. The technique was developed by Rick Davies in the 1990s to help evaluate a rather complex rural program in Bangladesh. Rather than focusing on measuring precise inputs, processes, and outputs, this method focuses on outcomes and impacts. The MSC method is highly participatory in nature in that stakeholders themselves are involved in data collection, analysis, and sometimes dissemination. Additionally, it is a purely qualitative technique that does not employ any quantitative data or methods. This technique can be used as a monitoring tool as well as an evaluation tool depending on the frequency it is utilized and the depth of analysis completed. The MSC method involves, at its core, stakeholders deciding what the most significant change has been on outcome- and impact-level indicators (either predefined or not defined) in a participatory manner to encourage open exchange, dialogue, and consensus building. One of the most substantial added values of the MSC method is that it often can uncover important outcomes and impacts (both positive and negative) that may never have been thought of or envisioned before implementation.

The MSC method involves several iterative steps:

- Establish “domains of change” to explore.
- Set parameters on dates, times, and contexts for reports/stories.
- Collect data/stories from stakeholders and beneficiaries.
- Review, synthesize, and collate the stories.
- Validate and verify the stories and provide feedback to stakeholders on the stories that have been gathered.
- Conduct a “secondary analysis” of the collected stories and data to identify emergent themes and counterfactuals.
- Revise and disseminate.
- Use the data for program improvement or evidence-based decision making.

MSC stories of change are gathered from a few to many stakeholders depending on the time or logistical constraints and breadth of the evaluation. These stories are then validated by a small group of stakeholders to define the most significant changes of the program. While most of the MSC approach is of a qualitative nature, the qualitative data can be triangulated with quantitative monitoring data of inputs, outputs, and processes to provide a more robust picture of a program’s impacts (Serrat, 2009).

## Outcome Harvesting

Outcome harvesting is defined as the identification, formulation, analysis, and interpretation of outcomes to answer useful questions (Wilson-Grau, 2013). This method first collects evidence of what has been achieved and then works backwards to determine whether and how the project contributed to the change, rather than measuring progress toward predetermined outcomes or objectives (as other evaluation methods do). Outcome harvesting is a fairly new approach to understanding complex programs, projects, and policies that aim to capture outcome-level indicators as well as the theories of change that contributed to the outcomes. This method involves six major iterative steps:

- Stakeholders identify useful questions that will help guide the process of the harvest.
- Through various primary and secondary sources, the “harvester” will gather data (e.g., through interviews, data sources, observations) to understand what changes have occurred due to the “intervention” or “program” and why beneficiaries feel those changes occurred.
- The “harvester” creates outcomes descriptions, based on the information gathered during steps 1 and 2, with the program stakeholders.
- The information is validated.
- The data are analyzed and interpreted.
- Information is disseminated and used for evidence-based programming (Wilson-Grau, 2013).

The information collected during this process is validated by other independent stakeholders at the individual and group levels to understand questions around the program outcomes and impacts, such as “What happened in this program?” and “Why is it important?” This method is particularly useful to understand how individual-level outcomes affect broader system-wide changes and impacts. Outcome harvesting is well suited for understanding complex relationships and undefined or unknown outcomes and causal effects. Like the other emergent evaluation methods described here, this method is more useful for understanding outcomes than it is for understanding inputs, processes, and outputs. For this reason, outcome harvesting should be used in conjunction with quantitative or mixed-method approaches of monitoring to gather information. Additionally, outcome harvesting can be used as a monitoring tool, an evaluation tool, or both depending on how frequently it is used.

## Participatory Evaluation

In addition to including field-based teams and other internal stakeholders in participatory planning and data collection methods, there are several methods for integrating external stakeholders in the M&E data collection and analysis process. Participatory evaluation is a broader term and method than those described above and includes many qualitative participatory methods such as social and community mapping, scoring and ranking, storytelling, social network analysis, and diagramming. Many of these innovative and emerging qualitative approaches have been borrowed from other disciplines and found to be useful for monitoring and evaluating complex, integrated programs such as PHE. However, participatory evaluation can also be used to collect quantitative data through the participatory practice of designing surveys, collecting data, and consensus building around results and analysis. Increasingly, program beneficiaries and the communities in which they live are included in the entire programming process, beginning with program inception and ending with data dissemination and use.

Participatory evaluation is also useful for analysis and dissemination in that beneficiaries of the program/intervention, community members, and other stakeholders can assist in validating key findings and in finding culturally appropriate ways to disseminate and present key findings relevant to and appropriate for different audiences.

# Part 5: Indicators



# USING INDICATORS TO MONITOR AND EVALUATE PHE PROGRAMS

As mentioned in the beginning of this guide, the list of indicators outlined in this section is meant to be illustrative. The indicators on the list can be used by a program to understand progress toward its intended goals and objectives (i.e., monitoring) as well as to understand the program's outcomes or impacts on the beneficiaries or program area (i.e., evaluation). The indicators attempt to cover a broad range of potential program areas and activities, though your program should modify them as needed to best fit its activities, goals, and objectives and should apply them only if applicable.

Whenever possible, women should be targeted for these programs and disaggregated within these indicators. The indicators aim to cover those that are commonly used (and therefore field and program vetted) as well as those that are realistic to capture. Although the size of PHE programs ranges from small non-profits with minimal activities to large multi-donor and multi-country initiatives, we attempted to create and use those indicators that would reduce the human resource burden and, when possible, the monetary and time burdens to increase their utility.

The sustainable development goals were created and ratified in 2015 by the United Nations and all member countries. The indicators within this guide and the PHE programs this guide is written for focus on and relate to several of these goals, including those related to women (Box 9).

In this section, you will first find an introduction to each PHE contextual area— Population, Health, Environment, Livelihoods, and Integration. Each introduction will explain what types of indicators are included and why. Additionally, commonly used indicators are referenced in a matrix within the introduction. The matrix will show you which of the indicators are being used by the large HOPE LVB and Tuungane projects.

Following the introduction will be the indicators and the indicator reference sheets. Each reference sheet will outline a description and definition of the indicator to be collected, the type of indicator it is (e.g., input, output, outcome), how to calculate the indicator, how and when to disaggregate it if necessary or desired, the purpose and relevancy of collecting the indicator, a list of potential data sources for capturing the data needed for the indicator, how often to collect the indicator, any special considerations for collecting the indicator, and the indicator's strengths and limitations.

These reference sheets should be used as a guide to develop your own program's indicators, keeping in mind that there may be several ways to phrase or define your indicator. For example, an indicator included in this guide might capture a percentage, and one program may not have access to a denominator so instead may decide to just report a count of the indicator.

### **Box 9. Women and Sustainable Development**

"The deterioration of natural resources displaces communities, especially women, from income-generating activities while greatly adding to unremunerated work. In both urban and rural areas, environmental degradation results in negative effects on the health, well-being, and quality of life of the population at large, especially girls and women of all ages. Particular attention and recognition should be given to the role and special situation of women living in rural areas and those working in the agricultural sector, where access to training, land, natural and productive resources, credit, development programmes, and cooperative structures can help them increase their participation in sustainable development...Through their management and use of natural resources, women provide sustenance to their families and communities. As consumers and producers, caretakers of their families and educators, women play an important role in promoting sustainable development through their concern for the quality and sustainability of life for present and future generations..."

Women remain largely absent at all levels of policy formulation and decision making in natural resource and environmental management, conservation, protection, and rehabilitation, and their experience and skills in advocacy for and monitoring of proper natural resource management too often remain marginalized in policymaking and decision-making bodies, as well as in educational institutions and environment-related agencies at the managerial level. Women are rarely trained as professional natural resource managers with policymaking capacities, such as land-use planners, agriculturalists, foresters, marine scientists, and environmental lawyers. Even in cases where women are trained as professional natural resource managers, they are often underrepresented in formal institutions with policy-making capacities at the national, regional, and international levels...

Women, especially indigenous women, have particular knowledge of ecological linkages and fragile ecosystem management. Women in many communities provide the main labour force for subsistence production, including production of seafood; hence, their role is crucial to the provision of food and nutrition, the enhancement of the subsistence and informal sectors, and the preservation of the environment. In certain regions, women are generally the most stable members of the community, as men often pursue work in distant locations, leaving women to safeguard the natural environment and ensure adequate and sustainable resource allocation within the household and the community...

*Sustainable development will be an elusive goal unless women's contribution to environmental management is recognized and supported"*

--Report of the Fourth World Conference on Women, Beijing, China (United Nations, 1995)

## POPULATION INDICATORS

Population-sector activities within PHE programs aim to improve and sustain voluntary family planning and reproductive health services and use. Population programs need to collect and assess information about two broad, sometimes overlapping areas: health facilities and relevant populations. The first area is important because facility quality and staff training, access, and population use of health facilities all strongly influence the overall health of a population. Population programs assess not only a population’s physical health but also the population’s knowledge, attitudes, and practices around a specific health issue. Such programs also promote gender equality and male inclusion in discussions about contraception. An area of improving and sustaining voluntary family planning and reproductive health services that is particularly relevant to PHE programs’ work is a focus on providing access to underserved communities. Many indicators in this section may be valuable for population-sector M&E; however, programs that have a focus or that face limited budgets should concentrate on measuring indicators that best fit their needs. Table 8 lists the most common indicators from the HOPE LVB and Tuungane projects.

**Table 8. Commonly Collected Population Indicators**

Indicator	HOPE LVB	Tuungane
Contraceptive prevalence rate	X	
Percentage of deliveries occurring in a health facility	X	X
Number of acceptors new to modern contraception	X	
Percentage of women of reproductive age (15–49 years) who were clients of a community-based distributor in the past year	X	X
CYP	X	
Percentage of women who attended at least four antenatal care visits during pregnancy	X	X
Number of adults who have been referred for family planning services by PHE staff	X	X
Percentage of skilled health personnel knowledgeable in obstetric warning signs		X
Percentage of births attended by skilled health personnel		X



## PERCENTAGE OF PROGRAM STAFF TRAINED TO WORK WITH OR PROVIDE REPRODUCTIVE HEALTH SERVICES TO ADOLESCENTS

LEVEL OF MEASUREMENT: Output.

DEFINITION: Staff members are considered “youth-friendly” if they have the ability to provide services and an environment that targets young audiences. Youth-friendly training generally includes learning how to create a service environment that will attract and retain a youth clientele. This includes space or rooms dedicated to adolescent reproductive health services; staff who are competent in policies and procedures to ensure privacy and confidentiality; peer educators who stay on-site during hours specified for provision of services to youth, use non-judgmental approaches to providing services to youth, and accept drop-in clients. A staff member would need to go through specific training for working with youth to be counted in this indicator. The denominator should include all staff who work in the target area during the reference period (i.e., semi-annually or annually)—even staff who work part-time.

CALCULATION:

$\frac{\text{\# of program staff trained to work with or provide reproductive health services to adolescents during the reference period}}{\text{Total \# of health service providers in the target area during the reference period}} \times 100$
--

DISAGGREGATION: None.

PURPOSE: Reproductive health services have traditionally been designed for older, married women. Increasing the number of health providers trained to work with youth may increase the chance that youth will take advantage of the basic reproductive health services they need.

DATA SOURCES: Project records.

TIME FRAME: Semi-annually, annually.

DATA COLLECTION CONSIDERATIONS: Specific topics related to adolescent reproductive health, such as sexual health education and peer dynamics, should be covered in the training. Use of a pre- and posttest will assist in determining the staff’s level of understanding.

STRENGTHS & LIMITATIONS: This indicator targets service improvement for an audience that has a strong, often unmet need for reproductive health services. However, training does not indicate whether providers give adequate care.

## PERCENTAGE OF MEN AND WOMEN WHO KNOW WHERE TO ACCESS MODERN FAMILY PLANNING SERVICES

LEVEL OF MEASUREMENT: Output.

DEFINITION: Modern family planning methods refer to the following: pills, IUDs, Norplant implants, injections, condoms, spermicides, diaphragms, and sterilization (i.e., tubal ligation, vasectomy).

CALCULATION:

$$\frac{\text{\# of adults ages 15–49 who know where to access modern family planning services}}{\text{Total \# of adults ages 15–49 in the target area}} \times 100$$

DISAGGREGATION: By men/women.

PURPOSE: This indicator provides program managers with a basis for assessing whether promotional or awareness-raising activities are required to educate men and women on where they can obtain modern family planning methods. This indicator also provides information on gender differences in knowledge of where to obtain family planning methods.

DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years.

DATA COLLECTION CONSIDERATIONS: Without prompting, adults should be asked to name a location where they can obtain family planning. For this indicator to have meaning, both men and women should be surveyed.

STRENGTHS & LIMITATIONS: Asking respondents to name a specific location prevents them from giving false affirmative answers to please the interviewer. However, this indicator does not measure knowledge or use of family planning services.

## PERCENTAGE OF YOUTH WHO USED A CONDOM AT LAST HIGH-RISK SEX IN THE PREVIOUS YEAR



**LEVEL OF MEASUREMENT:** Outcome.

**DEFINITION:** This indicator measures the percentage of youth ages 15–24 who used a condom the last time they had high-risk sex. High-risk sex is defined as sex with any nonmarital, non-cohabitating partner. This indicator relates to sexual activity within the previous 12 months

**CALCULATION:**

$$\frac{\text{\# of sexually active youth ages 15–24 who used a condom the last time they had high-risk sex in the past 12 months}}{\text{Total \# of youth ages 15–24 who report having high-risk sex in the past 12 months}} \times 100$$

**DISAGGREGATION:** By age group (e.g., 15–19, 20–24), sex.

**PURPOSE:** Consistent and correct condom use has been shown to reduce the risk of HIV and other sexually transmitted infections and to prevent unintended pregnancy. Increasing condom use with nonmarital, non-cohabitating partners is a goal of many reproductive health programs, including those aimed at youth. PHE programs frequently sell condoms or promote their use through social marketing campaigns; this indicator can be used to assess both men’s and women’s adoption of these messages.

**DATA SOURCE:** Population-based surveys.

**TIME FRAME:** Every two to five years.

**DATA COLLECTION CONSIDERATIONS:** This indicator measures condom use in high-risk sexual activity among both married and unmarried youth within the past 12 months. The target area or region for both the numerator and denominator should be the same. The target area should be defined in advance and remain constant over the course of the project for consistent comparison over time. Collection of these data requires gathering sexual histories from several previous partners (i.e., asking about condom use with the last three sexual partners within the previous year).

**STRENGTHS & LIMITATIONS:** Measuring condom use among the last three sexual partners within the past year reduces recall bias. Questions about condom use and sexual activity are taboo for some audiences, particularly youth in many cultures, and this may lead to reporting bias. Youth may underreport their sexual behaviors, especially high-risk behaviors. Additionally, condom use at last sex does not measure either consistent or correct use of condoms.

## PERCENTAGE OF ADULTS WHO USED A CONDOM AT LAST HIGH-RISK SEX IN THE PREVIOUS YEAR

LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator measures the percentage of men and women, ages 15–49, who used a condom the last time they had high-risk sex. High-risk sex is defined as sex with any nonmarital, non-cohabitating partner. This indicator measures sexual activity within the previous 12 months.

CALCULATION:

$$\frac{\text{\# of sexually active men/women ages 15–49 who used a condom the last time they had high-risk sex in the past 12 months}}{\text{Total \# of men/women ages 15–49 who report having high-risk sex in the past 12 months}} \times 100$$

DISAGGREGATION: By age group, sex

PURPOSE: Consistent and correct condom use has been shown to reduce the risk of HIV and other sexually transmitted infections and to prevent unintended pregnancy. Increasing condom use with nonmarital, non-cohabiting partners is an important component of programs aimed at reducing HIV infections among sexually active adults, both married and unmarried. PHE programs frequently sell condoms or promote their use through social marketing campaigns; this indicator can be used to assess both men’s and women’s adoption of these messages.

DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years.

DATA COLLECTION CONSIDERATIONS: This indicator measures high-risk sexual activity among married and unmarried men and women within the past 12 months. The target area or region for both the numerator and denominator should be the same. The target area should be defined in advance and remain constant over the course of the project for consistent comparison over time. Collection of these data requires gathering sexual histories from several previous partners (i.e., asking about condom use with the last three sexual partners within the previous year).

STRENGTHS & LIMITATIONS: Measuring condom use among the last three sexual partners within the past year reduces recall bias. Although condom use within marriage may be low, this indicator aims to measure condom use outside of formalized unions. However, questions about condom use and sexual activity are taboo for some audiences, and this may lead to reporting bias. Additionally, condom use at last sex does not measure either consistent or correct use of condoms.

## PERCENTAGE OF MEN WHO SUPPORT USE OF MODERN CONTRACEPTION FOR THEMSELVES OR THEIR PARTNERS



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: Support for modern contraception can be defined as a man’s acceptance of, communication about, or practice of any modern method (i.e., condoms, pills, injections, implants, IUDs, diaphragms, spermicides, male or female sterilization) to delay or prevent pregnancy with his partner. Men’s supportive attitudes can be ascertained by asking men questions about their attitudes (e.g., Do you approve or disapprove of your wife or partner’s use of a contraceptive method to prevent pregnancy?), communication with their partner (e.g., Have you ever told or otherwise let your wife or partner know that you approve or disapprove of her using contraception?), or practices (e.g., Do you currently use any form of contraceptive to delay or prevent pregnancy?). For this indicator, partner is defined as within a marital or cohabitating union.

CALCULATION:

$$\frac{\text{\# of men ages 15–49 who support modern contraceptive use by themselves or their partners}}{\text{Total \# of men ages 15–49 surveyed}} \times 100$$

DISAGGREGATION: None.

PURPOSE: In many developing countries, men either are not involved in reproductive health decision making or have negative attitudes toward contraceptive use. These negative attitudes result in more unplanned pregnancies and can increase transmission of HIV and other sexually transmitted infections. More supportive attitudes can have the opposite effect, especially if coupled with improved communication and consistent practice.

DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years.

DATA COLLECTION CONSIDERATIONS: Support can be determined in multiple ways depending on the specific aims of the program. Determining attitudes and beliefs is tricky, and reporting bias is possible. Asking these questions in a matter-of-fact manner can reduce the chance of reporting bias and increase the accuracy of results. Men’s attitudes for this indicator could be determined using structured interviews or surveys in the general population. Alternatively, although asking men about their own attitudes is preferable, women can also be asked about a partner’s attitudes and beliefs. Women who use family planning methods may be asked whether a partner/spouse is aware of their use.

For these data to be valid, the questions need to be measured the same way for the same population so that comparisons can be made across time.

STRENGTHS & LIMITATIONS: PHE programs often work on gender issues, especially to include men in the counseling and decision-making process for contraceptive use. However, answers to these questions are subject to reporting bias, especially for men who believe their attitudes deviate from socially held or interviewer beliefs. Additionally, this is an indicator of modern contraceptive use to delay or prevent pregnancy, not for protection against sexually transmitted infections, including HIV. Caution must be used to determine the motivation for the contraceptive use, especially for condoms. Lastly, support for use of modern contraceptives is not an indicator of consistent or correct use.

## **NUMBER OF ADULTS WHO HAVE BEEN REFERRED FOR FAMILY PLANNING SERVICES BY PHE STAFF**

LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator captures men and women ages 15–49 who have been referred to a health facility for family planning services by a program PHE staff member or volunteer (i.e., village health team, CHW, BMU).

CALCULATION: None.

DISAGGREGATION: By age, sex.

PURPOSE: This indicator captures successful integration of the PHE program by collecting referral information specifically for family planning services. Successful referrals to the health facility for family planning information and services (i.e., contraception) can show PHE messaging is informative and useful.

DATA SOURCES: Service statistics, project records.

TIME FRAME: Quarterly or annually.

DATA COLLECTION CONSIDERATIONS: This indicator is relatively easy to capture. However, it is important to measure whether the adult referred is a new client or a returning client. It is more desirable for the program to refer new clients to the health facility for family planning services.

STRENGTHS & LIMITATIONS: This indicator does not specifically capture successful or completed referrals for the new client. However, a program can easily capture this information if it is deemed necessary or particularly important for the program. Trends in this indicator can be tracked to find particularly successful messaging from PHE staff or volunteers.

## PERCENTAGE OF WOMEN OF REPRODUCTIVE AGE (15–49 YEARS) WHO WERE CLIENTS OF A COMMUNITY-BASED CONTRACEPTIVE DISTRIBUTOR IN THE PAST YEAR

LEVEL OF MEASUREMENT: Output.

DEFINITION: This indicator measures how well community-based distribution (CBD) of contraception provides coverage of family planning services to an area. In the context of PHE programs, CBD means that the contraceptives are sold at a point that is not a traditional health facility, such as a clinic or hospital. CBD is generally through a local store, commercial site, an individual at a noncommercial site, or other community-based variations. As measured in this indicator, a client is a woman who receives contraception from a community-based distributor, but this does not include a woman who only talks with the distributor about contraceptive methods. The methods of contraception that clients use include any modern or traditional methods.

CALCULATION:

$$\frac{\text{Total \# of female clients, ages 15–49, of community-based distributors in the target area in the past year}}{\text{Total \# of women ages 15–49 living in the target area in the past year}} \times 100$$

DISAGGREGATION: By target community.

PURPOSE: The aim of the CBD program is to increase contraceptive use by increasing access and raising demand through IEC activities. For PHE programs, community volunteers are usually recruited to be community-based distributors, making CBD programs especially effective in rural and isolated communities where demand is limited and access to alternative methods is low.

DATA SOURCES: Population-based surveys, project records.

TIME FRAME: Annually for project records, every three to five years for surveys.

DATA COLLECTION CONSIDERATIONS: The questionnaire for surveying women in the target area should include the type of commodities/methods received in the previous year.

STRENGTHS & LIMITATIONS: Community-based distributors tend to be low-volume independent distributors in isolated and sometimes difficult-to-reach areas, creating the need for field workers to resupply these posts frequently and provide supervision and continuous training in contraceptive method use and risks.

## COUPLE-YEARS OF PROTECTION



LEVEL OF MEASUREMENT: Output.

DEFINITION: Couple-years of protection is the estimated protection provided by family planning services during a one-year period based on the volume of all contraceptives sold or distributed to clients during that period.

CALCULATION: See Tables 9 and 10.

**Table 9. How to Calculate Couple-Years of Protection**

Multiply the quantity of each method distributed to clients by the conversion factor below to obtain a CYP per method. Then sum each CYP to obtain a total CYP figure.		
Method	Units per CYP	Conversion factor
Oral contraceptives	15 cycles per CYP	$\frac{1}{15}$
Condoms	120 units per CYP	$\frac{1}{120}$
Female condoms	120 units per CYP	$\frac{1}{120}$
Vaginal foaming tablets	120 units per CYP	$\frac{1}{120}$
Depo Provera injectable	4 doses per CYP	$\frac{1}{4}$
Noristerat Injectable	6 doses per CYP	$\frac{1}{6}$
Cyclofem monthly injectable	13 doses per CYP	$\frac{1}{13}$
Emergency contraceptive pills	20 doses per CYP	$\frac{1}{20}$
Copper-T380-A IUD	3.5 CYP per IUD inserted	3.5
Norplant implant	3.5 CYP per implant	3.5
Implanon implant	2 CYP per implant	2
Jadelle implant	3.5 CYP per implant	3.5
Natural family planning (i.e., Standard Days Method)	2 CYP per trained, confirmed adopter	2
Lactational Amenorrhea Method	4 active users per CYP (or 0.25 CYP per user)	0.25
Sterilization (male & female)		
Asia	10 CYP	10
Latin America	10 CYP	10
Africa	8 CYP	8
Near East/North Africa	8 CYP	6

**Table 10. Example of Family Planning Service Distribution by a Facility**

Method	Quantity	Conversion Factor	CYP
Oral contraceptives	4,321	$\frac{1}{15}$	288.1
Condoms	9,900	$\frac{1}{120}$	82.5
IUDs	80	3.5	280.0
Total	---	---	650.6



DISAGGREGATION: By method.

PURPOSE: Couple-years of protection is a simple, inexpensive way to measure program activity volume using routinely collected data. It can monitor the progress of contraceptive service delivery at the program and project levels.

DATA SOURCES: Service statistics.

TIME FRAME: Annually.

DATA COLLECTION CONSIDERATIONS: Standardized forms, facility “logbooks,” and tracking of commodities are necessary for calculation of this indicator. Regarding the calculation of long-term methods, most programs credit the entire amount to the calendar year in which the client accepted the method. For example, if a family planning program in Asia performed 100 voluntary sterilization procedures in a given year, it would credit all 1,000 CYP (i.e., 100 procedures x 10 years each) to that calendar year, even though the protection from those programs would in fact be realized over that year and the next nine years.

STRENGTHS & LIMITATIONS: Couple-years of protection can be obtained from different service delivery mechanisms. However, the value of this indicator can be difficult to understand. Data on CYP do not provide individual contraceptive use rates. The validity of the conversion factors is still debated, and the number of people represented is not evident in this calculation.

## PERCENTAGE OF SKILLED HEALTH PERSONNEL KNOWLEDGEABLE IN OBSTETRIC WARNING SIGNS



LEVEL OF MEASUREMENT: Output.

DEFINITION: Skilled health personnel include midwives, doctors, and nurses with midwifery and lifesaving skills. Traditional birth attendants (TBAs) are typically not included in this definition. Staff members are considered “knowledgeable” if they can name at least three of the following warning signs of obstetric complications:

1. Bleeding
2. Labor lasting more than 12 hours
3. Placenta retained more than one hour
4. Convulsions or swelling of the hands or face (i.e., eclampsia)
5. Fever and vaginal discharge (i.e., puerperal sepsis)

CALCULATION:

$$\frac{\text{\# of skilled health personnel who know at least three warning signs}}{\text{Total \# of skilled health personnel interviewed}} \times 100$$

DISAGGREGATION: None.

PURPOSE: This indicator is used to assess the knowledge of skilled health personnel as the basis for their ability to make timely referrals to obstetric services. TBAs are not usually included for this indicator. However, because PHE projects often train TBAs, TBA numbers may be tracked separately.

DATA SOURCES: Health worker interviews.

TIME FRAME: Annually for training records, every two to five years for surveys.

DATA COLLECTION CONSIDERATIONS: Ensuring that obstetric warning signs are defined in advance and used consistently for tracking this indicator over time is essential to the validity of this figure.

STRENGTHS & LIMITATIONS: Knowledge of obstetric warning signs does not indicate that health personnel are knowledgeable about the severity of warning signs or that they know how to deal with the complications.

## NUMBER OF ACCEPTORS NEW TO MODERN CONTRACEPTION



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: For this indicator, an acceptor is a person using any modern contraceptive method for the first time in his or her life within the past year. Modern contraceptive methods include IUDs, pills, implants, injections, condoms, spermicides, diaphragms, tubal ligation, and vasectomy.

CALCULATION: None.

DISAGGREGATION: By method (if desired).

PURPOSE: This indicator measures a program's ability to attract new clients from an untapped segment of the population.

DATA SOURCES: Usually service statistics, occasionally population-based surveys.

TIME FRAME: Annually using service statistics, every two to five years using a population-based survey.

DATA COLLECTION CONSIDERATIONS: Program personnel can disaggregate service statistics by key variables (e.g., age, sex, place of residence, other factors deemed relevant in the country context).

STRENGTHS & LIMITATIONS: Defining this indicator in terms of first-time use in the life of an individual removes the ambiguity associated with the more general term "new acceptor" that can include individuals who are new to a clinic or a method but not to modern contraceptive use. However, this indicator measures absolute numbers, not the proportion of the population. It does not measure how long contraceptive use continues or if methods are used properly.

## CONTRACEPTIVE PREVALENCE RATE



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: Contraceptive prevalence rate is defined as the percentage of reproductive-age women (ages 15–49) who are using a contraceptive method at a particular point in time. This is almost always reported for women married or in a sexual union. Generally, this includes all contraceptive methods (i.e., modern and traditional), but it may include modern methods only. The program manager should decide in advance whether any method or just modern methods will be included in calculating this indicator. The World Health Organization (WHO) defines modern contraceptive methods as female and male sterilization, injectable and oral hormones, IUDs, diaphragms, hormonal implants, spermicides, and condoms. Traditional methods include the calendar method (i.e., rhythm method), withdrawal, abstinence, and the lactational amenorrhea method.

CALCULATION:

$$\frac{\text{\# of partnered women (married or in union) of reproductive age using a contraceptive method}}{\text{Total \# of partnered women (married or in union) of reproductive age}} \times 100$$

DISAGGREGATION: By modern and traditional methods.

PURPOSE: Contraceptive prevalence rate measures population coverage of contraceptive use, taking all sources of supply and contraceptive methods into account.

DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years.

DATA COLLECTION CONSIDERATIONS: In countries with a widespread practice of sexual activity outside marriage or stable sexual unions, a prevalence estimate based only on women in unions would ignore a considerable number of current users of contraception.

STRENGTHS & LIMITATIONS: This indicator is widely used. To calculate a true contraceptive rate, the denominator should include only women at risk of pregnancy, which is difficult to measure. This indicator does not measure how long women have been using contraceptives or if they are using them correctly.

## PERCENTAGE OF DELIVERIES OCCURRING IN A HEALTH FACILITY



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: A health facility is defined as a permanent building where trained health providers work with the primary intent of practicing preventive or curative medicine.

CALCULATION:

$$\frac{\text{Total \# of deliveries occurring in a health facility in a given period}}{\text{Total \# of births within a specified area in the same period}} \times 100$$

Using all births to calculate this indicator is ideal, but using only live births is also acceptable. Where data on the number of live births are unavailable, calculate total expected births by multiplying population by the crude birth rate. If the crude birth rate is unknown, WHO recommends using 3.5 percent of the total population as an estimate of the number of pregnant women.

DISAGGREGATION: None.

PURPOSE: Institutionalized deliveries are associated with reduced maternal mortality and increased infant survival rates. Many PHE projects train personnel to increase the number of women seeking medical assistance during normal childbirth.

DATA SOURCES: Service statistics, population-based surveys.

TIME FRAME: Annually using service statistics, every three to five years using a population-based survey.

DATA COLLECTION CONSIDERATIONS: Frequent surveys are generally unreliable because survey periods may overlap; for international comparisons, a reference period of three to five years is probably sufficient.

STRENGTHS & LIMITATIONS: This indicator is easily calculated from population-based surveys. This indicator is birth-based, so it is representative of births. The sample will overrepresent women with multiple births in the reference period. These women are also more likely to have other risk factors and lower rates of health facility use. The indicator will therefore underestimate the percentage of women delivering in a health facility.

## PERCENTAGE OF BIRTHS ATTENDED BY SKILLED HEALTH PERSONNEL



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: Skilled health personnel are professionals with defined skills and knowledge that enable them to provide safe health care during childbirth. Skilled health personnel include doctors, midwives, and nurses with midwifery and lifesaving skills. TBAs are generally not included in this indicator. However, because PHE projects often train TBAs, TBA numbers may be tracked for other purposes.

CALCULATION:

$$\frac{\text{\# of births attended by skilled personnel during the reference period}}{\text{Total \# of live births occurring within the reference period}} \times 100$$

Using all births to calculate this indicator is ideal, but using only live births is also acceptable. Where data on the number of live births are available, calculate total expected births by multiplying the population by the crude birth rate. If the crude birth rate is unknown, WHO recommends using 3.5 percent of the total population as an estimate of the number of pregnant women.

DISAGGREGATION: By geographic area or type of attendant.

PURPOSE: This indicator provides information on women's use of delivery services. Many argue that increasing the proportion of deliveries with a skilled attendant is the most critical intervention for reducing maternal mortality. It is also important for reducing newborn mortality.

DATA SOURCES: Service statistics, population-based surveys.

TIME FRAME: Annually using service statistics, every three to five years using a population-based survey.

DATA COLLECTION CONSIDERATIONS: Both the numerator and the denominator should fall within the same defined period. Frequent surveys are generally unreliable because survey periods may overlap. For international comparisons, a reference period of three to five years is probably sufficient.

STRENGTHS & LIMITATIONS: Differences in definitions of "skilled health attendant" and other terms may lead to discrepancies between countries. Mothers who self-report for this indicator may not accurately identify who is a skilled health attendant. This indicator does not include stillbirths.

## PERCENTAGE OF WOMEN ATTENDED TO AT LEAST ONCE DURING PREGNANCY FOR REASONS RELATED TO PREGNANCY



**LEVEL OF MEASUREMENT:** Outcome.

**DEFINITION:** This indicator measures the percentage of women attended to at least once during pregnancy by skilled health personnel for reasons related to pregnancy.

**CALCULATION:**

$$\frac{\text{\# of pregnant women attended to by skilled personnel for pregnancy-related reasons during a specified period}}{\text{Total \# of live births occurring within the specified period}} \times 100$$

**DISAGGREGATION:** None.

**PURPOSE:** This indicator provides information about women’s use of antenatal care services.

**DATA SOURCES:** Service statistics, population-based surveys.

**TIME FRAME:** Annually using service statistics, every two to five years using a population-based survey.

**DATA COLLECTION CONSIDERATIONS:** The number of live births is a proxy for the number of all women who need antenatal care. All births should be included in the denominator; however, information about non-live births is difficult to obtain, so the number of live births may be substituted in its place. Both numerator and denominator should fall within the same period. Where information about the total number of live births is not available, the total number of live births can be estimated by multiplying the target area’s population by the crude birth rate. In settings where the crude birth rate is unknown, WHO recommends using 3.5 percent of the total population as an estimate of pregnant women (i.e., number of live births or pregnant women = total population x .035).

**STRENGTHS & LIMITATIONS:** This indicator does not capture detailed information about the reasons or timing of visits or about quality of care. Antenatal care services may not exist in some rural or remote regions where PHE programs work.

## PERCENTAGE OF WOMEN WHO ATTENDED AT LEAST FOUR ANTENATAL CARE VISITS DURING PREGNANCY



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator measures the percentage of women ages 15–49 with live births within a given period who attended antenatal care four or more times during their most recent pregnancy.

CALCULATION:

$$\frac{\text{\# of women ages 15–49 with live births who attended antenatal care four or more times during most recent pregnancy during specified period}}{\text{Total \# of live births occurring within the specified period}} \times 100$$

DISAGGREGATION: By antenatal care visits at a health facility or during outreach.

PURPOSE: This indicator provides information about women’s use of antenatal care services.

DATA SOURCES: Service statistics, population-based surveys.

TIME FRAME: Annually using service statistics, every two to five years using a population-based survey.

DATA COLLECTION CONSIDERATIONS: The number of live births is a proxy for the number of all women who need antenatal care. All births should be included in the denominator; however, information about non-live births is difficult to obtain, so the number of live births may be substituted in its place. Both numerator and denominator should fall within the same period. Where information about the total number of live births is not available, the total number of live births can be estimated by multiplying the target area’s population by the crude birth rate. In settings where the crude birth rate is unknown, WHO recommends using 3.5 percent of the total population as an estimate of pregnant women (i.e., number of live births or pregnant women = total population x .035).

STRENGTHS & LIMITATIONS: This indicator does not capture detailed information about the reasons or timing of visits or about quality of care. Antenatal care services may not exist in some rural or remote regions where PHE programs work.



## HEALTH INDICATORS

Child survival and environmental health activities work toward reducing child morbidity, mortality, and disease incidence. Child health and survival has been a focus for many large-scale international programs, including the Millennium Development Goals, the Integrated Management of Childhood Illness strategy, the Global Alliance for Vaccines and Immunization, and the Roll Back Malaria initiative.

Many communities served by PHE projects have identified child health and survival as a priority. The indicators in this section have been chosen to measure indicators at the levels of inputs, processes, outputs, and short- to medium-term outcomes rather than long-term outcomes of disease incidence and infant and child mortality. Together, these indicators cover a broad range of environmental and child health activities. Most PHE programs work on achieving the shorter-term outcomes in a smaller community and contribute to a larger effort in the area to improve child health. Depending on their focus and resources, PHE programs can choose the indicators most appropriate for their own work. Table 11 is a list of common health indicators.

**Table 11. Commonly Collected Health Indicators**

Indicator	HOPE LVB	Tuungane
Number of children under five presenting at clinic/health post with diarrhea, fever, or ARI over past month	X	
Percentage of children ages 12–23 months fully immunized before 12 months	X	
Percentage of households with an improved toilet facility	X	
Percentage of households with soap or basic handwashing facilities	X	
Percentage of health facilities that have all essential medicines and commodities in stock on the day of visit.		X

## NUMBER OF DOSES OF TETANUS VACCINE DISTRIBUTED



LEVEL OF MEASUREMENT: Output.

DEFINITION: This involves the total number of doses of tetanus vaccine distributed by a program or facility in a specified period. These doses include the total of any 'TT' or tetanus-diphtheria toxoid (Td) vaccines. The period should be defined in advance. The information is usually collected monthly at the facility and aggregated quarterly by the project manager.

CALCULATION: None

DISAGGREGATION: None or by facility/distributor (if desired).

PURPOSE: Neonatal tetanus kills 200,000 infants in the developing world every year. This indicator can measure program or clinic capacity to promote prevention of this disease. PHE projects frequently distribute immunizations through facility-based and community-based methods.

DATA SOURCES: Service statistics.

TIME FRAME: Monthly, quarterly.

DATA COLLECTION CONSIDERATIONS: Doses of tetanus vaccine are given to women of childbearing age and to pregnant women without previous exposure to 'TT'; Td; or diphtheria, tetanus, and pertussis (DTP) vaccines. This indicator can be used as a template for measuring other vaccines distributed by the project, substituting tetanus with the vaccine of interest.

STRENGTHS & LIMITATIONS: Data for this indicator are easily collected, and the indicator can quickly estimate a program or facility's reach in a given region. However, this indicator does not measure whether vaccines were administered correctly or the proportion of targeted populations reached.

## NUMBER OF INSECTICIDE-TREATED BED NETS DISTRIBUTED



LEVEL OF MEASUREMENT: Output.

DEFINITION: This involves the number of ITNs distributed by the project in a region in a given reference period (e.g., quarterly). The bed nets have been dipped in an insecticide effective against local malaria-causing mosquitoes.

CALCULATION: None.

DISAGGREGATION: None or by facility/distributor (if desired).

PURPOSE: Insecticide-treated bed nets are an inexpensive and effective way to reduce malaria transmission. Calculating the number of bed nets distributed is an important part of assessing the capacity of malaria prevention programs.

DATA SOURCES: Service statistics.

TIME FRAME: Monthly, quarterly.

DATA COLLECTION CONSIDERATIONS: Distribution data are sometimes collected at the warehouse level and sometimes collected at the distributor level. There is a need to be clear about the level of the data. Distributor-level data are preferred over warehouse-level data.

STRENGTHS & LIMITATIONS: Distribution data are much easier to collect than data on actual use of bed nets. However, this indicator does not measure the use of bed nets or access to bed nets by groups that need them. This indicator will not estimate the proportion of bed nets distributed or used in a region; neither will it estimate distribution in relation to need, which varies from season to season and among population groups (i.e., infants and pregnant women). If data are collected at the warehouse level, then the indicator only measures the distribution to distributors, not to the target population.

## NUMBER OF PACKETS OF ORAL REHYDRATION SALTS DISTRIBUTED



LEVEL OF MEASUREMENT: Output.

DEFINITION: This involves the number of ORS packets distributed by the project over a given period. The packets contain a balanced mixture of glucose and electrolytes to prevent and treat dehydration, potassium depletion, and base deficit due to diarrhea. When ORS packets are dissolved in water, the mixture is called an oral rehydration solution.

CALCULATION: None.

DISAGGREGATION: None or by facility/distributor (if desired).

PURPOSE: Diarrhea is a principal cause of morbidity and mortality among children in developing countries. Diarrhea is defined as three or more loose or watery stools during a 24-hour period.

DATA SOURCES: Service statistics.

TIME FRAME: Monthly, quarterly.

DATA COLLECTION CONSIDERATIONS: In some cases, a homemade mixture similar to packaged ORS may be used by households for ORT. Use of this homemade mixture would not be included in this indicator, as it is not a product that the project distributed to clients. Use of the packet does not measure whether the ORS were used with safe water.

STRENGTHS & LIMITATIONS: This indicator can measure the capacity of regional diarrhea-control programs and the number of ORS packets provided to a region, but it does not measure the use of or access to ORS. The indicator will not estimate the proportion of packets distributed in relation to the population or in relation to the needs of the region.

## NUMBER OF SAFE WATER STORAGE VESSELS DISTRIBUTED



LEVEL OF MEASUREMENT: Output.

DEFINITION: This measures the number of safe water storage vessels distributed in a region over a given period. Safe storage vessels either should have a narrow neck and be covered, or should store water where household members cannot serve themselves directly (e.g., in roof tanks or cisterns).

CALCULATION: None.

DISAGGREGATION: By facility/distributor (if desired).

PURPOSE: Water must be stored safely to avoid contamination and the spread of infection. Some households may not have access to containers or vessels to store water where it can be free from dirt or other contamination.

DATA SOURCES: Service statistics.

TIME FRAME: Monthly, quarterly.

DATA COLLECTION CONSIDERATIONS: It is useful to identify storage containers from which water is removed by dipping, although these containers are not considered to be adequate for safe water storage. Dipping introduces objects (e.g., ladles, cups, dippers), and often hands that hold these objects, into stored water, thereby negating the benefits of a cover.

STRENGTHS & LIMITATIONS: This indicator can be used to measure the capacity of safe water distribution efforts cheaply, as well as the number of water storage vessels provided to a region. However, people must have access to safe water to begin with for safe water storage vessels to have any impact. Water safety also depends on proper use and knowledge, which this indicator does not measure. This indicator also does not estimate the proportion of storage vessels distributed in relation to the population.

## PERCENTAGE OF PREGNANT WOMEN RECEIVING AT LEAST TWO DOSES OF TETANUS TOXOID VACCINE



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: A newborn’s protection against neonatal tetanus is determined by the mother. To protect newborns, women previously not immunized should receive two doses of TT or Td vaccine during their first pregnancy and one dose of TT or Td during each subsequent pregnancy, up to a maximum of five doses. Td provides tetanus protection identical to that of TT and provides protection against diphtheria.

CALCULATION:

$$\frac{\text{\# of pregnant women who have received two or more doses of TT or Td vaccines}}{\text{Total \# of live births}} \times 100$$

DISAGGREGATION: By facility or target area (if desired).

PURPOSE: Neonatal tetanus is responsible for 14 percent of all neonatal deaths in the developing world. A child is considered fully protected if the mother has had at least two TT or Td doses within the past three years or has had five lifetime TT or Td doses (Table 12).

DATA SOURCES: Service statistics, population-based surveys.

TIME FRAME: Annually using service statistics, every two to five years using a population-based survey.

DATA COLLECTION CONSIDERATIONS: When using service statistics to calculate this indicator, the reference period is usually the previous 12 months, with the total number of doses given as the numerator and the total number of live births in the previous 12 months used as the denominator. When collecting this indicator using a population-based survey, the numerator is the number of women giving birth during a reference period (e.g., three years) who report receiving at least two doses of TT vaccine, and the denominator is the number of live births in the same reference period. The number of live births serves as a proxy for the number of pregnant women.

Where data on the number of live births are unavailable, evaluators can estimate the total number of live births using census data. Total expected births equal the area’s population times the crude birth rate. In settings where the crude birth rate is unknown, WHO recommends estimating the number of pregnant women as 3.5 percent of the total population (i.e., population x 0.035).

STRENGTHS & LIMITATIONS: This indicator allows routine reporting to monitor TT coverage. Mothers who have not received two or more doses can be vaccinated immediately to protect their pregnancies and future children. However, pregnant women who have received two TT doses may not yet be fully protected.

**Table 12. WHO-Recommended TT Immunization Schedule for Women of Childbearing Age and Pregnant Women without Previous Exposure to TT, Td, or DTP**

Dose of TT, Td, or DTP	When Given	Level of Protection	Duration of Protection
TT 1	At first contact or as early as possible in pregnancy	None	None
TT 2	At least 4 weeks after TT 1	80%	1-3 years
TT3	At least 6 months after TT 2 or during subsequent pregnancy	95%	At least 5 years
TT 4	At least one year after TT 3 or during subsequent pregnancy	99%	At least 10 years
TT 5	At least one year after TT 4 or during subsequent pregnancy	99%	For all childbearing years and possibly longer

## PERCENTAGE OF CHILDREN AGES 12–23 MONTHS FULLY IMMUNIZED BEFORE 12 MONTHS



**LEVEL OF MEASUREMENT:** Outcome.

**DEFINITION:** This measures the percentage of children ages 12–23 months who have received three doses of oral polio vaccine, three doses of DTP, and one dose each of *bacille Calmetter-Guérin* and measles vaccines before 12 months. (The definition of “fully immunized” may change as new and underutilized vaccines are introduced.)

**CALCULATION:**

$$\frac{\text{\# of children ages 12–23 months fully vaccinated before 12 months of age}}{\text{Total \# of children ages 12–23 months surveyed}} \times 100$$

**DISAGGREGATION:** None.

**PURPOSE:** This indicator measures how well a country or region delivers recommended vaccines during a child’s first year of life. It also measures public demand and perceived quality of services. Table 13 provides a logic model for common elements of vaccination programs.

**DATA SOURCES:** Population-based surveys.

**TIME FRAME:** Every two to five years.

**DATA COLLECTION CONSIDERATIONS:** Ideally, data are taken from a child’s vaccination card. If the mother cannot produce a card, she is asked about her child’s vaccinations. The source of data should be noted for each child surveyed.

**STRENGTHS & LIMITATIONS:** This indicator helps measure progress toward reducing morbidity and mortality due to six common vaccine-preventable diseases. This indicator does not differentiate between a child who has received most but not all vaccinations and a child who has received none at all, and neither does it indicate whether doses were given at proper intervals or ages. Data sources for this indicator are not always reliable. The current definition of “fully immunized” is subject to change within a region and over time.

**Table 13. Monitoring immunization programs**

<b>Inputs</b>	Vaccines, refrigerators, temperature charts, vaccination cards, needles, syringes
<b>Processes</b>	Training, supervision, service delivery, surveillance
<b>Outputs</b>	Functional outputs: immunization sessions held, education sessions held, health workers trained in epidemiology Service outputs: client satisfaction, client services
<b>Outcomes</b>	Increased coverage, reduced dropout, increased parents’ knowledge of when to return
<b>Impacts</b>	Reduced disease incidence, lower infant and child mortality



## AVERAGE HOUSEHOLD DISTANCE/TIME TO THE NEAREST HEALTH CENTER



LEVEL OF MEASUREMENT: Output.

DEFINITION: This is the average time or distance from a respondent's place of residence to the nearest service delivery site offering the measured service. The services included in this measurement should be determined in advance by the project, depending on the project's objectives.

CALCULATION:

$$\frac{\text{\# of hours/distance reported by all households surveyed}}{\text{Total \# of households surveyed}} \times 100$$

Mapping software and aerial photographs can also be used to capture distance between communities and the nearest health facilities.

DISAGGREGATION: By services offered (if desired).

PURPOSE: Distance to a health facility is often a major factor determining whether or not people truly have access to that facility, especially when transport is not easily available.

DATA SOURCES: Global positioning systems or mapping of the routes can be used to calculate the distance between health centers and communities. A less reliable option is using a population-based survey in which household members are asked the distance or time it takes them to reach the nearest health center that provides the measured service.

TIME FRAME: Every one to two years.

DATA COLLECTION CONSIDERATIONS: This indicator is useful for demonstrating the effects of providing health services in remote, underserved areas. These areas may contain relatively few people, but the impact of providing services there may be great because there were no or few pre-existing services. In these instances, the PHE project should compare the distance or travel time for the target population to get to distant health centers with the distance or average time it takes the target population to get to the newly established health center.

STRENGTHS & LIMITATIONS: Community members may visit distant health facilities to maintain confidentiality. The expense and effort required to obtain this indicator may mean it can only be collected every few years.

## PERCENTAGE OF HOUSEHOLDS WITH ACCESS TO AN IMPROVED SOURCE OF DRINKING WATER



LEVEL OF MEASUREMENT: Output.

DEFINITION: This measures the percentage of households with access to one of the following types of water supply for drinking: water piped into a dwelling or yard, public taps, boreholes/pumps, protected wells, protected springs, tippy-taps, or rain water. “Unimproved” water sources include an unprotected dug well or spring, surface water (i.e., river, dam, lake, pond, stream, canal, irrigation channel), water truck, and any other type of mobile supply.

Different definitions of “access” limit the usefulness of this indicator for cross-national comparisons. This indicator is mainly useful for indicating whether the available water source is improved or unimproved. While the household may access the water source, access could still be limited because of the time it takes to get water or the water source’s seasonal availability.

CALCULATION:

$$\frac{\text{\# of households with access to an improved source of drinking water}}{\text{Total \# of households surveyed}} \times 100$$

DISAGGREGATION: By target area (if necessary).

PURPOSE: Lack of clean water for drinking and sanitation greatly increases disease transmission through contact with feces. This indicator is an approximation of access to safe water and an indirect indicator of water use. The closer a water source is to a family, the more water the family tends to use.

DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years.

DATA COLLECTION CONSIDERATIONS: Information on the household’s main source of drinking water can be obtained verbally from heads of households or from interviewer observation. Interviewers should be familiar with different types of water supply. If bottled water is mentioned as the main source of drinking water, a second source of water for cooking and hygiene should also be recorded. The water source may differ according to season, and access during a dry season should be recorded. Distinguishing between protected water sources that are “improved” and those that are “unimproved” is a challenge. Protected dug wells are covered and have raised linings or casings and platforms to divert spilled water. Protected springs have boxes to protect the springs from runoff and other contamination. Both of these sources may be considered improved or unimproved, depending on circumstances.

STRENGTHS & LIMITATIONS: Data to calculate this indicator are easily collected; families and individuals use and drink most of their water at home. Specific, simple definitions for an “improved water source” increase the chances of getting precise, accurate information from interviews. However, water from an improved source may still be unsafe if it is contaminated or used without proper hygiene practices, and this indicator does not address these issues of water quality. Water may be effectively treated even if taken from an unsafe source. Water usage may differ substantially within and outside of the household.

## AVERAGE TIME SPENT BY HOUSEHOLD MEMBERS TO COLLECT WATER



LEVEL OF MEASUREMENT: Output.

DEFINITION: This measures the time household members spent in the last 24 hours collecting water from one of the following safe sources: piped water, public taps, boreholes/pumps, protected wells, protected springs, or rain water. Time should be collected in minutes, even if the time is more than one hour (e.g., 75 minutes), and should be measured on a daily basis. It is the amount of time spent, rather than the distance, that is of interest; the water source could be reached by foot, car, or bicycle. This indicator should include time spent waiting in line, filling containers, and performing other collection activities.

CALCULATION:

$$\frac{\text{\# of hours reported by all households surveyed}}{\text{Total \# of households surveyed}} \times 100$$

DISAGGREGATION: By sex.

PURPOSE: In households without an improved water source at home, the effort required to obtain water can be a substantial drain on already strained time and resources. This indicator allows an estimate of this effort and can be used to prioritize where efforts to improve water access should be focused.

DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years.

DATA COLLECTION CONSIDERATIONS: Information can be obtained verbally from heads of households and for each household member. Time collecting water needs to be summed across household members to obtain the total time spent collecting water by a household. This indicator is typically presented as the average time households spend collecting water at the population level.

STRENGTHS & LIMITATIONS: This indicator also measures economic status. Having respondents answer questions about their most recent experience lowers the likelihood that respondents will give inaccurate estimates. Data for this indicator are easily collected. However, the average time needed to collect water may vary substantially from year to year or season to season. Also, this indicator does not measure whether the water from the source is safe to drink.

## PERCENTAGE OF HOUSEHOLDS WITH VENTILATION IN COOKING AREAS



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: A ventilated cooking area should have some duct or hood that allows cooking smoke to escape through the roof or out a window.

CALCULATION:

$$\frac{\text{\# of households with sufficient ventilation in cooking areas}}{\text{Total \# of households surveyed}} \times 100$$

DISAGGREGATION: None.

PURPOSE: Indoor air pollution is a major cause of morbidity and mortality in developing countries. Unventilated cooking areas, especially when solid fuels are used for cooking, greatly increase the risk for developing lung cancer as well as acute or chronic respiratory diseases. Women are disproportionately affected, as they do most of the cooking.

DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years.

DATA COLLECTION CONSIDERATIONS: Determining what constitutes ventilation may be a challenge. Interviewers should ask heads of households if the cooking area has ventilation. Additionally, interviewers should request to observe the available ventilation.

STRENGTHS & LIMITATIONS: Data for this indicator are easily collected. This indicator can quickly estimate where to target interventions. However, exposure to and effects of indoor air pollution depend on many factors, such as type of cooking fuel used, whether or not sleeping and cooking areas are separated, and the amount of time spent in cooking areas.

## PERCENTAGE OF HOUSEHOLDS USING AN IMPROVED WATER SOURCE



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator measures the proportion of households using an improved water source for their drinking water. An improved drinking water source refers to a structure that is protected from environmental elements and contamination. Examples of improved water sources are water piped into a dwelling or yard, public taps, boreholes/tube wells, protected springs, rainwater, and bottled water. Those using bottled water should have a secondary source of water as well.

CALCULATION:

$$\frac{\text{\# of households using an improved water source}}{\text{Total \# of households surveyed}} \times 100$$

DISAGGREGATION: None

PURPOSE: This indicator is a proxy for a household's access to safe drinking water. Protected or "improved" water sources are less likely to carry diseases and contribute to lower prevalence of waterborne and diarrheal diseases.

DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years or at baseline and end line.

DATA COLLECTION CONSIDERATIONS: This indicator is specifically looking at the use of the improved water source, rather than just the existence of an improved water source, in the household. If a population-based survey that asks this question to household members is not feasible, improved water sources can be observed through a transect survey that counts the number of households or communities with access to an improved water source.

STRENGTHS & LIMITATIONS: There may be difficulties determining if a water source is indeed considered an improved water source in some communities. Determining locally appropriate, improved sources and taking pictures of them for reference may be advisable for some population-based surveys or observations.

## PERCENTAGE OF HOUSEHOLDS WITH AN IMPROVED TOILET FACILITY



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: An “improved” toilet facility means a flush/pour-flush toilet connected to a piped sewer system, septic tank, or pit; a ventilated-improved-pit latrine; a simple pit latrine with slabs that can be cleaned; or a composting toilet. An “unimproved” toilet facility includes flush/pour-flush toilets that empty elsewhere without connection to piped sewage systems, septic tanks, or pits or have unknown drainage; pit latrines without slabs or open pits; bucket latrines (where excreta are manually removed); hanging toilets/latrines; open defecation in a field, in a bush, or into plastic bags (flying toilets); and any other type of defecation.

CALCLUATION:

$$\frac{\text{\# of households that have working improved toilet facilities within their compounds}}{\text{Total \# of households surveyed}} \times 100$$

DISAGGREGATION: None.

PURPOSE: Access to a functioning and improved toilet facility is essential for improving a household’s hygienic situation. This indicator measures access to such facilities.

DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years.

DATA COLLECTION CONSIDERATIONS: Household heads or caretakers should be interviewed about the type of toilet facility they use; afterwards, interviewers should observe the facility to see if it is accessible.

STRENGTHS & LIMITATIONS: This indicator does not measure whether toilet facilities are used or whether they are hygienic.

## PERCENTAGE OF HOUSEHOLDS WITH SOAP OR BASIC HANDWASHING FACILITIES



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator measures the percentage of households with basic handwashing facilities, which can include the availability of soap, ash, sand, or mud; a location of facilities near the toilet or place of defecation; and accessibility for all household members. Use of soap at the most critical times (i.e., after defecation and before cooking or eating) for handwashing can decrease the risk of diarrheal disease. Although ash, sand, and mud are mentioned in the literature as local alternatives, neither their acceptability as cleansing agents nor their actual use on a significant scale has been established. The use of soap for washing hands is commonly promoted through public-private partnerships.

CALCULATION:

$$\frac{\text{\# of households that have soap or basic handwashing facilities}}{\text{Total \# of households surveyed}} \times 100$$

DISAGGREGATION: None.

PURPOSE: Washing hands with soap is essential to controlling diarrheal diseases. This indicator represents actual behavior, not knowledge. Washing hands with soap at two critical times is suggested as a minimum, but programs may choose to set higher targets if more frequent handwashing seems achievable.

DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years.

DATA COLLECTION CONSIDERATIONS: Alternatively, the interviewer can observe handwashing facilities and techniques, but this would not measure soap use—only the availability of handwashing supplies. The household respondent (often the caregiver of the youngest child) is asked about his or her use of soap in the past 24 hours, to reduce recall bias. It is important to also ask whether the household has soap.

STRENGTHS & LIMITATIONS: This indicator is easily collected, and observation allows for a reliable assessment of available conditions. However, this indicator does not necessarily measure proper water storage, handwashing techniques, or the frequency with which hands are washed on a regular basis.

## PERCENTAGE OF HOUSEHOLDS STORING DRINKING WATER SAFELY

3 GOOD HEALTH AND WELL-BEING



6 CLEAN WATER AND SANITATION



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: Storing drinking water safely means that the water should not be contaminated by exposure to dust or dirt. Safe containers should be tightly covered and narrow-necked. Tightly covered containers have a screw-top lid or a plate-like cover that completely covers the water storage container and fits tightly. Narrow-necked means containers have a neck of 3 cm or less in diameter. Additional water should be stored in cisterns or roof tanks.

CALCULATION:

$$\frac{\text{\# of households storing drinking water safely}}{\text{Total \# of households surveyed}} \times 100$$

DISAGGREGATION: None.

PURPOSE: Water will not remain safe from contaminants unless it is properly stored. Narrow necks and tight lids keep dirt and dust out of water; cisterns and roof tanks are considered safe because they do not allow individual family members to serve themselves directly by introducing a cup, ladle, or other device into the water source.

DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years.

DATA COLLECTION CONSIDERATIONS: The interviewer for the household survey should ask how the household stores its water and then examine the container to ascertain if it is narrow-necked and covered. A household is counted for the numerator if it meets all criteria for proper water storage. Roof tanks and cisterns are not usually observed, but they are considered safe because they generally do not allow individuals to serve themselves directly. Only households that store drinking water are included in the denominator.

STRENGTHS & LIMITATIONS: Data for this indicator are simple to collect.



## PERCENTAGE OF CHILDREN UNDER FIVE WHO SLEPT UNDER AN INSECTICIDE-TREATED BED NET THE PREVIOUS NIGHT



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: Insecticide-treated bed nets have been dipped in an insecticide effective against local malaria-causing mosquitoes.

CALCULATION:

$$\frac{\text{\# of children under five who slept under an ITN the previous night}}{\text{Total \# of children under five surveyed}} \times 100$$

DISAGGREGATION: None.

PURPOSE: This indicator measures malaria prevention in a region. The Roll Back Malaria initiative has identified the use of ITNs as one of the four main interventions to reduce malaria in Africa.

DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years.

DATA COLLECTION CONSIDERATIONS: Mosquito prevalence varies seasonally, so when evaluating trends in this indicator, consider the time of year the surveys were conducted to clarify whether estimates reflect levels during the peak or low malarial season. Data on ITNs are usually collected by asking women ages 15–49 in the household possessing bed nets about the use of bed nets by all of their children under five. Respondents are then asked whether the bed net under which the child (children) slept has ever been treated with insecticide to repel mosquitoes or bugs. The next question can ask how long ago the bed net was treated.

STRENGTHS & LIMITATIONS: This indicator easily and quickly measures an important area of malaria prevention. The “last night” condition helps to reduce recall bias. However, this indicator assumes that nets were properly used and maintained, and use and need vary depending on the season.

## ORAL REHYDRATION THERAPY USE RATE



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: The ORT rate is the percentage of children under five (0–59 months) with diarrhea (three or more loose or watery stools during a 24-hour period) in the past two weeks who were treated with fluid using ORS or recommended home fluids (RHF). ORS come in a specific packet of dry powder that is mixed with water to make oral rehydration fluids. RHF are a specific group of liquids or foods recommended for treatment of diarrhea by a national health program or health professional. The specific liquids and foods approved for RHF vary from country to country.

CALCULATION:

$$\frac{\text{\# of children under five with diarrhea in the past two weeks who were treated with ORS or RHF}}{\text{Total \# of children under five surveyed who had diarrhea in the past two weeks}} \times 100$$

DISAGGREGATION: None.

PURPOSE: The basic principal of home management of diarrhea using ORT is to reduce dehydration by increasing fluid intake, including usage of ORS or RHF. Increases in the use of ORT are associated with marked falls in the annual number of deaths attributable to diarrhea in children under five years.

DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years.

DATA COLLECTION CONSIDERATIONS: To ascertain this information, caretakers of children under five years old with an episode of diarrhea in the past two weeks are asked whether the child was treated with ORS or RHF. Although ORS and RHF utilization is frequently used to measure ORT use for diarrhea in children, the definition of ORT has changed over time. The definition has been (1) treatment with ORS, (2) treatment with ORS or RHF, (3) treatment with increased fluids, and (4) treatment with increased fluids combined with continuous feeding (same or increased food) for the affected child. Because the definition of this indicator has changed over time, care should be taken to be consistent in the numerator and denominator of this calculation.

STRENGTHS & LIMITATIONS: The indicator is easy to measure, and the two-week period reduces problems with recall. However, the indicator does not capture timely treatment of diarrhea. It also does not measure the severity of the illness, whether safe water was used to mix ORS, continuous feeding practices, or whether ORT was administered correctly.

## PERCENTAGE OF CHILDREN UNDER FIVE WHO ARE UNDERWEIGHT



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This measures the percentage of children under five years (0–59 months) whose weight is at least -2 standard deviations below the U.S. National Center for Health Statistics/WHO’s reference population’s median weight-for-age (Figures 6 and 7).

The standard deviation, or “z-score,” is the simplest way of making comparison to the reference population. The z-score is defined as the difference between the value for an individual and the median value of the reference population in the same age or weight, divided by the standard deviation of the reference population. The median is the value at exactly the midpoint between the largest and the smallest.

The following are the cutoff points for different malnutrition classifications under the WHO child growth standards:

**Mild:** Between -1 and -2 standard deviations

**Moderate:** Between -2 and -3 standard deviations

**Severe:** Below -3 standard deviations

**\*\*Children who are below -2 standard deviations from the median are considered underweight for their age**

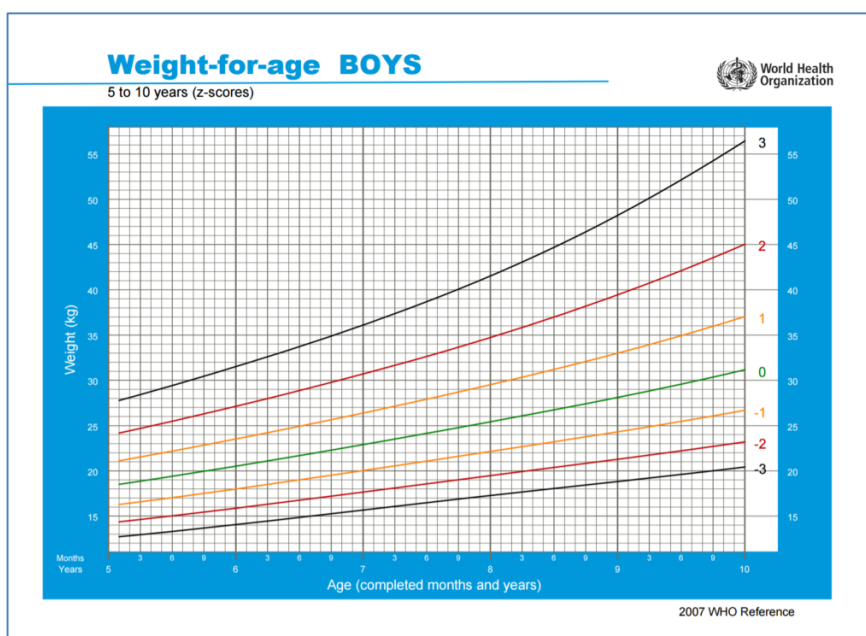
CALCULATION:

$\frac{\text{\# of children under five whose weight is at least -2 standard deviations below the reference population's median weight-for-age}}{\text{Total \# of children under five surveyed}} \times 100$
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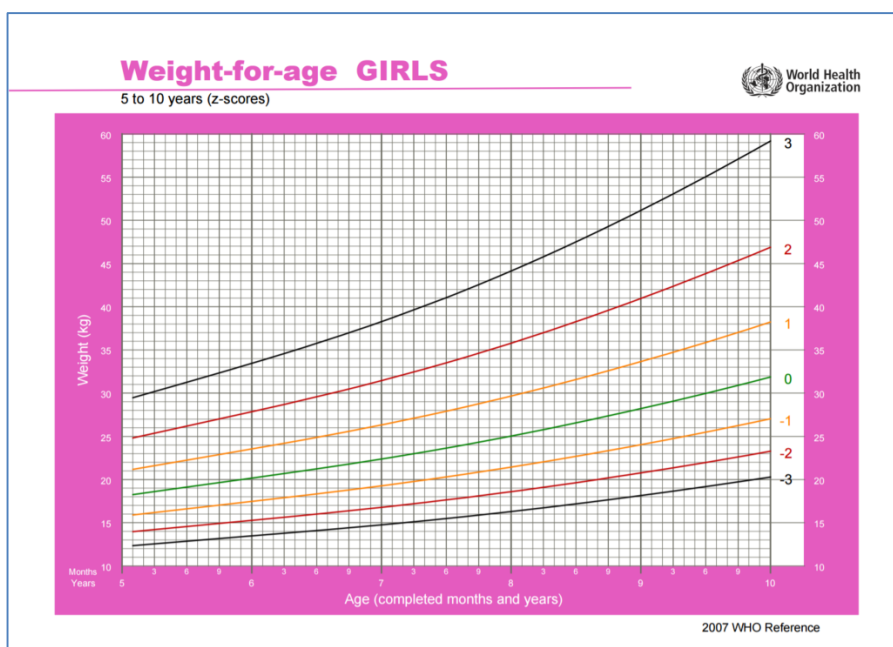
DISAGGREGATION: None.

PURPOSE: The low-weight-for-age measure identifies the condition of being underweight for a specific age. It reflects chronic and acute under-nutrition and measures the health and nutritional risk in a population. Improvements in crop yields or diversification in food sources associated with improved environmental or agricultural practices may affect this indicator.

**Figure 6. Z-Score Chart for Boys**



**Figure 7. Z-Score Chart for Girls**



DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years.

DATA COLLECTION CONSIDERATIONS: The weight and date of birth for all children under five (child's age in months is required) should be collected from their mothers. If the mother cannot recall the month her child was born, a local calendar should be used to assist her. A hanging scale can be used to measure a child's weight; alternatively, an electronic scale can be used by first recording the mother's weight while holding the baby and then subtracting the mother's weight while standing alone. Weights should be recorded in kilograms to one decimal point.

STRENGTHS & LIMITATIONS: Weight-for-age measures reflect present and past undernutrition. This indicator can be used for continuous assessment of nutritional progress and growth, to identify infants and children with poor health and nutrition, and for interventions tailored to causes of poor growth. However, inaccuracies stemming from a caretaker's estimated age of the child, as well as differences in weighing practices and instruments, can result in less reliable data. Additionally, the composite nature of this index makes interpretation difficult.

## PERCENTAGE OF CHILDREN WHO SHOW IMPROVEMENT ON A GROWTH CHART



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: The number of children under five (0–59 months) who show improvement on a standardized growth record for the proper age (i.e., from birth to five months, six months to 23 months, 24 months to 59 months). Health center workers will plot a child’s height/length and weight against charts and then calculate the child’s weight for length/height and body mass index for age. The four standardized growth charts are length/height for age, weight for age, weight for length/height, and body mass index for age. Improvement on any of these four growth charts can be counted for this indicator. Improvement depends on the gender and type of malnutrition. The standard charts for all types of malnutrition are available on WHO’s website at [www.who.int](http://www.who.int).

CALCULATION:

$$\frac{\text{\# of children under five who show improvement on a growth chart}}{\text{Total \# of children under five assessed for nutrition}} \times 100$$

DISAGGREGATION: None.

PURPOSE: Basic growth assessments determine whether a child is growing normally or has a previous, current, or possible future growth problem that should be addressed. New WHO growth charts provide prescriptive standards for normal growth, rather than simple comparisons to other children in the region.

DATA SOURCES: Service statistics.

TIME FRAME: Quarterly.

DATA COLLECTION CONSIDERATIONS: Using service statistics to collect this indicator is not representative of the general population. However, service statistics from a health facility or outreach performed by the project can show improvement in child nutrition among the clients the project aims to serve.

STRENGTHS & LIMITATIONS: Data collected using current WHO growth charts will be able to identify whether children are growing within healthy norms instead of only comparing the children to others in the region. Charts are specific for different age groups, and these new standards will better identify stunted and overweight/obese children. However, because this indicator was newly adopted, recent data will not be fully comparable to earlier data. Health care workers may not be trained on how to use the newly revised charts properly. Also, this indicator could increase if more children participate in growth monitoring, even if there is no improvement in malnutrition.

## NUMBER OF CHILDREN UNDER FIVE PRESENTING AT A HEALTH FACILITY WITH DIARRHEA, FEVER, OR ACUTE RESPIRATORY ILLNESS IN THE PAST MONTH



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This measures the number of children 0–59 months old presenting at a health facility with diarrhea, fever, or ARI during a specified period (e.g., a month).

CALCULATION: None.

DISAGGREGATION: By symptoms.

PURPOSE: Diarrheal diseases are the second leading cause of death for children under five. Diarrheal diseases are often a main cause of malnutrition in children under five and can also be used as a proxy indicator for unsafe drinking water, unsafe sanitation facilities, or unhygienic practices. Fever, which is also indicative of an illness, can be linked to bacterial or viral infections and is particularly important for early identification of malaria. Acute respiratory illnesses are associated with pneumonia, which is one of the top five causes of death for children under five.

DATA SOURCES: Population-based surveys or service statistics.

TIME FRAME: Monthly or quarterly for service statistics, every two to five years for population-based surveys.

DATA COLLECTION CONSIDERATIONS: This indicator can be monitored on a monthly, quarterly, or annual basis through service statistics (i.e., health facility records) or a population-based survey collected every two to five years or at baseline and end line. It is recommended, however, that data on this indicator be collected on a more frequent basis (e.g., quarterly or monthly) to capture any fluctuations in diarrheal disease, fever (e.g., malaria), or causes of ARI that could be alleviated through your health interventions.

STRENGTHS & LIMITATIONS: While diarrheal diseases, fevers, and ARI can often be used as a proxy for inadequate sanitation and hygiene, malaria, or respiratory irritants within an environment, there are many reasons that a child under five might present to a health facility with these symptoms. This indicator can be used as a monitoring tool more frequently than quarterly to understand any acute environmental issues within a community or household.

## PERCENTAGE OF HEALTH FACILITIES THAT HAVE ALL ESSENTIAL MEDICINES AND COMMODITIES IN STOCK ON THE DAY OF VISIT



**LEVEL OF MEASUREMENT:** Outcome.

**DEFINITION:** This is the average percentage of health facilities within your program's catchment area (or sample areas) that have all 14 essential medicines (Table 14) available and not expired on the day of a visit. WHO suggests 14 essential tracer drugs and an additional 47 medicines, commodities, and vaccines be used for this indicator.

**CALCULATION:**

$$\frac{\text{\# of facilities with all 14 essential medicines in stock (present and not expired) on the day of visit}}{\text{Total \# of facilities surveyed}} \times 100$$

**DISAGGREGATION:** None.

**PURPOSE:** The availability of 14 essential medicines (or with 47 additional medicines, commodities, and vaccines) is often used as a proxy indicator for health system strengthening and health care quality.

**DATA SOURCES:** Health facility survey or population-based survey.

**TIME FRAME:** Every two to five years or at baseline and end line.

**DATA COLLECTION CONSIDERATIONS:** The collection of this data may be time-consuming. There may be ways to leverage the use of health facility audits by other agencies, such as government structures, to gather this information. Certain logistics management and information systems capture not only orders but also stock availability.

**STRENGTHS & LIMITATIONS:** This indicator may be time-consuming to collect and, because of various names and generics used in different countries, may require some training to collect accurately.

**Table 14. Global Core List of Medicines Included in WHO/Health Action International Surveys\***

Indication	Medicine Name	Strength	Dosage
Asthma	Salbutamol	0.1 mg	Inhaler
Diabetes	Glibenclamide	5 mg	Capsule/tablet
Cardiovascular disease	Atenolol	50 mg	Capsule/tablet
Cardiovascular disease	Captopril	25 mg	Capsule/tablet
Cardiovascular disease	Simvastatin	20 mg	Capsule/tablet
Depression	Amitriptyline	25 mg	Capsule/tablet
Infectious disease	Ciprofloxacin	500 mg	Capsule/tablet
Infectious disease	Co-trimoxazole	8+40 mg/ml	Suspension
Infectious disease	Amoxicillin	500 mg	Capsule/tablet
Infectious disease	Ceftriaxone	1 g/vial	Injection
Central nervous system disease	Diazepam	5 mg	Capsule/tablet
Pain/inflammation	Diclofenac	50 mg	Capsule/tablet
Pain/inflammation	Paracetamol	24 mg/ml	Suspension
Ulcer	Omeprazole	20 mg	Capsule/tablet

\*Medications may have different spellings in different countries.



## ENVIRONMENT INDICATORS

The environment indicators in this section focus both on system health (e.g., species abundance and distribution) and on healthy, sustainable interactions between communities and their environments (e.g., area under improved management). While this section includes environmental outcomes, it also includes indicators that measure inputs, processes, and outputs. Indicator topics include habitat status; improved practices/management; NRM committees; and enforcement of environmental protection laws, climate-smart agricultural practices, and standardized climate change indicators. The environment indicators best-suited for individual PHE or environment programs will depend on program goals and resources. Table 15 lists the most common indicators in the HOPE LVB and Tuungane projects.

Environment-related work in PHE programs naturally complements efforts to improve governance by building capacity of local government bodies, and even communities, to manage shared resources in a sustainable manner for current and future revenue generation or livelihood purposes.

Several indicators in this section relate to farming and fishing, which is a main subsistence livelihood for many PHE program beneficiaries. Sustainable farming and fishing practices are important in any PHE program, especially those relating to soil and water conservation strategies, multi-cropping or agroforestry, protection of fish breeding sites, sustainable fishing, and agricultural strategies to adapt to climate change, such as the use of cover crops.

We have added five climate change indicators from USAID’s *2016 Global Climate Change Office Standard Indicator Handbook* (USAID, 2016). While the handbook contains many more indicators, we included the five that seemed the most viable for small to medium programs to collect and measure. Please refer to the rest of the indicators here: <https://www.climatelinks.org/resources/gcc-standard-indicator-handbook>.

These indicators cover process, output, and outcome indicators and are meant to be an illustrative, though not comprehensive, list of indicators to be used by your program’s M&E staff.

**Table 15. Commonly Used Environmental Indicators**

Indicator	HOPE LVB	Tuungane
Hours of enforcement patrols logged/ # of illegal fishing patrols conducted	X	
Number of infractions recorded/illegal fishing incidents reported		X
Number of fish breeding sites demarcated and protected	X	X
Percentage of leadership positions held by women on community-based NRM committees/number of NRM committees that include women in their constitution or memorandum of understanding	X	
Number of trees planted	X	
Tree survival after 1st growing season/survival rate of trees planted	X	
Number of households utilizing a fuel-efficient stove	X	
Species density/diversity	X	
Number of farmers trained on climate-smart agricultural practices		X

## PERCENTAGE OF COMMUNITIES IN TARGET AREA THAT HAVE DEVELOPED A COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT PLAN



LEVEL OF MEASUREMENT: Output.

DEFINITION: Community-based NRM plans take place in community settings and involve community members participating in formal discussions about the plan. Community-based NRM plans have elected members for drafting, finalizing, and implementing/enforcing the decisions set forth in the plan.

An NRM plan is a written document, agreed to by an NRM committee, that proposes changes in the management of local natural resources. Examples of a plan include the following:

- A regional land use plan with details on the permitted yield that can be taken by area or volume
- Guidelines on permitted harvest levels, stock size, gender, and age of species harvested
- Guidelines on seasonal quotas or restrictions in the use of natural resources
- A forest management plan with details on the allowable annual number of trees permitted to be cut, the minimum diameter of the trees to be cut, and the maximum number of trees to be harvested per hectare

CALCULATION:

$$\frac{\text{\# of communities in the target area that have a community-based NRM plan}}{\text{Total \# of communities in the target area}} \times 100$$

DISAGGREGATION: By target area.

PURPOSE: Community-based management integrates the ecological, social, and economic dimensions of land/marine protection management, encouraging ownership and responsibility at a local level. Community involvement increases the likelihood of linking local economic development and conservation goals. This indicator measures the coverage of the project in the target area for the development of NRM plans. An implemented NRM plan should ultimately lead to better management and protection of the project's natural area or habitat.

DATA SOURCES: Project records, secondary records (e.g., NRM plans).

TIME FRAME: Semi-annually, annually.

DATA COLLECTION CONSIDERATIONS: Communities should be asked about completed plans, plans currently in development, and plans proposed for the future. The plan is not counted toward this indicator until it is considered completed.

STRENGTHS & LIMITATIONS: This indicator is easy to collect with readily available data. However, community-based NRM is not easy and takes time and resources. Development of a plan does not mean it will be implemented or implemented effectively.

## NUMBER OF OFFICERS TRAINED ON LAWS AND ENFORCEMENT PROCEDURES AND POSTED TO A PERMANENT ENFORCEMENT POSITION



LEVEL OF MEASUREMENT: Process/Output.

DEFINITION: This indicator is defined as the total number of new and in-service officers trained in laws and enforcement procedures and posted within a 12-month period.

An enforcement officer is someone who protects a habitat and its resources by participating in law enforcement activities. The officer could be participating in a community-based enforcement program and need not be affiliated with an official park or police service. Duties may include protecting habitat integrity; preventing illegal logging, fishing, hunting/poaching, wildlife trade, or resource extraction; preventing pollution; preventing physical encroachments on protected lands; and fining and prosecuting violators.

“Officially trained” means that the officer has been trained to local standards and, when it is the norm in a region, has the full legal right and capacity to act in the position of a government-recognized enforcement officer. A target area is defined as the legally protected physical area where the enforcement officer will work.

The goal of this indicator is to measure whether new officers have been certified or trained before they receive their posting or whether permanent officers are trained in enforcement procedures.

CALCULATION: None.

DISAGGREGATION: By new and in-service officers, target area (if desired).

PURPOSE: Enforcement activities and results are used to measure the capacity to actually protect areas and species and to ensure that community NRM plans are respected. This is an indicator of the likelihood of preventing illegal deforestation, hunting, and other prohibited activities by having trained officers posted in the appropriate areas.

DATA SOURCES: Project records.

TIME FRAME: Quarterly.

DATA COLLECTION CONSIDERATIONS: The quality or length of training will vary by area. The meaning of “trained” should be specifically defined to meet a local standard. If projects collaborate with local authorities, authorities should be contacted to verify the postings.

STRENGTHS & LIMITATIONS: The number of trained officers may be an indication of improved commitment at a local, regional, or national level to enforce laws regarding the protection of animals and natural resources. However, this indicator does not take into account how many hours per week the officers work, the amount of corruption and violence in the region, and how likely it is that the officers are committed to doing, or even able to do, their job safely. The overall amount of enforcement funding and the amount and quality of available equipment will also determine what enforcement officers can achieve. This indicator neither measures the quality of training nor takes into account the turnover rate (i.e., how many officers are leaving or quitting per year compared to how many officers are retained or newly added).

## PERCENTAGE OF COMMUNITIES WITH FUNCTIONING COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT COMMITTEES



LEVEL OF MEASUREMENT: Process.

DEFINITION: An NRM committee is defined as an organized group of people who represent a defined geographic or political area and have the goal of improving management of the natural resources in the defined political or geographic area in which they reside. A functioning committee is defined as one that meets regularly at a defined periodicity (e.g., once a month).

CALCULATION:

$\frac{\text{\# of communities in the target area that have functioning community-based NRM committees}}{\text{Total \# of communities in the target area}} \times 100$
---

DISAGGREGATION: By target area.

PURPOSE: It is assumed that the most effective NRM will arise from those communities that have active, functioning committees. This indicator can measure the extent to which this project activity is being implemented in the community. Once the project introduces the process and assists in the establishment of an NRM committee, this indicator will measure community ownership and dedication to the process.

DATA SOURCES: Secondary records.

TIME FRAME: Annually.

DATA COLLECTION CONSIDERATIONS: This indicator measures the functioning of the committee, not of the NRM plan. The presence of the project (i.e., asking to see meeting notes and to attend meetings) may change the way the committees function and may be an incentive for the committees to meet regularly.

STRENGTHS & LIMITATIONS: The independent functioning of a committee is a governance value-added indicator. The fact that the committee is meeting on a regular basis shows a continued commitment to NRM. The committee is defined as functioning if meeting regularly, but this does not indicate the quality of the meetings, whether the committee has the needed expertise to develop an environmentally sound plan, and whether the committee has made progress in drafting or finalizing an NRM plan.

## PERCENTAGE OF YOUTH PARTICIPATING ON COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT COMMITTEES



LEVEL OF MEASUREMENT: Output/Process.

DEFINITION: “Participation of youth” is defined as youth ages 15–24 regularly attending NRM committee meetings. Regular attendance means being present and counted as a participant at each meeting (apart from occasional illness or need for absence). The frequency of meetings is determined in advance by the committees and in consultation with the project managers.

CALCULATION:

$$\frac{\text{\# of community youth ages 15–24 participating on the NRM committees}}{\text{Total \# of youth ages 15–24 in the community}} \times 100$$

DISAGGREGATION: By community.

PURPOSE: The percentage of youth participating on the committees is important because it reflects an ongoing, generational commitment and interest in the work of the committees. Monitoring this indicator can indicate the project’s need to discuss more open policies toward youth participation or to create strategies with the community to increase youth participation in making decisions on the use of natural resources. There is the potential for youth to act as leaders in behavior change communication and adoption.

DATA SOURCES: Secondary sources (meetings notes with participants listed, membership lists).

TIME FRAME: Annually.

DATA COLLECTION CONSIDERATIONS: Qualitative interviews with youth may also be used to assess their perceptions of involvement in the committees and to obtain more details on how youth are contributing to the committees. For instance, youth may not be participating or attending meetings because of the timing of the meetings, especially if they are held during school hours or after school when the youth may be doing homework or other chores. The increase or decrease in the percentage of youth participating may be due to a variety of factors that should be considered and investigated.

STRENGTHS & LIMITATIONS: Being involved in the committee does not necessarily ensure that youth have the same power and decision-making ability as adults do. There may be cultural factors that prevent or inhibit the youth from speaking up or challenging the views of others.

## PERCENTAGE OF LEADERSHIP POSITIONS HELD BY WOMEN ON COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT COMMITTEES



LEVEL OF MEASUREMENT: Output/Process.

DEFINITION: A leadership position is any position that needs to be applied for and a vote taken to determine who is elected to the position, resulting in the chosen person having commanding authority or influence.

CALCULATION:

$$\frac{\text{\# of women with a leadership position on the NRM committees}}{\text{Total \# of available NRM leadership positions}} \times 100$$

DISAGGREGATION: By community.

PURPOSE: Women and men have different gender-based roles and responsibilities; different knowledge of, access to, and control over natural resources; and different opportunities to make decisions that affect environmental management. For example, in some regions, men are much less involved, or not involved at all, in gathering, carrying, or providing water or firewood for household use and activities such as weeding and planting. Therefore, men may not appreciate the importance of these limited resources. Often, an NRM committee made up of only men makes decisions on issues that affect primarily women, such tasks that are typically completed by women. This indicator reflects gender equity and the ability of women to have a decision-making role in committee plans, actions, and control of resources. Differences in gender, age, and ethnicity may influence the use of natural resources. Increased participation of women on community-based NRM committees may lead to decreased local inequities, if gender equity and a leadership role for women is promoted. Exclusion of women may marginalize them from assets such as water or forest products and training, credit, or other benefits that go only to the committee members.

DATA SOURCES: Secondary records (i.e., membership and officers lists).

TIME FRAME: Annually.

DATA COLLECTION CONSIDERATIONS: Qualitative interviews with women may also be used to assess their perceptions of involvement in the committees and to obtain more details on how women are contributing to/involvement in the committees. In these interviews, women can be asked for exact details of the responsibilities of their leadership positions.

STRENGTHS & LIMITATIONS: If women become empowered and more involved in decision making and community-based group activities, this may lead to their input in not only decisions about natural resource use but also decisions about such topics as education, health, and family planning. However, holding leadership positions does not necessarily ensure that women have the same power and decision-making ability as men do. There may be cultural factors that prevent or inhibit the women who have leadership positions from speaking up or challenging the views of others. Reserving a certain number of leadership positions for women will not be effective if women play only a ceremonial role and stay silent.

## PERCENTAGE OF COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT PLANS THAT ARE APPROVED BY A GOVERNMENT AUTHORITY



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: NRM is the management of all activities that use, develop, or conserve air, water, land, plants, animals, and ecosystems. NRM committees are organized groups of people who meet regularly and attempt to practice NRM. A government authority is a person who works for the government and has the power to make legal decisions. “Approved” means the plan has been officially adopted as having the effect of law (i.e., is enforceable).

CALCULATION:

$$\frac{\text{\# of community-based NRM plans approved}}{\text{Total \# of NRM plans produced}} \times 100$$

DISAGGREGATION: None.

PURPOSE: Community control at the local level can result in more sustainable environmental management in which locals are likely to benefit from their choice of land or natural resource use. Often, natural resources are owned or controlled by the state or commercial interests, even when local or indigenous people have occupied a territory for many years or generations. When local communities have the legal right to manage local resources, they begin to value the resources, leading to ongoing conservation.

DATA SOURCES: Secondary records.

TIME FRAME: Annually.

DATA COLLECTION CONSIDERATIONS: Examining secondary records, such as legal documents, may be sensitive in some countries. The project should work with the local NRM committee and government authorities to receive documentation for this indicator.

STRENGTHS & LIMITATIONS: Measurements should be relatively easy and straightforward to obtain since the indicator is unambiguous and has been legally defined. However, changing laws and policies can be a slow process, often occurring over several years and requiring ongoing monitoring. Although a community-based NRM plan may not have been approved by a government authority, it may still be being implemented by the community. This indicator does not reflect whether management has improved on a local level.

## NUMBER OF VALIDATED INFRACTIONS REPORTED IN DEPUTY LOGS



LEVEL OF MEASUREMENT: Output.

DEFINITION: This indicator measures the total number of infractions reported by officers (or community members) and approved as authentic by a supervisor. Infractions are defined as illegal violations that are discovered by enforcement officers and officially recorded in officers' logbooks. Validated infractions are those infractions that are verified by a designated supervisor as authentic. The decision as to what to consider authentic should be based on the plausibility of the reported infraction and, whenever possible, evidence such as the confiscated goods, photos of the violation, or actual fines/penalties collected. Supervision to validate infractions and support officers should occur monthly or, at a minimum, on a quarterly basis and may be provided by the project manager.

CALCULATION: None.

DISAGGREGATION: By community-reported (if desired).

PURPOSE: This is an indicator of how well illegal deforestation, hunting, and other prohibited activities are controlled or prevented. The number of community-reported violations may indicate a local group effort and commitment to natural resource conservation. Validating infractions may prevent false or overreporting of enforcement activities and is an indication of the level of supervision the officers received in their work. This indicator demonstrates progress toward improved governance, which is a key aspect of value-added programs.

DATA SOURCES: Secondary records, project records.

TIME FRAME: Quarterly.

DATA COLLECTION CONSIDERATIONS: When appropriate (i.e., where projects are working closely with government authorities), information may need to be jointly collected from project and government records. Officers should be given a space in their logbooks or on a standardized infraction report to record their total number of daily infractions, nature of each infraction (e.g., species affected), location of the infraction (using GPS when possible), and details on how the infraction came to their attention (e.g., community-reported), number of perpetrators, description of the perpetrators, quantity of resources affected, and what the final result was (e.g., caught the perpetrators in the act, perpetrators had already fled the area). Supervisors should use these logbooks to record their assessments of the reported infractions and whether they validated the infractions.

An increase in infractions could indicate more effort from the officers, increased illegal activity in the area, or a combination of the two. If collected fines are used as a measure of validation, this indicator will be lagging since it may take months or years for the fines to be collected.

STRENGTHS & LIMITATIONS: The ability to validate an infraction depends, in part, on the nature of the infraction and on how dangerous the field conditions are. In some cases, it may be possible to bring in confiscated wildlife products as evidence of an infraction. In other cases, this may not be possible because of remote field conditions. It is also important that the project does not give rewards or benefits associated with increased infractions, to avoid creating incentives for officers to falsify records of infractions.



## HOURS OF ENFORCEMENT PATROLS LOGGED



LEVEL OF MEASUREMENT: Output.

DEFINITION: Hours of enforcement patrols logged is defined as the total number of cumulative hours that all officers are in the field participating in enforcement activities in a given period. Enforcement activities may include routine monitoring of the target area, specific site inspections for suspected violations, writing up warnings and infractions for confirmed violations, participating in the prosecution and case against violators, and confiscating illegally taken resources. “Logged” means that the officers recorded their patrols in an official register that they either keep with them or have held at the station.

Enforcement patrols can be undertaken by boat, foot, or vehicle. The amount of enforcement needed depends on the number/type of entry points into the protected area and the level of threat to the area. Thus, it may not be possible to compare enforcement between areas by using only the hours of patrols.

CALCULATION: Aggregation of hours.

DISAGGREGATION: By target area (if desired).

PURPOSE: The total number of patrol hours spent in the field will be directly related to the proportion of all violations that are actually discovered. Effective enforcement is essential to allow areas to reach their potential in protecting and preserving resources and species. Hours logged indicate a commitment on the part of the enforcement officers or their commanding bodies to enforce rules and regulations.

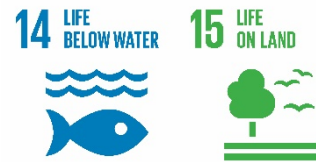
DATA SOURCES: Secondary records (i.e., logbooks), project records.

TIME FRAME: Monthly.

DATA COLLECTION CONSIDERATIONS: The logbooks should have sections where officers can record the date, hours spent on patrol, exactly when the patrol hours occurred (e.g., daytime or evening), the exact portion of the target area they were working in, total distance covered (using GPS data when possible), and the exact nature of their job for that day (i.e., if they were primarily involved in an anti-logging patrol, a sea-patrol, or a general patrol for any type of violation). These logbooks or forms should be standardized for all officers so that the same data points are collected and can be easily accumulated at the end of each month.

STRENGTHS & LIMITATIONS: Data are easy to collect, assuming that there is a logbook for enforcement officers to record their activities. This is a reflection of the actual effort in the field. However, the recorded time spent on patrol does not necessarily reflect the quality of the patrol activity since quality may depend on many things, such as the motivation and resources of the officers. The terrain of an area may limit enforcement activities or the number of hours spent on patrol; if the area is mountainous or has harsh conditions, then less enforcement may occur.

## AREA OF LEGALLY PROTECTED HABITAT



LEVEL OF MEASUREMENT: Output.

DEFINITION: “Legally protected” means that the area is being shielded from damage or destruction by a legal authority. Many levels of legal protection exist, allowing for a diverse range of acceptable or prohibited activities. Examples of protected areas include marine or forest reserves, no-take zones, sanctuaries, parks, locally managed resource-protected areas, strictly protected areas/nature reserves/wilderness areas, and national or state parks.

An “area” is defined as a geographical region with defined boundaries based on legal status. For land areas, this is measured in hectares. One hectare is 10,000 square meters. (Acres are more commonly used in the United States and Canada, where 1 hectare = 2.471 acres.) For marine areas, square nautical miles or square kilometers are used to measure area. (Nautical square miles are more commonly used in the United States and Canada, where 1 square kilometer = 0.292 nautical square miles.)

Habitat is the natural, physical home or range of wildlife species. Protected areas are difficult to develop in isolation and should not stand alone. A protected area will rarely succeed unless it is embedded in, or is so large that it makes up, an integrated ecosystem management strategy.

CALCULATION: By aggregation of area.

DISAGGREGATION: By specific marine/forest reserve area.

PURPOSE: Habitat fragmentation occurs when external disturbances cause large intact habitats to be divided into smaller units, often resulting in adverse ecological effects. Protected areas are a form of spatial environmental management and are needed to provide areas where fish/wildlife can spawn/breed and grow to their adult size and to maintain ecosystem goods and services such as clean drinking water. They can help accelerate the recovery of already depleted populations, as well as protect healthy, intact populations of species.

Protected areas may lead to direct human benefits, such as increased yield or size of fish, wildlife, or other extracted products. Overall management generally improves due to the shift in focus from single species to an ecosystem. Protected areas also provide a “control” against which to compare areas that are affected to a greater extent by human activities, and this information can be used to further inform and improve resource management.

DATA SOURCES: Secondary records (i.e., laws, natural resource management plans).

TIME FRAME: Annually.

DATA COLLECTION CONSIDERATIONS: Examination of legal documents may be sensitive in some countries. However, as this is an indicator of a legally protected habitat, these data should be available from policymakers, ministries, or other government sources. Other forms of legal documents, such as contracts with local communities or local authority agreements, are also sources of these data. Further sources may include formal agreements between local, regional, or national authorities and NGOs or foundations.

STRENGTHS & LIMITATIONS: Measurement of this indicator should be relatively easy and straightforward to obtain since the indicator is unambiguous and has been legally defined. However, progress on this indicator may be slow, as changing laws and policies may occur over several years. Also, protected areas only fulfill their purpose when they are actually protected, which may require significant enforcement efforts. Additionally, this indicator does not reflect the location of the protected area and whether the area protects key species or biodiversity hot spots.

## NUMBER OF FISH BREEDING SITES DEMARCATED AND PROTECTED



LEVEL OF MEASUREMENT: Output.

DEFINITION: This indicator measures the number of fish breeding sites in the program/target area that are protected and demarcated by the NRM committees, law enforcement, or community groups.

CALCULATION: None.

DISAGGREGATION: None.

PURPOSE: The demarcation and protection of fish breeding sites is extremely important for sustainability of fish populations. Many households in coastal areas throughout the world rely on fishing for their main source of income and livelihoods. Fish breeding grounds that are protected ensure that fish populations are restored, and fish can grow to full size and produce more eggs for future fish populations. Successful fish breeding protection sites have shown that these protected areas greatly improve not only the fish population but also other aquatic species as well as the ocean ecosystem. Additionally, household income and livelihoods may improve as a result of both sufficient recoveries of fish stocks for subsequent fishing seasons and the ability to catch larger fish for sale at markets.

DATA SOURCES: Program records.

TIME FRAME: Quarterly or annually.

DATA COLLECTION CONSIDERATIONS: Regular program records should be kept to monitor this indicator. Data can be collected and analyzed on a quarterly or annual basis depending on the fish breeding seasons.

STRENGTHS & LIMITATIONS: This indicator can be a difficult indicator to capture in that it attempts to gather information on fish breeding sites that are both demarcated and protected. It may be advisable to capture this indicator as two separate ones for ease of data collection and analysis. It may be difficult to understand sites that are “protected” and what that means in the particular program area. Several groups may be tasked with protection, including law enforcement, NRM committees, community groups, and community enforcement.

## NUMBER OF TREES PLANTED



LEVEL OF MEASUREMENT: Process/Output.

DEFINITION: This indicator is a count of the trees (i.e., plants, seeds, saplings) planted by species. Native tree species are likely to be more tolerant of local weather, pest, and soil conditions and will be of greater benefit to wildlife than non-native trees. Non-native trees may invade other areas, crowd native vegetation, and adversely affect ecosystems. The type of tree planted and in what area depends on the specific geographic location and project and community goals. The areas targeted by the project for replanting/regeneration should be determined in advance and remain fixed throughout the project.

CALCULATION: None.

DISAGGREGATION: By tree species, geographic area.

PURPOSE: Monitoring the number and species of trees planted measures the project's success toward longer-term results, such as increasing the area of secondary forest regenerated, and may indicate a reduction in encroachments into primary, virgin forest. Secondary forests can provide many of the products that people traditionally obtained from primary forests, while providing some of the environmental benefits that primary forests offer. Trees provide other benefits to humans, such as shade and energy conservation, reduced soil erosion, and wind and noise buffering, while also providing wildlife habitat. Trees that produce fruits or nuts can provide food for many species of wildlife as well as for humans. In addition, tree planting can be a community education and engagement activity that builds community awareness and appreciation for forest resources. Lastly, increasing the natural diversity of trees will provide habitats for additional wildlife species and make it less likely that a single pest or disease will wipe out all the trees.

DATA SOURCES: Project records, transect surveys.

TIME FRAME: Quarterly, annually.

DATA COLLECTION CONSIDERATIONS: The project should keep detailed logbooks on the numbers and species of seedlings or trees planted, the specific locations where plantings occur, the dates of plantings, and data on climate and pest outbreaks. In addition, data should be kept on the number of tree nurseries or woodlots in the target area and seedlings or tree survival rates after one or two years, as assessed by transect surveys.

STRENGTHS & LIMITATIONS: The number of trees planted should be readily available through project records. However, the number of trees planted is not an indication of the tree survival rate, tree diversity, or suitability for local wildlife and conditions.

## TREE/SEEDLING SURVIVAL AFTER FIRST GROWING SEASON



**LEVEL OF MEASUREMENT:** Outcome.

**DEFINITION:** The survival rate should correspond to the same geographic area as the place where the trees were planted. The defined target area is the area that is considered in need of regeneration and is predetermined by the project. “Surviving” is defined as being alive at the end of a predetermined period. The exact period will vary by species.

**CALCULATION:**

$$\frac{\text{\# of trees planted at the beginning of the growing season that survived}}{\text{Total \# trees planted at the beginning of the growing season}} \times 100$$

**DISAGGREGATION:** By tree species, target area.

**PURPOSE:** Monitoring the number of trees surviving measures the project’s potential to achieve the ultimate goal of increasing the area of secondary forest regenerated. Secondary forests can provide many of the products that people traditionally obtained from primary forests, while providing some of the environmental benefits that primary forests offer. Trees provide other benefits to humans, such as shade and energy conservation, reduced soil erosion, and wind and noise buffering, while also providing wildlife habitat. Trees that produce fruits or nuts can provide food for many species of wildlife as well as for humans.

This indicator is an intermediate step between planting and actual forest regeneration. This indicator is important because actual forest regeneration may take many years. During this time, this indicator can assess if plantings are effective (i.e., whether the project is planting suitable species, whether local conditions are conducive to tree survival). For example, if a project is planting a tree species that does not do well in the target location, then the project will become aware of this when measuring tree survival, rather than waiting the many years needed to assess actual forest regeneration.

**DATA SOURCES:** Transect surveys, project records.

**TIME FRAME:** Annually.

**DATA COLLECTION CONSIDERATIONS:** As described in the previous indicator, the project should keep detailed logbooks on the numbers and species of seedlings or trees planted; the specific locations of planting; the dates of planting; and data on climate, pest outbreaks, illegal logging, and fires. When choosing which types of trees to plant, information on the rate of growth and time needed for a tree to reach its full height and growth will determine how often this indicator should be assessed.

Data collection methods will depend on the size of the target area. For small areas, transects done on foot may be possible to assess the number of surviving trees. For large areas, it may be necessary to do field surveys by vehicle over larger areas or to measure survival only in randomly selected plots and then extrapolate results to the total target area. Plot sampling occurs when a specific plot or quadrant is identified and studied.

**STRENGTHS & LIMITATIONS:** If the project has kept careful records and is working in a small area, this indicator should be simple and inexpensive to collect. However, the tree survival rate doesn’t account for tree diversity or suitability for local wildlife. The number of surviving trees may be affected by factors outside the control of the project, including weather conditions, disease outbreaks, insect or animal pests, illegal logging, fires, and human uses of the forest. The number of surviving trees may also

be affected by things under the project's control, such as the suitability of the chosen species to the local climate and conditions; the time of year when planting was done; and the quality and storage of the initial plants, seeds, or seedlings.

## NUMBER OF HOUSEHOLDS USING A FUEL-EFFICIENT STOVE



LEVEL OF MEASUREMENT: Output.

DEFINITION: Fuel-efficient stoves are enclosed and often employ an elbow shape to provide a combustion chamber and insulation to increase the heat available to cook food. They conserve heat and have a chimney/vent to divert toxic smoke out of the cooking area. The specific type of fuel-efficient stove varies; therefore, the type of stove to be included in the measurement of this indicator should be determined by the project in advance. Traditional indoor cooking stoves are associated with exposure to harmful air pollution. Fuel-efficient stoves function by burning wood more slowly and increasing the amount of heat trapped and effectively used. These features reduce total cooking time and produce less smoke.

CALCULATION: None.

DISAGGREGATION: None.

PURPOSE: Switching to fuel-efficient stoves can have direct impacts on both forest and human health by limiting wood collection and ecosystem disruption and by minimizing human exposure to pollutants and related acute respiratory diseases (especially among women and children). Use of fuel-efficient stoves is thought to reduce household fuel wood use by 50 percent to 70 percent. In addition to the environmental benefits, reducing the time needed to collect firewood each week and the time needed for cooking may free up time for essential health, education, and income-generating activities, especially among women and girls. In areas where people buy firewood, the money saved may be invested in other important areas. Stoves may also provide other advantages such as additional indoor heat for families, more bathing opportunities, and increased hygiene/less disease, reduced risk of burns as compared with open fires, and a reduction in back/neck injuries due to carrying heavy firewood. Many designs of fuel-efficient stoves have also been linked to a reduction in the incidence of ARI by reducing the amount of indoor air pollution created by traditional biomass fuel-burning stoves.

DATA SOURCES: Population-based surveys, project records.

TIME FRAME: Annually or at baseline and end line.

DATA COLLECTION CONSIDERATIONS: There are several possible iterations of this variable that include a count of stoves distributed or sold. Those can be used if population-based surveys or access to the home for observation is not possible. Additionally, observations of use of the stove are ideal, as there are documented instances of a fuel-efficient stove being used as a second stove and not replacing the traditional stove. This should be considered when collecting this variable.

STRENGTHS & LIMITATIONS: Observation of the fuel-efficient stove in the household would be a proxy indicator of stove use. However, there have been documented instances of a fuel-efficient stove being used alongside a traditional stove as a second stove. This indicator does not measure the existence of a mechanism in the target area for timely repairs/maintenance to ensure that the stoves are kept in use. The size and style of each stove should be designed for the specific setting (e.g., country, region, house size/layout, cultural preferences) where it will be distributed.

## AVERAGE HOUSEHOLD CONSUMPTION OF FIREWOOD IN TARGET AREAS



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This measurement reflects the forest impacts resulting from fuel-efficient stove distribution and also reflects how much time people need to invest in firewood collection.

At the beginning of project implementation, weigh or measure the volume of several “typical” bundles of firewood in order to calibrate this measurement accurately. For cases in which the size/weight of bundles is not known, time spent collecting firewood can be used as a proxy.

CALCULATION:

$\frac{\text{Volume or weight of a typical bundle of firewood collected} \times \text{\# of bundles a household collects per week}}{\phantom{\text{Volume or weight of a typical bundle of firewood collected} \times \text{\# of bundles a household collects per week}}} \times 100$
This number will reflect a week’s worth of collected firewood. To measure over a longer period, multiply by the number of weeks required,

DISAGGREGATION: None.

PURPOSE: This indicator provides information on the local deforestation rate for fuel needs. Switching to fuel-efficient stoves can have direct impacts on the forest by reducing wood consumption. Use of fuel-efficient stoves is thought to reduce household fuel/wood use by up to 50 percent. The need to collect firewood may pressure people to use protected areas for this purpose illegally, leading to conflicts with enforcement officers and demands on the officers’ time. Reducing overall firewood consumption may also benefit protected areas and species conservation. Also, reduction of firewood for household use may have positive effects on respiratory health.

DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years (seasonally).

DATA COLLECTION CONSIDERATIONS: Surveys should ask how much firewood is collected on a weekly basis (e.g., volume of a typical bundle collected and how many bundles are collected per week), if any firewood is bought rather than collected, what the firewood is used for (e.g., cooking, heating, lighting, burning bricks), and what areas of the forest the firewood is taken from. It may also be desired to have data on the age, gender, and other details of who collects the firewood.

STRENGTHS & LIMITATIONS: When the size of an average bundle is known in advance, this is an accurate measure of consumption at a household level and is not complicated to collect. However, firewood may still be used for purposes besides cooking. Trends in firewood consumption over time may vary due to external factors that have nothing to do with the type of stove distributed.



## NUMBER OF EDUCATIONAL SESSIONS ON IMPROVED AGRICULTURAL/ MARINE PRACTICES



**LEVEL OF MEASUREMENT:** Input.

**DEFINITION:** This measures the total number of times the project's community educator teaches or works with farmers or fishers on improved practices. Each formal or informal visit with the farmers or fishers should be counted using predetermined criteria (e.g., length of time spent, discussion of a specific message or method). An improved agricultural/marine practice is any technique that provides additional human health and environmental benefits or does less harm to human health and the environment compared with previously used techniques.

Examples of improved practices include use of green manure as a fertilizer, reductions in pesticide use, implementation of agroforestry systems, use of sustainable extractive reserves, use of less destructive aquaculture techniques, a switch to less harmful fishing equipment, and a ban on intrusive boats. The type of practice introduced by the project generally depends on the geographical setting and pre-existing practices in that setting. Introducing the improved agricultural or marine practices in the target area means there is an organized effort to train and teach local people about the new methods and how they can be adopted. The specific practices measured in this indicator should be determined by the project in advance.

**CALCULATION:** None.

**DISAGGREGATION:** By type of improved agricultural or marine practice, geographic area (if desired).

**PURPOSE:** Improved agricultural/marine practices are especially important where large areas are under human use and cannot remain in, or return to, a natural state. Such practices can increase the yield of products, generate additional income, protect wildlife, and prevent soil erosion and water pollution.

Human health can also benefit as the result of increased crop yields, more food, better nutrition, increased income and money available to spend on family well-being and reduced chemical exposures among farm families/workers.

**DATA SOURCES:** Project records.

**TIME FRAME:** Monthly or quarterly.

**DATA COLLECTION CONSIDERATIONS:** The project's community educator should have a logbook where this information is recorded and reported monthly to the project manager. For each visit, the logbook should include the date, location, type of practice introduced, or message relayed, length of time of the visit, farmers/fishers targeted (including names, if possible), whether permission from the farm owner has been granted, and type of agricultural/marine practice currently in use. A form should be developed that is standardized and used by all project community educators for easy comparison and assembling of information across the project. Other items of information can be added to the standardized form as fits the specific needs of the project.

**STRENGTHS & LIMITATIONS:** This indicator allows for regular monitoring of implementation of the project's efforts to educate farmers/fishers and to introduce improved agricultural/marine practices into an area where destructive practices may currently be in use. For cases in which a community's NRM plan includes implementing improved agricultural/marine practices, this indicator is also useful in monitoring the progress of efforts to improve management. However, this indicator does not assess adoption or practice of new knowledge and skills. Care must be taken not to assume that a new practice is necessarily

“improved.” Best practices for agricultural/marine production may vary greatly by geography and economic setting.

## PERCENTAGE OF FARMERS/FISHERS WHO ADOPT IMPROVED AGRICULTURAL/ MARINE PRACTICES



**LEVEL OF MEASUREMENT:** Outcome.

**DEFINITION:** This indicator measures actual use of improved agricultural/marine practices that the project has introduced. “Adopt” means practice or use the improved practices. A farmer refers to any person who works on or owns a farm. A fisher refers to any person who catches fish or other marine species for human consumption.

**CALCULATION:**

$$\frac{\text{\# of farmers/fishers using improved practices}}{\text{Total \# of farmers/fishers targeted for improved practice adoption}} \times 100$$

**DISAGGREGATION:** By type of improved agricultural/marine practice, target area (if desired).

**PURPOSE:** Monitoring only the educational sessions held or the practices introduced does not indicate whether the practice has been adopted. This indicator will assist the project in better measuring the outcome of its efforts to introduce improved agricultural/marine practices.

**DATA SOURCES:** Population-based surveys of farmers/fishers, project records, direct observation for project records.

**TIME FRAME:** Annually or corresponding with agricultural/marine harvesting cycles, every two to five years for surveys.

**DATA COLLECTION CONSIDERATIONS:** Data collection strategies and the surveys will need to be altered for specific types of farming/fishing (e.g., fruit, vegetable, grain, meat, dairy, fish, seafood). To reduce recall bias, data collection may need to occur several times a year to coincide with cropping/fishing cycles.

Surveys should include such information as date, position of the person providing the information (e.g., farm owner, farm worker, fisher), types and extent of use of previous practices, types and extent of use of current practices, types and extent of use of practices being considered for the future, type of farming/fishing, and size of the operation (e.g., total area of farm or area fished or the number of farm/fishing employees). Questions for this section should be adapted for the specific type of farming or fishing, and for whether the improved practice introduced by the project has been used once, consistently, exclusively, or over the long-term (with specific time frame specified). Determining the total number of farmers or fishers living or working in the defined target area may be straightforward for small, well-known areas but may be considerably more difficult for large, dispersed target areas. Use of an improved practice should be monitored over time (e.g., yearly) to see if farmers/fishers are simply trying out improved practices or if they are more permanently switching to the improved practices over time.

**STRENGTHS & LIMITATIONS:** This indicator measures the percentage of farmers/fishers who adopt improved practices, yet the decision of what agricultural practices to use for a large area may be controlled by just one farmer if he owns the land being worked. In this case, measuring the farms that adopt improved agricultural practices may be more useful. Similarly, a fisher working for a large commercial establishment might not be able to make independent decisions on resource practices.

## AREA OF HABITAT UNDER IMPROVED MANAGEMENT



LEVEL OF MEASUREMENT: Output.

DEFINITION: Improved management means that the community is implementing a community-based NRM plan for the area. To qualify for this indicator, community plans can be at any stage of completion but should be underway. This could mean that natural resources were not previously managed or that existing management has been improved or expanded. Habitat is defined as a geographical region with defined boundaries that is targeted for improved management. Boundaries may be based on legal, locally recognized, cultural, political, or geographic factors.

Examples of activities in improved management plans include regenerating forest through tree planting; regenerating and protecting coral reefs; using selective logging plans; maintaining a habitat in a way that prevents soil erosion, preserves water resources, protects against natural hazards, or maintains other key ecosystem functions; leaving designated areas for conservation; utilizing forest tree genetic resources and seed production; leaving designated areas for wildlife species; and protecting key marine breeding waters and beaches.

CALCULATION: The area measured is the total area covered (e.g., cumulative hectare total from year to year) by the implemented plan per community, municipality, or key biologically important ecosystem or region, whether a marine or forest habitat. For land habitats, area should be measured in hectares. One hectare is 10,000 square meters. (Acres are more commonly used in the United States and Canada, where 1 hectare = 2.471 acres.) For marine habitats, area should be measured in square nautical miles or square kilometers. (Nautical miles are more commonly used in the United States and Canada, where 1 square kilometer = 0.292 nautical square miles).

DISAGGREGATION: By geographic area covered by the NRM plan (if desired).

PURPOSE: Improved forest or marine habitat management leads to a healthier environment and positively affects the species that depend on the environment. Areas must be managed to balance both immediate human needs and long-term environmental health. Increasing the area of improved management or establishing new areas under improved management is an indication of a project's success at the outcome level.

DATA SOURCES: Secondary records (i.e., NRM plans), transect surveys, key informant interviews, mapping.

TIME FRAME: Annually.

DATA COLLECTION CONSIDERATIONS: Clearly defining "improved management" based on the criteria of the specific project and its interventions is integral to the meaningfulness of this indicator. The habitat measured should be defined in advance, as the project's target area and the change in land or marine area under improved management is tracked over time.

In some cases, the total area of the target region may already be known (e.g., for a national park). In other cases, the area of the target region may need to be measured via walk-through or by plane or boat to measure the distances.

The existence of a management plan does not count toward this indicator. Although the existence of a plan could be a first step toward improved management, it does not indicate that the plan is being implemented. Implementation can be measured by the regular monitoring of habitat and species conditions, or by enforcement mechanisms put in place to implement rules and regulations.

STRENGTHS & LIMITATIONS: Demonstrating improved habitat management can indicate implementation of community-based approaches to developing NRM plans. However, determining “improved management” can be subjective. NRM plans may vary greatly in quality, implementation, supervision, and enforcement. Moreover, measuring the physical area of a region under community management may be time-consuming and difficult.

## POPULATION STRUCTURE OF SPECIES



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: Species monitoring should include assessments of species' population structure (e.g., breeding, mortality, age), taking into account spatial and temporal changes. The most appropriate indicators for monitoring species' population structure will vary depending on the threats to the local species of interest and the life stage the threat is most likely to affect. When baseline knowledge is sufficient and the main local threats are fully known, the most effective monitoring should focus on the life stage most affected by the threat. A combination of short- and long-term indicators (e.g., nest monitoring over time, change in the proportion of occupied territories) are needed.

Population structure measures will vary depending on the species. Specific measures may include den or nest occupancy rates during the breeding season, territory occupancy and re-occupancy rates, nesting status, number of eggs in a nest, average number of offspring produced per territory size in hectares, fledgling or cub survival, sex ratios of offspring, ratio of pre-adults to adults, age-specific survival, and number of adults in a population. All of these would need to be measured repeatedly over time.

DISAGGREGATION: By type of species, target area (if desired).

PURPOSE: Changes in wildlife health may serve as early warnings for factors that can also affect human health. Reproductive health is especially sensitive to threats (e.g., pollutants, lack of sufficient food or water, changes in predator dynamics). Thus, measuring the reproductive health of species can provide an early warning of potential problems. Species that are successfully breeding and maintaining their numbers are an ecological indicator of ecosystem health. The number of breeding species is generally related to the available area of land. Thus, these indicators serve as measurable surrogates for the health of the environment.

Population structure and reproductive health/behavior may be susceptible to changes in a particular environmental stressor or reductions in a key resource. Species monitoring can detect ecosystem disturbance before it is too severe. If species can grow to maturity and increase in overall numbers (i.e., richness) and abundance, then this may lead to increased reproductive potential.

DATA SOURCES: Transect surveys, existing species data, qualitative interviews with the community, catch and release (e.g., to measure sex ratios of offspring), radio/satellite tracking of species (e.g., to identify where dens or nests are), observation (e.g., of nests, dens, other breeding sites, stationary viewing towers).

TIME FRAME: Every two to three years.

DATA COLLECTION CONSIDERATIONS: Occupancy and nesting/breeding status may be measured by visiting and looking into nests, dens, or other known breeding sites each year. Trained observers record signs of breeding (e.g., nest building) or signs of reproductive activity. Population-wide marking or telemetry may also be used (e.g., affixing transmitting collars to selected species); however, this is expensive and is usually only done for large, charismatic, and endangered species. Great care must be taken to avoid disturbing species, altering their normal behavior, or driving them away from a particular location.

New methods may need to be developed, especially for species that have not previously been monitored. It may be necessary to monitor a species for at least two years to determine whether changes are related to human activities.

STRENGTHS & LIMITATIONS: Data collection for these indicators has the potential to be very expensive and impractical. It may be possible to use existing data if some organizations are already

tracking the health of key endangered wildlife. Species monitoring requires expertise and may be difficult, costly, and time-intensive. Detectable changes in some indicators (e.g., body size) may lag far behind the threat, such as habitat degradation. There is the risk that the indicator may detect threats too late (e.g., when a habitat has become too degraded to support viable populations).

## AREA OF SECONDARY FOREST REGENERATED



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This involves the total area (in hectares) of regenerated, secondary forest. Secondary forest is forest that has previously been logged or destroyed. Regeneration is defined as any regrowth or renewal of forests or stands of trees by natural (i.e., being left alone) or artificial (i.e., via seed, sapling, or tree planting) means after a temporary condition reduced the primary forest to less than 10-percent canopy cover. An area of forest regeneration is defined as a geographic region with defined boundaries where trees were planted or where the area was left undisturbed for regeneration purposes. Boundaries may be based on legal, locally recognized, cultural, or geographic factors (e.g., a mountain range or a river).

CALCULATION: None.

DISAGGREGATION: By type of forest (if desired), target area.

PURPOSE: Secondary forest provides refuge to diverse species by providing food and refuge. Conservation of secondary forests may be an effective investment in future wildlife diversity since species recover relatively rapidly in secondary forests. Land-use practices based on secondary forests play a critical role in sustainable management and biodiversity conservation. Humans may also benefit from less soil erosion, improved watershed protection, less pollution from runoff, and increased income opportunities related to forest tree products such as fruits or latex.

DATA SOURCES: Transect surveys, plot sampling, mapping, project records.

TIME FRAME: Annually.

DATA COLLECTION CONSIDERATIONS: When measuring what percentage of the total target region has been regenerated, it may be necessary to also do walk-throughs, drive the perimeter, or fly over the area to measure the distance. Physical surveys should use repeated transects with sample areas chosen randomly if all areas will not be measured. Plot sampling, in which a specific plot or quadrant is identified and studied, can also be completed.

STRENGTHS & LIMITATIONS: Some measurements, such as the number of trees replanted and the total amount of land replanted, should be readily available. However, this indicator does not measure the usefulness/appropriateness of the regenerated forest. It may not be a productive forest, and it may not support much biodiversity if the right mix of species is not planted. External factors such as climate conditions can affect this indicator.



## SPECIES RICHNESS



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator measures the total number of species found during surveys in a defined area.

The species chosen for measurement in this indicator will be project- and site-specific. Species richness is the most important component of species diversity. Despite the conclusions of many ecologists that species richness by itself is inadequate as a measure of species diversity, many programs use species richness as the only measure of species diversity. Species monitoring should include data collection on the total number of selected species in a defined target area, taking into account temporal changes.

DISAGGREGATION: By type of species.

PURPOSE: Changes in the numbers of species may serve as early warnings for factors that can also affect human health. Species that are successfully maintaining their numbers are an ecological indicator of ecosystem health. Land-use change, climate change, and human activities such as fishing or hunting may affect the number of species in a region. Habitat conversion or fragmentation may lead to declines in the total number of species in a region or in certain species in particular.

DATA SOURCES: Transect surveys.

TIME FRAME: Every two to three years.

DATA COLLECTION CONSIDERATIONS: The best representative umbrella species are those that have the largest area requirements and the most diverse habitat requirements. These are species that may protect many others with smaller ranges. A selection of species with different habitat requirements should be chosen for monitoring, including seed dispersers, seed predators, food chain predators, and pollinators that affect local ecosystem structure, productivity, and resilience. It is important not to choose species for monitoring that are relatively scarce and have large geographic ranges, because environmental changes affecting one habitat type or location are less likely to influence the total number of these species.

STRENGTHS & LIMITATIONS: Species richness is often a good surrogate for other measures of biodiversity that are more difficult to measure directly. Species identification is usually straightforward, except in some less-studied regions where baseline knowledge is inadequate. Species richness is related not only to the health of wildlife and the ecosystem but also to income-generating opportunities such as ecotourism. However, accurate estimation of total numbers of species requires expertise and may be difficult, costly, and time-intensive. Few standard data may initially be available for baseline comparisons. Methodologies for species monitoring may need to be newly developed for some species. Measuring species richness requires surveys of large sample sizes to achieve valid results. Large-scale species monitoring is usually expensive and difficult to implement and maintain. However, monitoring fewer, selected species usually costs less and is easier to implement and maintain.

## SPECIES ABUNDANCE AND DISTRIBUTION



**LEVEL OF MEASUREMENT:** Outcome.

**DEFINITION:** Species abundance is a reflection of the total number of an individual species in a defined geographic area. Species abundance is the average number of a specific species found in a given area (e.g., per hectare, square kilometer, square mile); this is an indication of how common a given species is. The distribution of an individual species is defined as the geographic or spatial area within which that species can be found. Within any area, the spatial distribution of a particular species may be clustered in one location or may be more evenly distributed throughout the area.

Species' abundance and distribution are key components of species diversity. When the pattern of diversity in protected areas or target areas is described only by the total number of different species (i.e., richness), the relative population size and geographic range (i.e., whether species are relatively rare or common) can be missed. Therefore, a more comprehensive species monitoring effort should include data collection on the number of selected species in a defined target area as well as mapping of the species' geographic distribution, taking into account temporal changes such as seasonal or breeding patterns. Selection of the most appropriate species for monitoring abundance and distribution will vary depending on the species' populations and local threats.

**CALCULATION:**

$$\frac{\text{\# of individuals of a specific species identified in a survey of the target area}}{\text{Total target area surveyed}} \times 100$$

**DISAGGREGATION:** By type of species, targeted area.

**PURPOSE:** Preserving species diversity is critical to ecosystem health and function, including energy fixation, chemical cycling, soil maintenance, ground water purification and access to clean drinking water, protection against flooding, and maintenance of healthy populations of pollinators. Monitoring species abundance and locations can provide early warning of changes in conditions that may negatively affect biodiversity overall and may pinpoint critical areas and species to focus on.

Large wildlife species are often the most affected by human activities because they have large habitat and nutritional requirements, are seldom found in high densities, and have relatively low reproductive rates. The goal is to maintain or increase species abundance of prominent groups of species within natural variation. Collecting data on trends in abundance may help guide project management decisions.

**DATA SOURCES:** Transect surveys, mapping, secondary records (existing species data).

**TIME FRAME:** Every two to three years.

**DATA COLLECTION CONSIDERATIONS:** This indicator may be easiest to measure in national parks or other defined areas, or in confined or small areas. Exact methods will vary greatly depending on the species that are being surveyed and the terrain. Ideally, samples should be collected using a variety of methods and should span a diversity of habitats, species, and seasons. Great care must be taken to avoid disturbing species, altering their normal behavior and activities, or driving them away from a particular location.

New methods may need to be developed, especially for species that have not previously been monitored. Monitoring of species over at least two years is thought necessary to determine whether change in abundance is related to human activities. A decrease in abundance or in observed distribution, along with

a decrease in the average body size, may indicate that the species is being overharvested.

**STRENGTHS & LIMITATIONS:** Identification of species is usually straightforward, except in some less-studied regions where baseline knowledge is inadequate. Species abundance and distribution is related not only to the health of wildlife and the ecosystem but also to income-generating opportunities, such as tourism. However, accurate estimation of species abundance and distribution requires expertise and may be difficult, costly, and time-intensive. Detectable changes (e.g., changes in distribution) may lag far behind the threat, such as habitat degradation. There is a risk that the indicator may detect threats only after it is too late (e.g., when a former habitat has become too degraded to support viable populations).

## NUMBER OF SMALL FARMS USING SOIL AND WATER CONSERVATION TECHNOLOGIES



LEVEL OF MEASUREMENT: Output.

DEFINITION: This indicator is used to understand if small-farming households are adopting sustainable water and soil conservation techniques for their agricultural land. Various types of soil and water conservation techniques are available to many small farmers such as drip irrigation, water storage, irrigation scheduling, the use of drought tolerant crops, composting and mulching, and the use of cover crops or polyculture.

CALCULATION: None.

DISAGGREGATION: None.

PURPOSE: Various soil and water conservation technologies in use today throughout the world vary from traditional to sophisticated. These technologies or techniques are important in both climate change mitigation and climate change adaptation. For mitigation, these techniques help to reduce soil erosion and enhance nutrients to the soil. For adaptation, they help to efficiently use scarce water resources and diversify crops for enhanced resilience to external shocks or climate variability.

DATA SOURCES: Transect surveys, project records, population-based surveys.

TIME FRAME: Every two to five years or at baseline and end line.

DATA COLLECTION CONSIDERATIONS: The type of techniques that will be observed depend on the techniques that are the focus of the program or intervention. Not all methods will be appropriate for each agricultural area, so they must be adapted. Data for this indicator can be collected through observations via a transect survey, through project records of household visits (if this is part of the program activities), or through a population-based survey at a household level.

STRENGTHS & LIMITATIONS: While this indicator is useful to understand if small-farming households are adopting new techniques or technologies for soil or water conservation, it does not capture how well these are being carried out or to what extent they are conserving water or soil through agricultural uses.

## NUMBER OF CROP SPECIES IN AGRICULTURAL USE IN PROJECT/PROGRAM AREA



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator measures crop diversity through the number of unique crop species cultivated for agricultural use within the program catchment area.

CALCULATION: None.

DISAGGREGATION: By growing region/zone (if the program is operating in multiple regions or agricultural growing zones).

PURPOSE: Crop diversification is important for environmental and livelihoods outcomes. Crop diversity is important to help mitigate the effects of climate and rainfall variability for small-farming households, in addition to mitigating soil erosion and soil degradation. Diversifying crop species on agricultural land can also assist in increasing biodiversity, thus making the land less susceptible to crop diseases and pests. Additionally, crop diversity helps to mitigate vulnerability to external shocks to small-farming households, such as climate change and weather variability.

DATA SOURCES: Transect surveys, population-based surveys, mapping.

TIME FRAME: Every two to five years or at baseline and end line.

DATA COLLECTION CONSIDERATIONS: Depending on the size of the program's catchment area, the total number of agricultural crop species may not be available to survey. In this case, use a sample of household agricultural land for data collection. These data can be collected through the use of a transect survey, a population-based survey, or mapping (i.e., community mapping). In a transect survey, the information would be mainly observed through the transect walk. In a population-based survey, the information would be gathered through household surveys. Through mapping, this information could be gathered by creating a community map with members of the community. The data gathered through any of these methods should be gathered at the same time of year to alleviate any seasonal differences in agriculture.

STRENGTHS & LIMITATIONS: Different crops and cropping methods may be used during different times of the year. Additional information may need to be gathered to understand the average number of crop species in agricultural use. The indicator is very useful in understanding both climate change adaptation and mitigation tactics, but also to understand livelihoods outcomes in terms of small farmers' use of income diversification.

## PERCENTAGE OF FARMING HOUSEHOLDS PRACTICING MONOCULTURE CROPPING

13 CLIMATE ACTION



15 LIFE ON LAND



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator measures the percentage of small-farming households within the program’s catchment area that are producing only one type of agricultural crop species.

CALCULATION:

$$\frac{\text{\# of farming households that are only producing one type of agricultural crop species on their land}}{\text{Total \# of farming households in the target area}} \times 100$$

DISAGGREGATION: None.

PURPOSE: Monoculture cropping is the practice of growing the same crop species on the same land year after year. Many crops species produced year after year on the same plot of land will quickly deplete the soil nutrients if not planted with diverse types of crops to regenerate the soil (such as nitrogen-enhancing legumes). Additionally, growing only one type of crop species leaves the household open to vulnerability in the event of an extreme drop in market prices or a pest or disease affecting the crop.

DATA SOURCES: Transect surveys, population-based surveys, mapping.

TIME FRAME: Annually or at baseline and end line.

DATA COLLECTION CONSIDERATIONS: There may be farming households in your program area that are engaged in more than one livelihood activity. It is advisable to choose households for this indicator that rely on farming for their MAIN source of income. Depending on the size of the program’s catchment area, the total number of households engaged in small-holder farming may not be available to survey. In this case, a sample of households may be used for data collection and reporting on this indicator. These data can be collected through the use of a transect survey, population-based survey, or mapping (i.e., community mapping or aerial mapping). In a transect survey, the information would be mainly observed through the transect walk. In a population-based survey, the information would be gathered through household surveys. Through mapping, this information could be gathered by creating a community map with members of the community, or through aerial photography that could be ground-truthed through a sample of observations. The data gathered through any of these methods should be gathered at the same time of year to alleviate any seasonal differences in agriculture.

STRENGTHS & LIMITATIONS: While this indicator is indicative of unsustainable agricultural practices and vulnerability at the level of household income, different crops and cropping methods are often used during different times of the year. Additional information may need to be gathered to understand if monoculture is a common or regular occurrence, or a response to an external shock or seasonal need. The indicator is specifically aimed at gathering data on whether the same crop is produced on the same plot of land year after year, which may be difficult to obtain.

## NUMBER OF FARMING HOUSEHOLDS UTILIZING COVER CROPS



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator captures the number of households within the target/program area that utilize cover crops for increasing crop production, weed suppression, and water and soil conservation.

CALCULATION: None.

DISAGGREGATION: By age and sex of household head.

PURPOSE: Cover crops (and subsequently green manure) are valuable crops grown by farmers around the world and serve various important purposes. Most often, cover crops are used for nitrogen fixation of the soil to reduce the need for long fallow periods on plots of land. Additionally, cover crops reduce the amount of water needed for certain crops by covering the bare ground to reduce both runoff and evaporation, which is extremely useful in arid environments and for increasing climate variability. Cover crops also assist in naturally suppressing weeds for crops and soils that are susceptible to them. Studies have recently shown that cover crops can suck carbon pollution from the air. Lastly, cover crops are often used as green manure, thus adding organic materials back into the soil to improve soil health.

DATA SOURCES: Population-based surveys, transect surveys.

TIME FRAME: Every two to five years or at baseline and end line.

DATA COLLECTION CONSIDERATIONS: Capturing data on this indicator will require the data collector to collect the data from farms during the same growing season from year to year. This indicator may have to be collected over various seasons in the beginning, to understand different cropping cycles in the particular program areas.

STRENGTHS & LIMITATIONS: There may be seasons when cover crops are not used in the program area, so it is advisable that the data collection team visit farming sites throughout the year to understand various cropping cycles. There may be farmers who use cover crops, but only at certain times of the year; this will have to be addressed prior to data collection and analysis.

## NUMBER OF FARMING HOUSEHOLDS PRACTICING AGROFORESTRY

LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator captures the total number of farming households (i.e., those households that report farming as their main source of income) that practice any form of agroforestry. Agroforestry refers to a method of farming or cropping that utilizes trees together with various crops or animal husbandry.

CALCULATION: None.

DISAGGREGATION: By age and sex of household head.

PURPOSE: Agroforestry is a dynamic and sustainable farming system used for many purposes, including increasing the diversity of a household's diet, maximizing output from a small-farming area, and improving the ecosystem and soil health by choosing crops that enrich and conserve the soil and water resources.

DATA SOURCES: Project records, transect surveys, population-based surveys.

TIME FRAME: Every two to five years or at baseline and end line.

DATA COLLECTION CONSIDERATIONS: This indicator can be collected through two main methods: a population-based survey in which households are interviewed, or a transect survey and observation to collect information on households practicing agroforestry. While the indicator itself is easy to capture, the ability to identify the agroforestry system may be challenging for some data collectors. Having clear guidelines and examples for data collectors will be advantageous.

STRENGTHS & LIMITATIONS: While agroforestry is a very valuable practice, particularly in the PHE community, this indicator may not capture how well the agroforestry system is set up on a particular farm, or if the households are gaining any additional benefits from it, such as increased dietary diversity, increased income, or soil health. The indicator, however, is a mid-term outcome and a proxy for increased well-being through diet, nutrition, income, and conservation.





## AREA OF LAND THAT HAS CHANGED STATUS FROM NATURAL TO AGRICULTURAL LAND



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator measures the total area of land (in hectares) that has changed from land in its natural state (forest or grassland) to agricultural land over a specified period.

CALCULATION: Aggregation of total area

DISAGGREGATION: By region (if appropriate).

PURPOSE: Most of the population in developing countries depends on subsistence or traditional farming for their livelihoods. With population growth and unsustainable farming practices (e.g., slash-and-burn agriculture), land will continue to be changed from its natural state into land for agricultural use (of various types of agriculture). Measuring this change will be important to understand the long-term outcomes of a PHE and livelihoods program.

DATA SOURCES: Transect surveys, population-based surveys, mapping.

TIME FRAME: Every two to five years or at baseline and end line.

DATA COLLECTION CONSIDERATIONS: Depending on the size of the program's catchment area, the total area of land may not be available to survey. These data can be collected through a transect survey, a population-based survey, or mapping (i.e., community mapping). In a transect survey, the information would be mainly collected through the transect walk, by observing the area of land that has changed use. In a population-based survey, the information would be gathered through household surveys. In mapping, this information could be gathered by creating a community map with members of the community; or, the most reliable method would be to gather aerial photographs of the program's catchment area before and after the intervention, or at regular intervals throughout the program, if possible. The data gathered through any of these methods should be gathered at the same time of year to alleviate any seasonal differences in plant coverage.

STRENGTHS & LIMITATIONS: The best method for capturing and monitoring these data is through the use of remote sensing or aerial photography, though that may be prohibitively expensive for many programs. Small changes can be seen with high-resolution photography and monitored not only or change in usage (e.g., from natural to agricultural land) but also for other environmental degradation due to climate change or severe weather events that may alter the land.

## NUMBER OF PEOPLE TRAINED IN CLIMATE CHANGE ADAPTATION

13 CLIMATE ACTION



LEVEL OF MEASUREMENT: Output.

DEFINITION: This indicator captures the extent of programmatic climate change adaptation training.

CALCULATION: None.

DISAGGREGATION: By age and sex of household head.

PURPOSE: Climate change adaptation refers to increasing the resilience of natural or human systems to actual or anticipated impacts of climate change. This indicator focuses on the delivery of training that was made possible by the program funding and resources.

DATA SOURCES: Project records and training records.

TIME FRAME: Annually.

DATA COLLECTION CONSIDERATIONS: This indicator can be collected by project records or by training records or registers. Only people who complete the entire training course should be counted in this indicator.

STRENGTHS & LIMITATIONS: Training or the attendance of a training or series of courses does not necessarily translate directly into operation of the climate change adaptation practices.

## NUMBER OF INSTITUTIONS WITH IMPROVED CAPACITY TO ASSESS OR ADDRESS CLIMATE CHANGE RISKS

13 CLIMATE ACTION



LEVEL OF MEASUREMENT: Output.

DEFINITION: This indicator captures the extent to which institutional capacity to assess or address climate change risks has increased or been built because of program funds or resources. Relevant institutions may refer to national, subnational, or regional organizations; NGOs or civil society organizations; or private organizations.

CALCULATION: None.

DISAGGREGATION: By type of institution.

PURPOSE: The purpose of this indicator is to track global or regional progress in building institutional capacity to address climate change adaptation.

DATA SOURCES: Institutional records.

TIME FRAME: Annually.

DATA COLLECTION CONSIDERATIONS: Indications of improved capacity include improved administrative or organizational capacity of institutions focused on climate change; greater resource/budget earmarks for climate change adaptation planning or action; improved access to equipment or data; increased use of data, information, or analysis for informing decisions or actions; and increased in-house capacity.

STRENGTHS & LIMITATIONS: This indicator can be difficult to understand if the institution has increased its capacity to address climate change risks. The various methods of data used to capture the indicator can only be used as a proxy indicator, at best.

## **AMOUNT OF INVESTMENT MOBILIZED/BUDGETED FOR CLIMATE CHANGE ADAPTATION BY NATIONAL, REGIONAL, LOCAL, OR INTERNATIONAL ORGANIZATIONS**

**13** CLIMATE ACTION



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator captures the amount of financial investments mobilized for climate change adaptation programs or projects from the public or private sector.

CALCULATION: None.

DISAGGREGATION: Type of funding.

PURPOSE: This indicator can help measure the increased will of the national, regional, local, or international community to fund and invest in climate change adaptation.

DATA SOURCES: Budgetary records, public source documents.

TIME FRAME: Annually.

DATA COLLECTION CONSIDERATIONS: Several different means can be used to collect these data, though some of the data may be proprietary or earmarked separately.

STRENGTHS & LIMITATIONS: Some records/budget information can be difficult to obtain from various organizations.

## GREENHOUSE GAS EMISSIONS REDUCED, SEQUESTERED, OR AVOIDED THROUGH CLEAN ENERGY ACTIVITIES

13 CLIMATE ACTION



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator reports the estimated quantity of greenhouse gas emissions reduced, sequestered, or avoided.

CALCULATION: The indicator is a calculated estimate and not the result of direct emissions measurements.

DISAGGREGATION: None.

PURPOSE: This indicator is used to document and communicate greenhouse gas mitigation results and inform relative progress toward long-term outcomes. Lowering greenhouse gas emissions will slow the rate of climate change and reduce climate change impacts.

DATA SOURCES: Project records and training records through implementing partners.

TIME FRAME: Annually.

DATA COLLECTION CONSIDERATIONS: The U.S. government has compiled a tool to help programs estimate their greenhouse gas emission sequestration; the tool is available here: <https://www.cleertool.org/>.

STRENGTHS & LIMITATIONS: This indicator may be difficult for small programs to calculate internally without external assistance. Some measurements needed to calculate it may be difficult to obtain through traditional program records.

## LIVELIHOODS INDICATORS

Livelihoods refer to the individual or household’s means of support or subsistence. Most often, when we refer to livelihoods within PHE programs, we are interested in activities that can generate income (e.g., vocation trainings, access to tools, technologies, credit/loans). We aim here, though not explicitly, to focus on sustainable livelihoods. According to the prominent thought leaders in sustainable development and livelihoods, Chambers and Conway (1992), a sustainable livelihood is “a livelihood [that can] cope with and recover from the stresses and shocks and maintain or enhance its capabilities and assets both now and in the future without undermining the natural resource base.”

For these indicators, we focus on the duality of the term sustainable and refer both to the ability of the livelihood to sustain shocks and reduce vulnerability, and to environmental sustainability in which the livelihood does not impinge on local or global natural and environmental resources.

Livelihoods indicators are integral to PHE programs; thus, we include a separate compendium of indicators focused on sustainable livelihoods here. Most people throughout the world rely on subsistence livelihoods, whether they be farming, livestock rearing, fishing, or small enterprises. The poor rely more heavily on environmental resources for their livelihoods, such as the land for farming and firewood and water sources for fishing. With few alternative income sources, the impact and demand on the environment will grow with population growth. Providing and supporting alternative income-generating activities as well as opportunities for sustainable livelihoods is an integral part of PHE program outcomes.

In this section, we describe indicators that support the creation of sustainable livelihoods and the outcomes associated with them. The main illustrative indicators in this section are in the areas of household food security, income generation, dietary diversity, income, and financial services. Table 16 shows the most common livelihood indicators in the HOPE LVB and Tuungane projects.

**Table 16 Commonly Collected Livelihoods Indicators**

Indicator	HOPE LVB	Tuungane
Yield per area per year/cropping cycle/fishing effort/ season	X	
Number of farmers/fishers aware of sustainable crop production/fishery management practices, technologies, and inputs		X
Number of households with access to financial services/members of a savings group		X

## NUMBER OF HOUSEHOLDS WITH HOME GARDENS/LIVE FENCES/HOME ORCHARDS



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator measures the number of households in the program catchment area that have home gardens, home orchards, or living fences within their homestead. Home gardens (also sometimes called kitchen gardens) refer to the use of land near the household structure or within the homestead that is used to cultivate annual and perennial plants for household consumption. Home orchards refer to a similar cultivation and land use, but specifically relate to fruit trees. Live or living fences refer to the cultivation of a plant species to use as a fence to keep predators out, to delineate parcels of land, to provide an additional source of food (or fodder for livestock), or to guard crop areas.

CALCULATION: None.

DISAGGREGATION: None.

PURPOSE: There are many benefits to home gardens/home orchards and living fences; thus, they are often used in PHE programs for both environmental and livelihoods purposes. Environmentally, home gardens/orchards and live fences can contribute to plant biodiversity as well as assist in controlling erosion and providing shade. In addition, all three of these methods serve the purpose of diversifying plant/crop species, thereby diversifying diets or income sources.

DATA SOURCES: Project records, population-based surveys.

TIME FRAME: Every two to five years or at baseline and end-line.

DATA COLLECTION CONSIDERATIONS: Data on home gardens/home orchards or living fences can be captured in several ways depending on your PHE program's activities. Project records may include information on home gardens that can be gathered through routine monitoring of activities or home visits. Additionally, this information can be captured during a population-based survey every two to five years or at baseline and end-line of the project.

STRENGTHS & LIMITATIONS: This indicator will be useful only in programs with a discreet program area, as it is a count of households. To track trends in progress, you will need to access and observe all of the households. If only a sample is available, you can convert this indicator to a percentage by collecting a denominator of your entire sample size. This depends on the size of your program area, the number of your beneficiaries, and the size of your M&E budget.

## NUMBER OF TRAININGS/WORKSHOPS HELD ON ALTERNATIVE LIVELIHOODS AND INCOME-GENERATING ACTIVITIES



LEVEL OF MEASUREMENT: Input.

DEFINITION: This count includes the total number of training/educational sessions provided by the project to introduce members of the community to new livelihood options. A new income-generating activity is any income strategy that was not practiced by the community previously. It is intended to diversify livelihoods, with a goal of local sustainability, by diversifying the income stream or providing livelihood alternatives to resource extraction and destruction.

Examples of new income-generating activities are numerous. They include any agricultural activity that is new to a community, such as home gardening, new crops or livestock, or alternative farming techniques. New activities can also involve fishing or forestry as well as tourism, handicrafts, micro-enterprises, and women's cooperatives. Alternative income-generating activities usually stem from skills the community already has or resources to which the community already has access.

CALCULATION: None.

DISAGGREGATION: By type of income-generating activity.

PURPOSE: Educational/training sessions are needed to provide the information, skills, confidence, and inputs people need to add or switch to a new income-generating activity. Rural populations need to be occupationally flexible, spatially mobile, and not dependent on agricultural income-generating activities alone to provide sufficient yields or income. Many of the people who live in areas with high biodiversity are poor and depend directly upon the products of a healthy ecosystem to meet their basic needs. Economic pressures increase the need to exploit natural resources and can lead to soil erosion and species loss. Poverty and lack of knowledge about alternative livelihoods are drivers of biodiversity loss.

Alternative farming/fishing techniques can lead to improvements for the environment, increased yields for market, better nutrition, and general family well-being. Sometimes communities develop nutritional deficiencies that result from depletion of essential local plant and animal species. Alternative income-generating activities that allow local species to recover can lead to availability of essential nutrients, if the species are managed in a sustainable way.

Training sessions may lead to the community's increased local capacity, empowerment, and ability to make group decisions about resources effectively. Livelihood diversification has the potential to positively affect poverty, income distribution, yields, nutrition, food security, health, capital assets, conservation of ecosystems and species, gender roles, and vulnerability (e.g., shielding communities from environmental and economic shocks, natural disasters, weather extremes and seasonality).

DATA SOURCES: Project records.

TIME FRAME: Monthly, quarterly.

DATA COLLECTION CONSIDERATIONS: The project's logbook should include the following information about the educational sessions: dates, length of training and total number of sessions, frequency, specifics on type of training, names of people who did the training, a list of training materials distributed, location of sessions, a breakdown of people in attendance (e.g., percentage of adults, percentage of women, names, ages, genders), and a list of any financial aid or resource inputs given to the community to help them make the change.

A standardized form can be developed that all project community educators use for easy comparison and assembly of information across the project. Other information can be added to the standardized form as



fits the specific needs of the project.

STRENGTHS & LIMITATIONS: These data are easy to collect through careful record keeping. However, using only the number of training sessions as an indicator does not allow assessment of the quality of the training or how well-equipped and empowered the participants feel after the sessions to diversify their income-generating activities.

## NUMBER OF FARMERS AWARE OF SUSTAINABLE CROP PRODUCTION PRACTICES, TECHNOLOGIES, AND INPUTS



LEVEL OF MEASUREMENT: Output.

DEFINITION: This indicator measures the reach of educational, outreach, or training programs on sustainable agriculture—the total number of small holder farming households that are aware of one or more sustainable crop production practices, technologies, or inputs. These may include intercropping, the use of cover crops or mulching, agroforestry, permaculture, drip irrigation, and composting. The types of sustainable production practices, technologies, and inputs will depend on your program’s activities.

CALCULATION: None.

DISAGGREGATION: By type of practice, technology, or input.

PURPOSE: Sustainable crop production practices are important for both climate change adaptation and resiliency. These practices assist farmers in water conservation (which reduces soil erosion and desertification) and improve the efficiency of limited resources such as fertilizers and human inputs.

DATA SOURCES: Key informant interviews, project records, pre-/posttests at educational sessions.

TIME FRAME: Quarterly, annually.

DATA COLLECTION CONSIDERATIONS: Complications in collecting this indicator with accuracy arise with regards to knowledge and awareness. Knowledge and awareness are difficult to measure objectively without the ability to perform pre- and posttests with the persons of influence. Using key informant interviews can assist in confirming information for this indicator. When possible, using an interview as a baseline and then repeating the interview at a scheduled interval can provide information over time about increased knowledge about or commitment to sustainable crop production strategies.

STRENGTHS & LIMITATIONS: This indicator captures knowledge of cropping practices only. It does not capture information on whether a farmer is supportive of the practices or whether the farmer plans to use this knowledge to change or improve practices.

## YIELD PER AREA PER YEAR/CROPPING CYCLE/FISHING EFFORT/ SEASON



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: Yield is the total amount of usable, edible, or sellable crop or marine product. This measures land or marine productivity.

### CALCULATION:

$\frac{\text{Amount of useable, edible, or sellable crop or marine product (by weight, volume, or number)}}{\text{Area planed with the selected crop (in hectares) or the marine area fished (in nautical square miles)}} \times 100$
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The numerator may be measured by weight, volume, or total number (for harvested crops/marine products). If farmers/fishers are paid by weight, volume, or total number for their crops or fish, then billing records may provide useful data on the numerator.

Volume may be measured in many ways (e.g., by bag, basket, cans, bundles, crates). It is important to standardize the volume measurement so that it represents the same, fixed quantity on average. This can be achieved by weighing or measuring the volume of several samples from each household or farm using a container of the same size to calibrate the measurement at the beginning. The volume measurement can also be standardized by collecting the data at the point of sale. To reduce recall bias, data collection should occur near the end of cropping or fishing cycles, which may be seasonal.

Hectares should be used to measure land area. One hectare is an area of 10,000 square meters. In the United States and Canada, an acre may be used (1 hectare = 2.471 acres). Square kilometers should be used to measure aquatic areas. In the United States and Canada, nautical miles are more commonly used (1 square kilometer = 0.292 nautical square miles).

DISAGGREGATION: By crop or marine product, geographic area.

PURPOSE: Project staff may need to know how the improved agricultural/marine practices affect the yields of farmers and fishers. Increased yields can lead to improved economic and health outcomes. Increased yields can also be linked with indicators that measure household income or child protein intake and nutritional status.

DATA SOURCES: Secondary sources (farmer or fisher reported estimates), farm surveys, project records.

TIME FRAME: Annually, or corresponding with crop/fish/product harvesting cycles.

DATA COLLECTION CONSIDERATIONS: The total area for all plots combined under each crop system should be calculated and the yield determined for each cropping system. Separate yields should not be calculated for each plot and combined. The denominator (i.e., the total area planted for land or total area fished for marine) can be measured by a transect survey for small areas, by aerial survey/photographs for larger areas (i.e., flying over area to measure distances or use of satellite images), or by traveling the distances by boat or via scuba diving for marine areas. At least one person experienced in this type of measurement should be involved in the denominator measurements.

Many farmers/fishers likely already measure their crop/marine harvests and may already have accurate measurements of the areas planted with specific crops or of the areas fished, so it is possible for existing data to be used. Farmer/fisher estimates may vary in accuracy. However, using the farmer/fisher estimate method is generally simpler, less expensive, and more efficient.

Data should also be collected on when specific crops or marine species are harvested throughout the year. Data collection should occur early in each planting or fishing season to measure the area planted or fished, and right after each harvest to measure yields.

**STRENGTHS & LIMITATIONS:** This indicator may not only provide data on the impacts of the improved resource practice but also serve as an incentive for farmers/fishers to continue with and expand the use of improved practices. Data are relatively easy and inexpensive to collect, especially since most farmers/fishers already measure their yields. This indicator is widely used in the coastal resource management field and is sometimes called “catch per unit effort.” However, external factors can affect the yield. Improved NRM practices do not necessarily result in increased natural resource yields.

## NUMBER OF HOUSEHOLDS WITH ACCESS TO FINANCIAL SERVICES



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator aims to capture information on household access to credit and loans. The indicator is the number of households within the program's catchment area that have access to financial services. These services are mainly credit and small loans, but other financial services may be added depending on the program's goals and activities.

CALCULATION: None.

DISAGGREGATION: By socio-economic status, sex of household head, size of credit or loan.

PURPOSE: Access to credit and loans has historically been difficult for small holder farming and the poor. However, small farmers and poor people generally do not have savings to draw from when needed; to use to purchase new agricultural technology or new implements; or to borrow from when there are droughts, illnesses in the family, or death. In these cases, poor people are highly vulnerable. Access to credit or loans to draw on when needed or to expand their capabilities is very important.

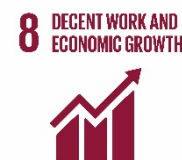
DATA SOURCES: Population-based surveys, project records, secondary sources.

TIME FRAME: Quarterly, every two to five years or at baseline and end-line.

DATA COLLECTION CONSIDERATIONS: Many different financial services may be available, but we are choosing to focus on small loans and credit. These may come from many sources, such as village savings and loans groups, farmer cooperatives, and national banks. It may be important to distinguish the level or type of financial services for your specific program. Secondary sources may be available from small village savings and loans organizations or farmer cooperatives to understand the breadth of coverage for these services within smaller catchment areas. In population-based surveys, it may be necessary to gather information not only on whether a household merely has access but also whether it utilizes those services, to what extent, and how often.

STRENGTHS & LIMITATIONS: Measuring access of households to financial services creates a few limitations. First, there are different levels of access that could be broken into various categories, such as high, medium, and low. Second, access to financial services can take many forms, such as having access to an institution or a financial product. Third, within a household unit, different members may have different levels of access (e.g., women, youth). Last, access to services does not necessarily mean there will be an uptake or desire to use these services.

## NUMBER OF SUSTAINABLE MICRO- OR SMALL BUSINESSES CREATED AS A RESULT OF A PHE-SPONSORED WORKSHOP OR TRAINING



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator aims to measure the number of new sustainable income-generating activities that have resulted in the creation of a small or medium business or enterprise in a given period (e.g., 6–12 months), and that are a direct result of a PHE-sponsored workshop or training event.

CALCULATION: None.

DISAGGREGATION: By sex of the business owner, formal or informal business.

PURPOSE: The purpose of this indicator is to understand if the given interventions or activities are developing new business and income opportunities for the beneficiaries of the program or the households and individuals in the program catchment area. New small businesses can help create secondary income sources as well as increase incomes, which would contribute to an increase in well-being indicators.

DATA SOURCES: Secondary data, population-based surveys.

TIME FRAME: Annually or at baseline and end-line.

DATA COLLECTION CONSIDERATIONS: Sustainable within this context should be defined for the specific scope of the program. There may be relevant secondary data that can be used to capture these data more frequently, such as government business filing records, membership lists, or banking records. This indicator does not differentiate between formal and informal businesses, so the program or intervention may aim to define a specific type of business for which this indicator could be tailored. For a population-based survey, it is recommended that multi-year programs add a midline assessment to have another data point for the evaluation.

STRENGTHS & LIMITATIONS: Understanding if the new employment opportunities or new businesses are directly related to the income-generating activities may be difficult. Additionally, the indicator as written does not disaggregate between types of businesses; if a specific income-generating activity is an aim of the program, then the indicator will have to be tailored to collect that information.

## NUMBER OF WOMEN WHO HAVE ATTENDED AN ALTERNATIVE LIVELIHOODS WORKSHOP OR TRAINING



LEVEL OF MEASUREMENT: Output.

DEFINITION: This indicator captures the total number of women attending/participating in an alternative livelihoods workshop or training sponsored by the PHE program. Alternative livelihoods refer to nontraditional livelihoods activities within the specified program area.

CALCULATION: None.

DISAGGREGATION: By age group.

PURPOSE: By teaching skills for alternative livelihoods, women can support their families and provide alternative and additional sources of income for the family. Additionally, alternative livelihoods can provide the household with resiliency to external shocks, such as market fluctuations for the traditional crop or product, as well as fluctuations in weather or rainfall patterns.

DATA SOURCES: Project records.

TIME FRAME: Quarterly or annually.

DATA COLLECTION CONSIDERATIONS: This indicator is easy to capture and analyze provided that there are registers and forms for collecting this information from workshops or trainings. Make sure that registers at trainings and workshops include a gender category so that the sex disaggregation is possible if the workshop or training is co-ed.

STRENGTHS & LIMITATIONS: While this indicator captures the number of women attending a training or workshop, it does not capture information as to what, if any, outcomes result from the women's attendance. It also does not capture the quality of the training or any other resources that may be provided during the training.

## MONTHS OF INADEQUATE HOUSEHOLD FOOD PROVISIONING



LEVEL OF MEASUREMENT: Output.

DEFINITION: The indicator measures the number of months over the past 12 months in which the household did not have enough food to meet all the nutritional and dietary needs of the household members. This indicator is also meant to take into account all means of food access, including household production, purchased food products, family and community food parcels, and food aid.

CALCULATION: This indicator is measured through a series of questions and can be used to create an average for the program area. First, the person in the household who is responsible for preparing food (who may or may not be the head of household) is asked if there was any time over the past 12 months that the household did not have enough food to meet its members' dietary and nutritional needs. If the respondent answers yes, ask him or her to list the months when he or she was unable to meet these requirements/needs. The indicator is calculated by adding up the number of months mentioned. An average for the program area can be calculated by taking the sum of all households in the catchment area or sample area divided by the total number of households in the same area.

DISAGGREGATION: None.

PURPOSE: This is a standardized indicator created by the Food and Nutrition Technical Assistance III Project (FANTA) and USAID as a food security indicator. It is a measure of household food access and food insecurity or vulnerability.

DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years or at baseline and end-line.

DATA COLLECTION CONSIDERATIONS: FANTA guidelines suggest gathering this information during times of food shortages (e.g., the lean or hunger months right before harvest seasons). This is thought to improve recall of months when there was a shortage of food in the households. Subsequent data should be collected at the same time of year for the most accurate results for comparison. The person in the household in charge of food preparation should be asked to complete this section of the household survey, as she or he will have the most accurate information to respond for all members of the household.

STRENGTHS & LIMITATIONS: In some regions and cultures, months are not used, as they are in the western Gregorian calendar. In this instance, your questionnaire should be adapted to the local context and standardized across program areas to enable comparison over time and across regions. Recall for the past 12 months may be difficult for some people, so it might be necessary to identify key events over the past year from which to gather the information. The strength of this indicator is that it is relatively easy to measure and requires little additional training for the data collector to collect high-quality data.



## HOUSEHOLD INCOME



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This is the total monetary amount of all combined household income for the month. This is equal to the total monetary market income paid to all household family members for crops, fish, products, or services for a given period minus the input, labor, and transportation and transaction costs, converted to U.S. dollars.

Income includes both goods and services that are sold, traded, exchanged, or performed for money. Goods are defined as the value and quantity of marketed goods from forest and other wooded land (or marine areas). Services are the value of market services in forest or marine areas (e.g., tourism, labor provided for logging) and services unrelated to natural resources (e.g., teaching).

DISAGGREGATION: By project, community, specific forest or marine products.

PURPOSE: The natural environment is an income source, and many livelihoods are directly linked to forests, fisheries, farming, and use of other natural resources, especially among the poor living in rural areas of developing countries. If managed properly, income from natural resources can reduce poverty over the long-term by providing increased household income, more secure livelihoods, and better education and health.

Total monthly household income reflects economic wealth and ability to buy needed items such as food and medicines or health care. The breakdown of income by specific forest or marine products can reflect local environmental degradation and how much of any particular resource is being exploited.

DATA SOURCES: Population-based surveys.

TIME FRAME: Monthly, quarterly, or annually (depending on design).

DATA COLLECTION CONSIDERATIONS: Data on income from households should be complemented by data on price, so price differentials between regions can be considered. Price data may be obtained from various sources including field visits/observations, particularly at markets, qualitative interviews, ecotourism records, harvest records, market records, cooperative registries and receipts, fishing records, and agricultural surveys. Depending on whether the local economy is formal or informal (or mixed), different approaches will be needed. Income will be in various local currencies. For comparisons, income needs to be converted into a common unit (e.g., U.S. dollars), and comparisons across time will need to account for inflation.

STRENGTHS & LIMITATIONS: Total income in dollars is a reflection of the market value for specific goods in the specific area and does not describe the total number of species or products extracted from the forest or marine ecosystem. Monthly data will better measure seasonality in income, but they are very expensive to collect.

## HOUSEHOLD DIETARY DIVERSITY



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator measures the count of different foods or food groups that were consumed during the previous 24 hours within the household unit.

CALCULATION: A standardized measure created by FANTA is the household dietary diversity score, which is found by first asking a household respondent to describe all foods eaten within the past 24 hours within the household (excludes food eaten outside of the house but is included at the individual level). After the 24-hour recall, a series of probes are used to make sure no foods were forgotten. The number of food groups is then counted for the household.

DISAGGREGATION: By individual (if desired) or by age groups (6–23 months is usually of high interest).

PURPOSE: Dietary diversity is considered one standardized way of measuring food security. While there are several others, a comprehensive indicator such as this was chosen for its ease of use, simplicity in interpretation, and relatively low burden to the respondent and the data collector. Due to the scope of many PHE programs that often include agro-environmental interventions (to improve crop diversity and land-use efficiency) as well as sustainable livelihoods interventions, a dietary diversity score is proposed here to be used for understanding sustainable agricultural practices as well as sustainable livelihoods interventions. Both, many believe, will contribute to increased dietary diversity that ultimately, many studies propose, and increase caloric availability at the household and individual levels.

DATA SOURCES: Population-based surveys. (See Figure 8 for an example of a survey instrument)

TIME FRAME: Annually (if possible).

DATA COLLECTION CONSIDERATIONS: Dietary diversity can fluctuate between seasons of the year, between growing seasons, or during the hunger season. It is important to gather information at the same time of the year within the same agricultural zone or region to be able to compare from year to year, household to household, or region to region. Extreme events such as market shifts in major commodities, droughts, flooding, or other weather events may acutely affect household and individual dietary diversity.

STRENGTHS & LIMITATIONS: A main strength of this indicator is that it is commonly used to understand food security. It is easy to use (i.e., doesn't require a specialized researcher), does not ask sensitive questions, is efficient, and imposes a low burden on the respondent and the data collector. It is also a stronger indicator for food security than many other composite-type indicators.

Limitations of this indicator include the fluctuation of food availability due to seasonal access, household shocks (e.g., injuries, illnesses), and other external factors; this can make comparisons difficult. Additionally, this indicator captures household dietary diversity and does not account for variability within the household; however, the method described above can also be employed with individuals within the household. Additionally, a 24-hour recall does not account for any abnormal eating habits, such as around holidays or during travel.

**Figure 8. Guidelines for Measuring Household and Individual Dietary Diversity**

<i>Guidelines for Measuring Household and Individual Dietary Diversity</i>			
Question number	Food group	Examples	YES=1 NO=0
1	CEREALS	corn/maize, rice, wheat, sorghum, millet or any other grains or foods made from these (e.g. bread, noodles, porridge or other grain products) + <i>insert local foods e.g. ugali, nshima, porridge or paste</i>	
2	WHITE ROOTS AND TUBERS	white potatoes, white yam, white cassava, or other foods made from roots	
3	VITAMIN A RICH VEGETABLES AND TUBERS	pumpkin, carrot, squash, or sweet potato that are orange inside + <i>other locally available vitamin A rich vegetables (e.g. red sweet pepper)</i>	
4	DARK GREEN LEAFY VEGETABLES	dark green leafy vegetables, including wild forms + <i>locally available vitamin A rich leaves such as amaranth, cassava leaves, kale, spinach</i>	
5	OTHER VEGETABLES	other vegetables (e.g. tomato, onion, eggplant) + <i>other locally available vegetables</i>	
6	VITAMIN A RICH FRUITS	ripe mango, cantaloupe, apricot (fresh or dried), ripe papaya, dried peach, and 100% fruit juice made from these + <i>other locally available vitamin A rich fruits</i>	
7	OTHER FRUITS	other fruits, including wild fruits and 100% fruit juice made from these	
8	ORGAN MEAT	liver, kidney, heart or other organ meats or blood-based foods	
9	FLESH MEATS	beef, pork, lamb, goat, rabbit, game, chicken, duck, other birds, insects	
10	EGGS	eggs from chicken, duck, guinea fowl or any other egg	
11	FISH AND SEAFOOD	fresh or dried fish or shellfish	
12	LEGUMES, NUTS AND SEEDS	dried beans, dried peas, lentils, nuts, seeds or foods made from these (eg. hummus, peanut butter)	
13	MILK AND MILK PRODUCTS	milk, cheese, yogurt or other milk products	
14	OILS AND FATS	oil, fats or butter added to food or used for cooking	
15	SWEETS	sugar, honey, sweetened soda or sweetened juice drinks, sugary foods such as chocolates, candies, cookies and cakes	
16	SPICES, CONDIMENTS, BEVERAGES	spices (black pepper, salt), condiments (soy sauce, hot sauce), coffee, tea, alcoholic beverages	
Household level only	Did you or anyone in your household eat anything (meal or snack) OUTSIDE the home yesterday?		
Individual level	Did you eat anything (meal or snack) OUTSIDE the home yesterday?		

Source: Food and Agriculture Organization, United Nations, 2011

## PERCENTAGE OF HOUSEHOLDS WITH AT LEAST ONE SECONDARY SOURCE OF INCOME

1 NO POVERTY

8 DECENT WORK AND ECONOMIC GROWTH



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator measures the percentage of households in which the household head reports that the household has at least one alternative source of income. This could be a current source in addition to the primary source of income, or could be a source to turn to in case of an external shock to the household or primary source of income.

CALCULATION:

$$\frac{\text{\# of households that report an alternative/secondary source of income}}{\text{\# of households in the program catchment area (or sample area)}} \times 100$$

DISAGGREGATION: By gender and age of the head of household, type of income source.

PURPOSE: The core of sustainable livelihoods is centered on the diversification of income, food sources, and household and individual resilience to external shocks (e.g., shifts in environment, market, commodity price) or inter-household shocks (e.g., injuries, illnesses, deaths). Households that have additional sources of income are inherently more resilient than those with a sole source of income, as they can shift from the primary source of income to a secondary source, or can supplement a primary source of income.

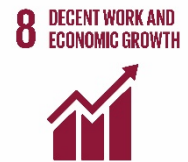
DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years or at baseline and end line.

DATA COLLECTION CONSIDERATIONS: The head of household should be consulted during the population-based survey to gather this information.

STRENGTHS & LIMITATIONS: This indicator is a strong proxy measure for household resiliency, though it can be subject to fluctuations during different seasons of the year (e.g., different agricultural cycles or rainy, dry, or lean seasons).

## NUMBER OF HOUSEHOLDS ENGAGED IN ALTERNATIVE LIVELIHOODS ACTIVITIES



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator captures the total number of households that are engaged in at least one alternative livelihoods activity. If desired, this indicator can be used specifically to capture those households that attended an alternative livelihoods training or workshop sponsored by the PHE program.

CALCULATION: None.

DISAGGREGATION: By type of alternative livelihood activity, sex, age of head of household.

PURPOSE: Alternative livelihoods offer households additional sources of income and help to reduce the effects of external shocks to the households' livelihoods sources (e.g., fluctuations in weather affecting crops or fish catches, fluctuations in the market). Alternative livelihoods are particularly important in PHE programs when the traditional livelihoods are ecologically destructive.

DATA SOURCES: Project records, population-based surveys.

TIME FRAME: Annually, every two to five years or at baseline and end line.

DATA COLLECTION CONSIDERATIONS: Households may be engaged in alternative livelihoods activities during only certain times of the year (e.g., during lean or dry seasons). Therefore, it may be advisable to capture this information at different times throughout the year to understand any seasonal affects or changes.

STRENGTHS & LIMITATIONS: This indicator does not capture what the monetary outcome of the alternative livelihood activity is or if the activity has a quantifiable positive affect on the household.

## PERCENTAGE OF HOUSEHOLDS WITH INCREASED INCOME DUE TO ALTERNATIVE LIVELIHOODS ACTIVITIES



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator measures the percentage of households that are actively engaged in an alternative livelihoods activity that report having gained an increase in household income due to the activity. If desired, this indicator can also help measure increases in household income related to a PHE-sponsored training or workshop.

CALCULATION:

$$\frac{\text{\# of households that report an increase in income due to engagement in alternative livelihoods activities}}{\text{\# of households engaged in alternative livelihoods activities}} \times 100$$

DISAGGREGATION: By sex and age of head of household.

PURPOSE: Alternative livelihoods offer households additional sources of income and help reduce the effects of external shocks to the households' livelihoods sources (e.g., fluctuations in weather affecting crops or fish catches, fluctuations in the market). Alternative livelihoods are particularly important in PHE programs when the traditional livelihoods are ecologically destructive. Increased income generated by a household engaged in alternative livelihoods activities, as a longer-term outcome-level indicator, can show the success of these trainings and workshops.

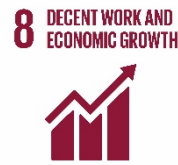
DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years or at baseline and end-line.

DATA COLLECTION CONSIDERATIONS: Households may be engaged in alternative livelihoods activities during only certain times of the year (e.g., during lean or dry seasons). Therefore, it may be advisable to capture this information at different times throughout the year to understand any seasonal affects or changes.

STRENGTHS & LIMITATIONS: Some alternative livelihoods activities (e.g., agricultural products) may need to take place for several seasons before a monetary return can be seen. Additionally, alternative livelihoods activities may result in positive well-being outcomes. Although these would not be reflected in monetary terms, they would still be considered important outcomes.

## NUMBER OF FARMING HOUSEHOLDS THAT ARE MEMBERS OF FARMING COOPERATIVES OR PRODUCER ORGANIZATIONS



LEVEL OF MEASUREMENT: Output.

DEFINITION: This indicator measures membership in rural farming cooperatives or rural producer organizations. Rural producer organizations and farming cooperatives help small farmers gain access to credit, agricultural inputs, and markets.

CALCULATION: None.

DISAGGREGATION: By type of organization or cooperative, sex and age of head of household.

PURPOSE: Active membership in small-farming cooperatives and or rural producer organizations has been shown to correlate to an increase in market access, agricultural inputs, and access to credit or small loans. Thus, membership in these organizations or cooperatives can ultimately improve agricultural outputs or income from agricultural activities.

DATA SOURCES: Secondary sources (membership lists or dues schedules), project records, population-based surveys.

TIME FRAME: Quarterly, every two to five years or at baseline and end line.

DATA COLLECTION CONSIDERATIONS: The households that are included in your program's catchment area or intervention area may not necessarily be members of local organizations or cooperatives, but instead national or regional groups or cooperatives. Understanding what kind of producer groups or cooperatives small farmers in your program areas are operating and how they affect the households in your program area may be more useful than knowing about members of regional or national groups.

STRENGTHS & LIMITATIONS: Membership in an organization or cooperative does not necessarily equate to active participation in the organization or cooperative. Additionally, different cooperatives and organizations are of different quality and effectiveness. Thus, this indicator is limited to membership and does not imply quality or effectiveness of the cooperative or organization.

## INTEGRATION INDICATORS

Integrated programs have several advantages over stand-alone PHE programs. Integrated programs are cost-effective and also have historically recruited more men to family planning efforts and more women and adolescents to environment/conservation efforts. Integrated programs also improve the perceived value of family planning efforts by packaging them with health interventions.

One of the main long-term goals of integrated PHE programs is to ensure local ownership and sustainability. Therefore, the outcome indicator “number of enabling local ordinances/policies/strategies/doctrines supporting PHE” is included in this section. Short-term outcome indicators in this section measure local PHE awareness (e.g., number of policymakers, media, and scholars knowledgeable about or aware of a specific PHE issue) or the diversification of PHE efforts.

Process indicators in this section measure linkages between materials (e.g., number of linked messages/materials created) and partnerships that increase integration (e.g., number of new PHE partnerships created that make linkages among organizations or institutions from different sectors). Output indicators in this section measure PHE promotion/education efforts (e.g., number and frequency of PHE educational sessions provided in the target community).

While any of the indicators in this section may be valuable for the M&E of integrated programs, programs that have a focus or limited budgets may concentrate on measuring a few indicators that best fit their needs. A list of the most commonly collected integration indicators can be found in Table 17.

**Table 17. Commonly collected integration indicators**

Indicator	HOPE LVB	Tuungane
Number of model households in project areas	X	X
Number of instances of population, health, or environment organizations addressing nontraditional audiences	X	
Number and frequency of PHE educational sessions provided in the target community/ PHE messaging in the community through village health teams, BMUs, and other groups	X	
Number of new PHE partnerships created that make linkages among organizations or institutions from different sectors	X	
Number of instances of organizations facilitating access to services outside of their traditional sectors/referrals to and from services within different sectors	X	



## NUMBER OF LINKED MESSAGES/MATERIALS CREATED

17 PARTNERSHIPS  
FOR THE GOALS



LEVEL OF MEASUREMENT: Process.

DEFINITION: Each new communication material (e.g., advertisement, video, educational book) counts as a “created” message. Materials that demonstrate and educate about the linkages among population, health, and environment are considered linked messages.

CALCULATION: None.

DISAGGREGATION: None.

PURPOSE: PHE programs often create messages to communicate the linkages among population, health, and environment. This indicator captures the creation of those messages that are cross-sectoral and communicate the interdependence of human health and the natural environment.

DATA SOURCES: Project records.

TIME FRAME: Quarterly.

DATA COLLECTION CONSIDERATIONS: Determining whether the message is linked could be subjective. The central criterium should be that the message examines a linkage between better human health and environmental quality.

STRENGTHS & LIMITATIONS: The creation of linked messages is simple and straightforward to collect. However, this indicator does not give information about whether the linked messages were adopted or disseminated, or where they appeared. The indicator does not show whether the messages were clear and of high quality, or whether they reached the target audiences.

## NUMBER OF MODEL HOUSEHOLDS IN PROJECT AREAS

LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This indicator measures the total number of model households in project areas during a specified period. Model households refer to households that, because of project interventions, engage in desired behaviors relative to the PHE program. While “model” households may be different within different communities they can include households that have improved water/drinking sources, have improved toilet facilities, practice water conservation, practice sustainable agriculture or other desired agricultural practices, are engaged in one or more alternative livelihoods activities, have healthy children who are fully immunized, use and are informed about modern family planning methods, use fuel-efficient cook stoves, and are knowledgeable about PHE activities among many other possible model behaviors.

CALCULATION: None.

DISAGGREGATION: Sex and age of household head.

PURPOSE: Model households can be used as positive peer deviants and mentors to other households and community members. By practicing and being available for visitors, these households can educate and illustrate these model behaviors while demonstrating the positive outcomes on their households and family members.

DATA SOURCES: Project records, secondary records.

TIME FRAME: Quarterly, annually.

DATA COLLECTION CONSIDERATIONS: Households can become model households by completing or engaging in several of the model behaviors for the PHE program. A household will need to be visited on a semi-annual basis to check the status of the household. The exact parameters for a PHE program’s model households must be agreed upon beforehand, and a basic checklist can be used to assess the household.

STRENGTHS & LIMITATIONS: Project staff and data collecting staff may differ in their understanding of the qualifications of a model household, so it is necessary to agree upon these parameters in the beginning of the project. Additionally, various factors can change a household’s model status, so frequent assessments may be necessary.



## NUMBER OF INSTANCES OF POPULATION, HEALTH, OR ENVIRONMENT ORGANIZATIONS ADDRESSING NONTRADITIONAL AUDIENCES



LEVEL OF MEASUREMENT: Process.

DEFINITION: This includes meetings, publications, coalitions, conferences, and brochures. Instances should be listed and described according to which PHE sector addressed a different sector or sectors, and on what topics (i.e., sector-specific, integration). Nontraditional audience means an audience that is in another sector from the one in which the addressee typically works.

CALCULATION: None.

DISAGGREGATION: None.

PURPOSE: Measuring this indicator will capture the instances where sectors attempt to communicate outside of their traditional audiences. The cross-sectoral education effort is important to building links between health and environment practitioners.

DATA SOURCES: Project records, secondary records.

TIME FRAME: Semi-annually, annually.

DATA COLLECTION CONSIDERATIONS: Using clearly defined terms in advance can reduce bias in collecting this indicator. When those addressing the audience work in a multi-sectoral setting or when the audience is multi-sectoral, this indicator may not give substantial information. Its goal is to collect information about audiences being addressed by organizations that have not traditionally worked in a multi-sectoral setting.

STRENGTHS & LIMITATIONS: This is only a measure of the number of instances that the program or project addresses nontraditional audiences; it does not indicate topics covered. This indicator can be collected if project records have a systematic form of recording the instances in which the program or project is involved.

## NUMBER AND FREQUENCY OF PHE EDUCATIONAL SESSIONS PROVIDED IN THE TARGET COMMUNITY

17 PARTNERSHIPS FOR THE GOALS



LEVEL OF MEASUREMENT: Input.

DEFINITION: This is a count of the educational sessions provided by a project on specific PHE issues that the project chooses in advance. Educational sessions counted here should be on topics related to integration of PHE rather than educational sessions provided on specific and single-sector topics. These sessions could occur in any context, including presentations to local officials, a community theater presentation, or a more traditional setting such as a group that regularly meets or a part of a community educator's typical work schedule. The critical part of this measurement is that the session is on PHE or linkages, as this indicator does not measure single-sector presentations or educational sessions. The project should define in advance which PHE issues will be addressed in the community and measure educational sessions on the predetermined topics central to the project's goals.

CALCULATION: None.

DISAGGREGATION: By target area (if desired).

PURPOSE: This captures the extent to which the project is educating the target population on the links between humans and the environment. While measuring knowledge or behavior provides outcome information, measuring the number of sessions provided measures the progress made by the project in educating the community.

DATA SOURCES: Project records.

TIME FRAME: Monthly, quarterly.

DATA COLLECTION CONSIDERATIONS: The methods of the educational sessions counted in this indicator may differ. Sessions may include community visits, outreach home visits, educational talks, educational or communication programs with integrated approaches, and video presentations.

STRENGTHS & LIMITATIONS: This indicator is easy to collect with good project record keeping. However, it does not give an indication of whether the target audience received the message or of their understanding and acceptance of the linked message.

## NUMBER OF NEW PHE PARTNERSHIPS CREATED THAT MAKE LINKAGES AMONG ORGANIZATIONS OR INSTITUTIONS FROM DIFFERENT SECTORS

17 PARTNERSHIPS  
FOR THE GOALS



LEVEL OF MEASUREMENT: Process.

DEFINITION: New partnerships are groups of organizations, either public or private, that have banded together to advance PHE policies or practices. The partnership is usually formed around the implementation of joint activities related to integration, either through service provision in a community of environment- and health-related needs or through expanding knowledge of the links among population, health, and the environment. “Different sectors” means that at least two organizations represented in the partnership are from different technical sectors (i.e., population, health, or environment). This instance should be counted toward the formation of the partnership rather than individual instances of collaboration. Therefore, this indicator is only counted once for each partnership. The terms of the partnership should be defined carefully before this indicator can be useful. A partnership is a formal arrangement between organizations, whether governmental or nongovernmental, and should include a charter, mission, memorandum of understanding, and clear guidelines as to how the partners will work together to achieve the goals of the partnership.

CALCULATION: None.

DISAGGREGATION: None.

PURPOSE: Creating new partnerships is what drives new and innovative linkages and programs. The investment in creating the terms and conditions of a partnership is often long. A formal partnership is generally necessary for the implementation of integrated activities, except in cases in which the organization is formed with an integrated mission. This indicator is meant to capture those partnerships among organizations from different and singular technical sectors that are formed with the purpose of discussing or implementing PHE.

DATA SOURCES: Secondary records.

TIME FRAME: Annually.

DATA COLLECTION CONSIDERATIONS: Care should be taken in deciding whether a group of organizations has reached the level of creating a partnership. This measure should only count toward formal partnerships that have written charters and missions. Many organizations may collaborate on certain issues or topics but may not have formed a formal partnership.

STRENGTHS & LIMITATIONS: This does not measure the level of success of the partnership or how long the partnership lasts. It does give an easy measurement of whether new and formal partnerships are made among varying sectors for the purpose of integrated work.

## NUMBER OF INSTANCES OF ORGANIZATIONS FACILITATING ACCESS TO SERVICES OUTSIDE OF THEIR TRADITIONAL SECTORS

17 PARTNERSHIPS  
FOR THE GOALS



LEVEL OF MEASUREMENT: Output.

DEFINITION: This indicator is targeting PHE project implementation models in which an organization that traditionally works in one sector (i.e., population, health, or environment) is either working with an organization of a different sector or directly implementing services traditionally provided by a different sector. When one organization facilitates access to a service outside of its traditional sector, it is accepting or promoting an integrated approach to responding to community needs.

CALCULATION: None.

DISAGGREGATION: None.

PURPOSE: The provision of health services is a new technical area for most employees of conservation organizations, and working with conservation organizations to provide health services is new to public health organizations. This indicator aims to capture instances in which organizations implement a specific activity or group of activities outside their traditional sectors.

DATA SOURCES: Project records, secondary records.

TIME FRAME: Annually.

DATA COLLECTION CONSIDERATIONS: Some organizations already provide services across sectors as part of their mission or established programs. The goal of this indicator is to capture those organizations that make new or increased efforts to facilitate access to other-sector services to communities outside of the organizations' longstanding tradition. This instance may be a single event or may be described once but include multiple activities or events in the context of a larger effort.

STRENGTHS & LIMITATIONS: This indicator does not measure the quality of the facilitation of services, but it is an indication of the effort of organizations to participate in multi-sectoral or integrated projects.

## NUMBER OF POLICYMAKERS, MEDIA, AND SCHOLARS KNOWLEDGEABLE ABOUT OR AWARE OF A SPECIFIC PHE ISSUE

17 PARTNERSHIPS FOR THE GOALS



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This is a count of policymakers, media members, and scholars knowledgeable about or aware of a specific PHE issue. The issue should be chosen by the project in advance and at the beginning of project implementation for tracking over the life of the project. This issue should be specifically defined to avoid error in counting whether an influential person has knowledge or awareness. Choosing a broad and overarching topic (e.g., the connection between family planning and environment) is not useful in counting this indicator. Similarly, policymakers, media, and scholars should not already be involved with or active in the PHE issue selected by the project. They should normally be targeted and monitored by the project on the specific issue selected.

CALCULATION: None.

DISAGGREGATION: By issue.

PURPOSE: Persons of interest knowledgeable about the PHE issue is an indication that the program/project's messages reached those in power or those who are in a position of educating or having an impact on the public.

DATA SOURCES: Secondary sources, key informant interviews.

TIME FRAME: Semi-annually, annually.

DATA COLLECTION CONSIDERATIONS: The definition of knowledge or awareness can give rise to complications in collecting this indicator with accuracy, as knowledge and awareness are difficult to measure objectively without the ability to perform pre- and posttests for the persons of influence. Using key informant interviews in which policymakers, media members, and scholars are interviewed about their knowledge or awareness of a PHE issue can assist in confirming information for this indicator. When possible, using an interview as a baseline and then repeating the interview at a scheduled interval can provide information over time about increased knowledge or commitment to a specific PHE issue.

STRENGTHS & LIMITATIONS: This indicator does not give information on whether the policymakers, media, or scholars are supportive of the specific PHE issue. It also does not measure the influential person's level of knowledge or depth of awareness of the issue.

## PERCENTAGE OF HOUSEHOLDS KNOWLEDGEABLE ABOUT OR AWARE OF A SPECIFIC PHE ISSUE

17 PARTNERSHIPS  
FOR THE GOALS



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: This is a percentage of the households in the project's target area whose residents are knowledgeable about or aware of a specific PHE issue. The issue should be chosen by the project at the beginning of project implementation for tracking over the life of the project. This issue should be specifically defined to avoid error in counting whether the person responding for the household has knowledge or awareness. Choosing a broad and overarching topic (e.g., the connection between family planning and environment) is not useful in counting this indicator. The households included should normally be those that are targeted and monitored by the project on the specific issue selected for this indicator, to be useful in determining whether the household gained the knowledge as a result of the PHE project.

CALCULATION:

$$\frac{\text{\# of households surveyed that are knowledgeable about a specific PHE issue}}{\text{Total \# of households surveyed}} \times 100$$

DISAGGREGATION: By PHE issue covered in survey.

PURPOSE: Household knowledge of a specific PHE issue may be an indication of the project's success in communicating the PHE issue or in increasing awareness of the community about the integration between human health and the natural environment.

DATA SOURCES: Population-based surveys.

TIME FRAME: Every two to five years.

DATA COLLECTION CONSIDERATIONS: The specific PHE issues should be determined in advance, remain consistent, and be monitored over time. When collecting information at the household level in a population-based survey, special attention should be made not to bias results by suggesting answers.

STRENGTHS & LIMITATIONS: This indicator only measures knowledge and does not indicate behavior change or where the knowledge was acquired. The questions utilized to measure knowledge must be carefully worded and pretested to ensure accurate measurement.



## NUMBER OF ENABLING LOCAL ORDINANCES/POLICIES SUPPORTING PHE



LEVEL OF MEASUREMENT: Outcome.

DEFINITION: An enabling policy refers to a policy that promotes integrated municipal or regional plans linking human and ecosystem health. This could be on a variety of topics or technical areas involving forests or marine ecosystems and different issues that enhance the quality of human life. The exact definition of “enabling” will differ by region, according to local ecosystem and community needs. Achieving this is a strong indication that elements in local, regional, or national government are supportive of PHE integration.

CALCULATION: None.

DISAGGREGATION: By country (if desired).

PURPOSE: Some PHE programs work toward changing policy to improve the implementation of PHE projects. The adoption of ordinances and policies supporting PHE sometimes involves allocating budgets from public sources for integration of services and activities.

DATA SOURCES: Secondary records (laws).

TIME FRAME: Annually, or every two to three years.

DATA COLLECTION CONSIDERATIONS: Permission may be needed to research and track laws of another country or a local setting. Strictly adhering to a predetermined definition of an enabling ordinance or policy is important for consistency in collecting this indicator. Ordinances and policies generally take significant effort and time investment and may take years to achieve. If the ordinance also requires a budget allocation, projects could track the amount of funding appropriately connected with the PHE ordinance or policy.

STRENGTHS & LIMITATIONS: While this indicator gives information on increased willingness of officials to codify integration, it does not indicate whether a budget was allotted for activities or service provision or whether any other action was taken in the community. However, most legislative processes involve long review and public debate and should be a good indication of the governmental commitment to integrating the locality/country approach to development.

## NUMBER OF PLACEMENTS OF LINKED PHE MESSAGES IN PRINT AND ELECTRONIC MEDIA BY INDEPENDENT SOURCES

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LEVEL OF MEASUREMENT: Output.

DEFINITION: Placements by independent sources include those messages on linked topics (not single- sector topics related to specific projects) that are written by parties not associated or affiliated with the project. Print and electronic media include magazines, newspapers, radio, and websites. Each article is counted as one placement, even if it was placed in multiple media sources.

CALCULATION: None.

DISAGGREGATION: None.

PURPOSE: When a third party publishes information or takes an interest through placing messages about integration in a public setting, it indicates that the PHE project has reached an audience.

DATA SOURCES: Secondary sources.

TIME FRAME: Semi-annually, annually.

DATA COLLECTION CONSIDERATIONS: Tracking messages placed by independent sources may be difficult and time-consuming without a systematic approach to monitoring media sources. Identifying in advance the sources that will be followed may provide a more streamlined approach.

STRENGTHS & LIMITATIONS: While this will measure the independent source's knowledge and awareness of a specific PHE issue, it does not give information about where the independent source received or learned the knowledge, unless the source was quoted in the article. Also, the placement of a message does not consider whether the message was accurate or supportive of PHE.

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