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FOOD SECURITY INDICATORS AND FRAMEWORK FOR USE IN THE MONITORING AND EVALUATION OF FOOD AID PROGRAMS

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I. Introduction

The purpose of this handbook is to assist in the identification of food security indicators to be used in the monitoring and evaluation of U.S. P.L. 480 Title II food aid programs. Effectively integrating food security indicators into the monitoring and evaluation (M&E) systems of food-assisted programs will ensure more efficient management of these increasingly scarce development resources and improve their ultimate impact on the lives and well-being of program beneficiaries. Recognizing this fact, recent revisions to the USAID guidelines for Title II food aid requests will require Cooperating Sponsors to establish M&E systems and identify performance indicators which can be used to assess the impact of their programs on the food security of participants.¹

The specific objectives of this handbook are:

- to summarize U.S. Government policy on the development of information systems to support the management of Title II food aid programs and document their food security impacts,
- to present the USAID definition of food security and a conceptual framework to assist in a consistent understanding of food security

¹USAID, Draft Interim Guidelines for FY 1986 P.L. 480 Title II Development Project Proposals (February 1995).

concerns in Title II food aid program areas,

- to define the respective role and information needs of both program monitoring and impact evaluation activities,
- to outline a process of identifying food security indicators for both the monitoring and evaluation of Title II food aid programs;
- to compile a list of those food security indicators commonly used to measure food security across a range of food-assisted programs; and
- to provide concise definitions of those indicators in order to promote their consistent use.

The focus of this handbook is not necessarily on defining a set of generic food security indicators which are applicable to all food aid programs. Food security is a complex problem (see **Box 1** for a brief definition), with specific dimensions that can vary considerably in different contexts. Given that fact, the program strategies utilized by Cooperating Sponsors to improve food security also vary considerably.

Therefore, no single indicator could effectively capture these multiple dimensions to the problem, or support the information needs of different program approaches.

Box 1--What is food security?

USAID defines food security as follows:

When all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life.

Achieving food security requires that the aggregate **availability** of physical supplies of food is sufficient, that households have adequate **access** to those food supplies through their own production, through the market or through other sources, and that the **utilization** of those food supplies is appropriate to meet the specific dietary needs of individuals.

Food security indicators for food-supported maternal and child health programs, for example, might be quite different from those which are appropriate for food-for-work programs. Similarly, food security indicators that are appropriate in the humid tropics of Latin America may have little validity in the semi-arid areas of Sub-Saharan Africa. And, finally, indicators that are useful for on-going program monitoring purposes may not be appropriate in the context of an impact evaluation.

The intent of this handbook is to outline a systematic process by which indicators can be identified in a context-specific fashion, given the socioeconomic system in which the program operates, the planned program approach and the intended uses of the information in an M&E system. This approach to indicator identification begins in **Section II** by outlining a conceptual framework for understanding food security issues in a

particular socioeconomic context. Use of the framework should allow Cooperating Sponsors to better understand the food security needs of intended beneficiaries, as well as to define a focused set of objectives which are directly related to planned food security impacts (see **Box 2** for a definition of the term **impact**). The second step in this context-specific approach is to outline the specific needs of an information system designed to monitor and evaluate the actual food security impacts of those programs.

These needs will vary, not only by program type, but according to the availability of existing relevant data, as well as the capacity and management objectives of each Cooperating Sponsor.

Box 2--How is impact defined?

The term **impact** refers to the set of program results that occur at the beneficiary-level and that can be directly attributed to program activities, rather than external factors.

Impacts may be defined as intermediate improvements in the **capability** of program beneficiaries to influence their own lives, such as through improved access to resources, or improved knowledge attained through training programs.

More typically, impacts may also refer to final improvements in the economic and personal **well-being** of individuals who receive goods and services through the program.

Impacts are often confused with program **outputs**, which refer to the quality and quantity of goods and services delivered through program activities.

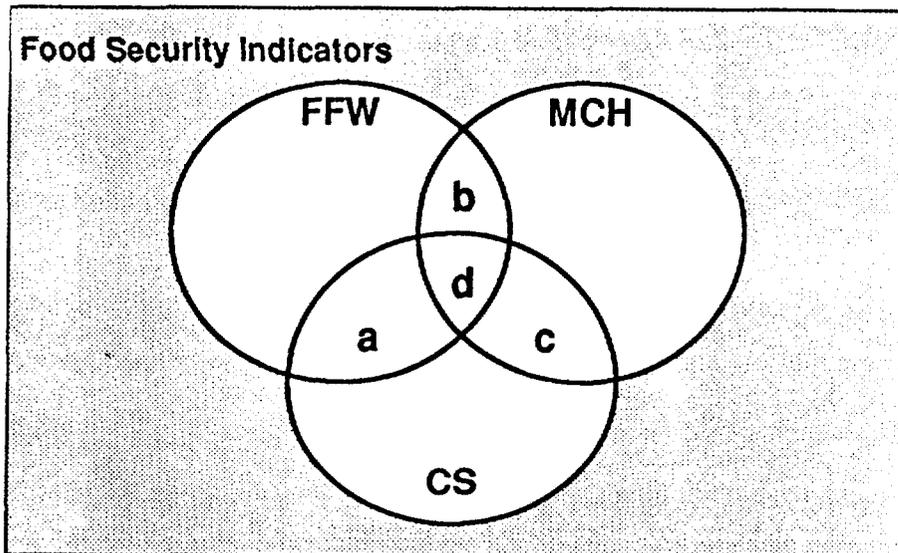
Section III presents a common set of concepts and terms, as well as approaches to designing M&E systems. **Box 3** presents a brief description of the differences in program monitoring and impact evaluation functions.

The final step is the definition of specific indicators to be collected and used, which is discussed in **Section IV**. Even though addressing a similar dimension of the food security problem, individual indicators may have vastly different requirements for data collection, measurement and interpretation. These must be understood in designing an M&E system. An indicator of child nutritional status, for example, may be defined in a variety of ways – according to the weight/age, height/age, weight/height or middle upper arm circumference (MUAC) measures, among others. Balancing the characteristics and data requirements of individual

indicators with the goals of the information system and the resources available to the Cooperating Sponsor is the fundamental problem in M&E design. Given the requirements of planning and the needs of decision-makers – both within USAID and the Cooperating

Sponsors themselves -- to compare the impacts of differing program strategies and determine priorities for investment, this effort will as much as possible identify indicators that are thought to be comparable across a range of programs and country contexts. Looking at **Diagram 1**, it is possible to envision a set of food security indicators which are appropriate for maternal and child health (MCH), child survival (CS), food-for-work (FFW) and other program types typically supported by Title II food aid resources. Clearly, some overlap may occur in the usefulness of these indicators across program types (intersections **a** through **c** in the diagram). It is less likely to identify an indicator which is relevant across all program types (intersection **d** in the diagram). **Section V** presents an inventory of food security indicators which are thought to have multiple applications in the monitoring

Diagram 1--Overlap of Food Security Indicators by Program Type



FFW -- Food for Work Programs
MCH -- Maternal and Child Health Programs
CS -- Child Survival Programs

Box 3--What is the difference between program monitoring and impact evaluation?

Program monitoring focuses primarily on the achievement of intended program-level outputs, such as the quantity of food delivered to a distribution center, or the number of people actually receiving rations. Monitoring involves the routine collection of information on an on-going basis to support basic management and accountability functions.

Impact evaluations, on the other hand, are designed to gauge the extent to which a program causes changes in food security conditions, such as improvements in nutritional status, at the beneficiary-level. Results from impact evaluations are critical to guide the management of current activities, to inform resource allocation decisions across program components and support the design or re-design of future interventions to maximize their potential impacts.

Finally, effective monitoring of program outputs is a critical aspect of evaluating programs. Without knowing who received what quantity and quality of goods and services at what cost, it is difficult to interpret the results of impact evaluations.

and evaluation of Title II food aid programs.

The requirement to identify food security indicators for Title II programs necessarily focuses program design on their intended impacts. This is an important step forward where, as is frequently the case, program objectives are defined only in terms of the delivery of certain goods and services, rather than their ultimate benefit to the lives and well-being of participants.

However, the identification of indicators, in itself, is not sufficient to ensure that they will be used effectively to identify problems in program design and management and suggest changes to actually improve program impact. Ultimately, the usefulness of indicators and the rigor with which they can be interpreted will be determined by the

quality of the data collection methods used in obtaining those indicators and, particularly, by how well M&E systems are integrated into the overall decision-making structure of the program.

II. Food Aid and Food Security

Food aid is an important development resource, supporting programs with a wide range of development objectives (see Box 4). For example, investments in soil and water conservation efforts supported by food-for-work programs, have potential long-term implications for increased agricultural productivity and crop income, while school feeding programs are typically intended to improve student attendance and performance, factors which ultimately lead to enhanced labor productivity and higher wage earnings. Improved health and nutrition achieved through food-assisted maternal and child health programs or food-for-work efforts at improved water and sanitation have immediate implications for individual health and well-being and also promote productivity and income-earning potential over the long-term.

While the development objectives of food-assisted programs are potentially diverse, it is possible to trace most of those intended impacts to likely improvements in food security, impacts which often go well beyond the immediate distribution of food supplies to needy people. Sustainable increases in incomes, improved agricultural productivity, improvements in health and nutrition, and other potential benefits of food aid programs should ultimately lead to improvements in the **availability** of food supplies at the national or regional level, or in the **access** to food at the household level through higher home production of food crops, market

purchases and other means, or in the more effective **utilization** of food at the individual level to meet human biological needs.

USAID defines food security as follows:

When all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life.²

By this definition, food security is a broad and complex concept which is determined by the interaction of a range of agro-physical, socioeconomic and biological factors. Like the concepts of health or social welfare, there is no single, direct measure of food security. However, the complexity of the food security problem can be simplified by focusing on three distinct, but inter-related dimensions of the concept as mentioned above: **food availability**, **food access** and **food utilization**.

According to the USAID definition:

- **Food availability** is achieved when sufficient quantities of food are consistently available to all individuals within a country. Such food can be supplied through household production, other domestic output, commercial imports or food assistance.
- **Food access** is ensured when households and all individuals within them have adequate resources to obtain appropriate foods for a

²"Food Aid and Food Security: USAID Policy Paper," February 1995.

nutritious diet. Access depends on income available to the household, on the distribution of income within the household and on the price of food.

- **Food utilization** is the proper biological use of food, requiring a diet providing sufficient energy and essential nutrients, potable water and adequate sanitation. Effective food utilization depends in large measure on knowledge within the household of food storage and processing techniques, basic principles of nutrition and proper child care and illness management.

Achieving adequate food security is arguably a necessary first step toward the more general development objectives of improved human well-being, the alleviation of poverty and sustainable, broad-based economic growth. As the discussion of U.S. Government food aid and food security policy will indicate below, the design of food aid programs must increasingly make more explicit the linkages between planned activities and their likely impact on the food availability, access and utilization of intended beneficiaries. Beyond the planning stage, to warrant continued U.S. Government support for those activities, food aid programs must ultimately be able to directly demonstrate their food security impacts on those beneficiaries.

The Policy Context

The concern for the food security impacts of Title II food aid programs is based in U.S. Government policy. Enhancing the

food security of the poor in developing countries is the primary objective of U.S. food aid programs. According to the 1990 U.S. Agricultural Development and Trade Act:

It is the policy of the United States to use its agricultural productivity to promote the foreign policy of the United States by enhancing the food security of the developing world through the use of agricultural commodities and local currencies accruing under the Act to:

- combat world hunger and malnutrition and their causes;
- promote broad-based, equitable and sustainable development, including agricultural development;
- expand international trade;
- develop and expand exports for United States agricultural commodities; and
- foster and encourage the development of private enterprise and democratic participation in developing countries.

Similarly, the USAID policy paper entitled "Food Aid and Food Security" also stresses the use of food aid as an instrument to achieve food security. For Title II programs, the Agency gives particular priority to food aid programs in the most food insecure regions of Sub-Saharan Africa and South Asia, particularly to efforts which focus on:

- **improving household nutrition**, especially for children and mothers;
- **increasing agricultural productivity** to alleviate one of the leading causes of hunger; and

Box 4--Title II Food Aid Program Types

Food aid commodities or their monetized proceeds are used to support a variety of intervention types:

Humanitarian Feeding (HUM)

In these programs food or, in isolated cases, cash is distributed directly to disadvantaged groups, or those severely affected by emergency conditions.

Food-for-Work (FFW)

Food-for-work programs use food aid as payment for laborers in public works programs designed to build and maintain local infrastructure such as roads, dams, wells, latrines, schools, etc. Cash from monetization proceeds may also be used to purchase inputs or as cash wages in cash-for-work (CFW) programs.

Maternal and Child Health (MCH)

In MCH programs, food aid provides supplementary rations in programs seeking to improve the health and nutritional status of, typically, pregnant and lactating mothers and children under the age of five. Most MCH programs combine food aid with other elements such as nutrition and health education, growth monitoring and counseling, and immunization, which may, in part, be funded through monetization proceeds.

Child Survival (CS)

In CS programs, food aid is used for supplementary rations and, from monetization funds, other inputs in efforts targeted primarily to improving the health and nutrition of children, including child immunizations, control of diarrheal diseases and acute respiratory infections, and the promotion of breastfeeding.

School Feeding (SF)

School feeding programs provide students with snacks, lunches and/or breakfasts at schools as incentives to increase enrollment, maintain attendance and improve the performance of students.

Other Child Feeding (OCF)

OCF programs provide meals to particularly vulnerable groups of children outside the school setting.

Monetization (MON)

The sale of food aid through monetization programs provides financial resources for use in a variety of activities, including education and training, health and nutrition, agriculture, rural credit, micro-enterprise, cash-for-work and other development programs.

From World Food Day Report, The President's Report to the U.S. Congress, October 16, 1994

- **Increasing incomes** in rural and urban areas through economic and community development and by promoting sound environmental practices.³

Food Security Impacts. While U.S. food aid policy emphasizes food security objectives, a 1993 review by the U.S. General Accounting Office found that it was difficult to document the food security impacts of past food aid programs.⁴ According to the report, this is in part a result of a lack of operational guidance from the Agency to assist in the identification of food security objectives and evaluation methodologies for food aid programs.

As a result of that finding, and in keeping with its mandate to employ performance-based management methods, the Agency has shifted the oversight focus of food aid programs from an emphasis on commodity monitoring and accountability, to one which stresses the food security impacts of food aid programs on their intended beneficiaries. This new focus requires that performance monitoring and impact evaluation systems be introduced into Title II programs to permit USAID and Cooperating Sponsors to demonstrate more clearly their programs' food security impacts. Approval for programs will depend upon the success of field managers in demonstrating that food security impact.

³See "Food Aid and Food Security: USAID Policy Paper," February 1995, p. 2.

⁴U.S. General Accounting Office, Review of USAID Food Aid Programs, 1993

The details of this policy shift are enumerated in the USAID "Draft Interim Guidelines for FY 1996 P.L. 480 Title II Development Project Proposals" (February 1995):

In the current environment of limited food aid resources, there is a need to focus and streamline Title II development projects in order to demonstrate greater impact and to ensure that appropriate monitoring and evaluation systems are established to document the results of that impact.

Specific elements of the guidelines include the following requirements for the Development Project Proposals (DPPs)⁵:

- An external impact evaluation of the project must be planned for in the DPP and conducted no later than the first quarter of the final year of the project, with a final report submitted to USAID no later than the second quarter of the final year of the project;
- The DPP should describe the baseline data utilized and its source, state the indicators developed for monitoring project-level progress during implementation and discuss criteria for assessing impact;
- Criteria should be adequate to measure progress in annual reporting and evaluation and should include benchmarks for activity completion and indicators of project effectiveness; and
- The DPP should describe the information and data collection systems in place or

⁵Under the new draft guidelines, DPPs will replace the previously employed Multi-Year Operational Plans (MYOPs).

planned that will be used to monitor progress, including data reporting procedures and mechanisms to analyze the data to direct future programming.

According to the guidelines, USAID Missions are intended to be close partners in the planning, monitoring and evaluation of food-assisted projects. Missions will review each Title II project annually regarding budget, objectives and action plan, and other project elements. In particular, the DPPs of Cooperating Sponsors, including M&E objectives, benchmarks and indicators, will be subject to review and concurrence from USAID Missions.

Issues and Concerns. The emphasis on performance-based management and demonstrating the impacts of Title II food aid programs on program beneficiaries is an important step forward in USAID policy. The establishment of effective M&E systems will lead to better accountability, as well as improvements in program design and management. These efforts should ultimately strengthen the impact of these programs on the well-being of their intended beneficiaries.

While the guidelines provide clear direction on the role of M&E systems in food aid programs and Agency decision-making, they leave much to the discretion of program managers in terms of M&E system design. The diversity of both food aid program types and the structure of Cooperating Sponsor organizations requires some flexibility in the identification of indicators and the design of data collection systems and analytical plans. In the absence of

clearly identified "best practices" in M&E design for food aid programs in the early stages of this initiative, the M&E systems of Cooperating Sponsors are likely to evolve significantly over time with greater experience. An important issue for clarification between Cooperating Sponsors and country missions is the precise meaning of the requirement for an "external" evaluation, which may take a variety of forms, each with different implications for the design of an M&E system.

Program managers are also given some discretion in how best to balance the inherent trade-off between M&E system costs and the ultimate rigor of conclusions which various levels of investment in information systems can support. Evaluations which rely on existing secondary information, such as clinic-based growth monitoring data, to show improving trends in areas of program operation may be relatively inexpensive compared to intensive program-based data collection efforts.

At the same time, these inexpensive methods may not provide sufficient information to actually link those changes to program activities, as required to show beneficiary-level impact. Often more intensive M&E system efforts are required to show impact in a more rigorous fashion. The range of possible approaches to M&E system design underscores the need to establish an effective partnership between Cooperating Sponsors and USAID Missions to ensure that M&E systems meet the information requirements of both in the most cost-effective fashion.

The focus on managing for results and the use of indicators to measure performance has also raised concerns that Cooperating Sponsors may feel constrained to alter their programs to score well on specific indicators. Because food aid is a flexible resource which can serve a variety of development objectives, it may be successfully used in ways that do not directly address food security concerns in the short-term, or at least not in any measurable way within the 5-year time frame laid out in the USAID draft guidelines for program evaluations. Food-assisted education programs, for example, may have important long-term implications for labor productivity and incomes and, ultimately, the food security status of beneficiaries and their families that may not emerge within the life of the project.

Similarly, in the case of reforestation efforts, the time necessary for seedling stands to mature into sustainable economic assets or for resulting changes in crop rotations and soil quality to have an impact on crop yields suggests that the most important returns to these investments may be evident only after the life of the project. These concerns suggest that care must be taken by policy makers in the use of indicators to measure performance and impact. While the definition of performance indicators is important to more clearly focus the design of programs on their beneficiary-level impact, Cooperating Sponsors should not be pressured to focus only on programs which have more directly measurable short-term impacts, at the expense of those with perhaps more sustainable long-term impacts, for which

the ultimate returns to investment may be much greater.

Food Security Analytical Framework

The USAID Policy Paper entitled "Food Aid and Food Security" identifies a range of important issues which lead to the food insecurity of households and individuals in the developing world. These include, among others:

- chronic poverty,
- rapid population growth,
- declining per capita food output,
- poor infrastructure,
- ecological constraints,
- limited arable land,
- inappropriate policies,
- disease,
- poor water and sanitation,
- inadequate nutritional knowledge,
- civil war, and
- ethnic conflicts.

The actual impact of these factors on the food security status of households and individuals may be achieved through a variety of possible pathways. Rapid population growth, for example, may affect food security status through the impact of overcrowding on reduced per capita land availability and per capita food availability, or through its effects on environmental degradation and reduced agricultural productivity, or through its effects on sanitation and the spread of disease, which influences not only labor productivity and incomes, but also nutritional status. The relative importance of any one of these pathways as a determinant of food insecurity will

vary significantly across households, across locations and over time.

Clarifying these pathways is critical, not only for the design of interventions, but also for the identification and interpretation of food security indicators. The complexity of the food security problem in developing countries suggests the need to develop a framework which leads to a consistent analysis of the actual mechanisms which undermine the food security of specific population groups. A well-defined conceptual framework also provides a broader context which is critical for successfully interpreting food security indicators, particularly in the identification of factors (such as climate or food prices) which may be outside the influence of the program, but may mask the actual program impact on the food security status of intended beneficiaries. A well-defined conceptual framework supports the design of data collection systems and analytical plans which can control for these "confounding factors," distinguishing their influence from the impacts of the program itself.

Diagram 2 outlines the USAID food security framework, highlighting the three dimensions of availability, access and utilization, the nature of their relationship to one another, as well as a brief description of their determinants.

As indicated in Diagram 2, **food availability** is a function of the combination of domestic food stocks, commercial food imports, food aid, and domestic food production, as well as the underlying determinants of each of these factors. Use of the term availability is

often confusing, since it can refer to food supplies available at both the household level and at a more aggregate (regional or national) level. However, the term is applied most commonly in reference to food supplies at the regional or national level.

Food access is influenced by the aggregate availability of food through the latter's impact on supplies in the market and, therefore, on market prices. Again, Diagram 2 indicates that access is further determined by the ability of households to obtain food from their own production and stocks, from the market and from other sources. These factors are, in turn, determined by the resource endowment of the household which defines the set of productive activities they can pursue in meeting their income and food security objectives.

Food access also is a function of the physical environment, social environment and policy environment which determine how effectively households are able to utilize their resources to meet their food security objectives. Drastic changes in these conditions, such as during periods of drought or social conflict, may seriously disrupt production strategies and threaten the food access of affected households. To the extent that these shocks often lead to the loss of productive assets such as livestock, they also have severe implications for the future productive potential of households and, therefore, their long-term food security.

To cope with those shocks and minimize potential declines in food access, households typically adjust their

consumption patterns and reallocate their resources to activities which are more insulated from the influence of those risks. In drought periods, for example, households may shift their labor resources from crop production to non-farm wage employment or sell-off small assets to ensure continued income. They may also adjust their consumption patterns, reducing their dietary intake to conserve food and relying more on loans or transfers and less on current crop production and market purchases to meet their immediate food needs. Over time, as a crisis deepens, household responses become increasingly costly, leading to the loss of productive assets which can ultimately undermine future livelihoods and, again, their long-term food security status.

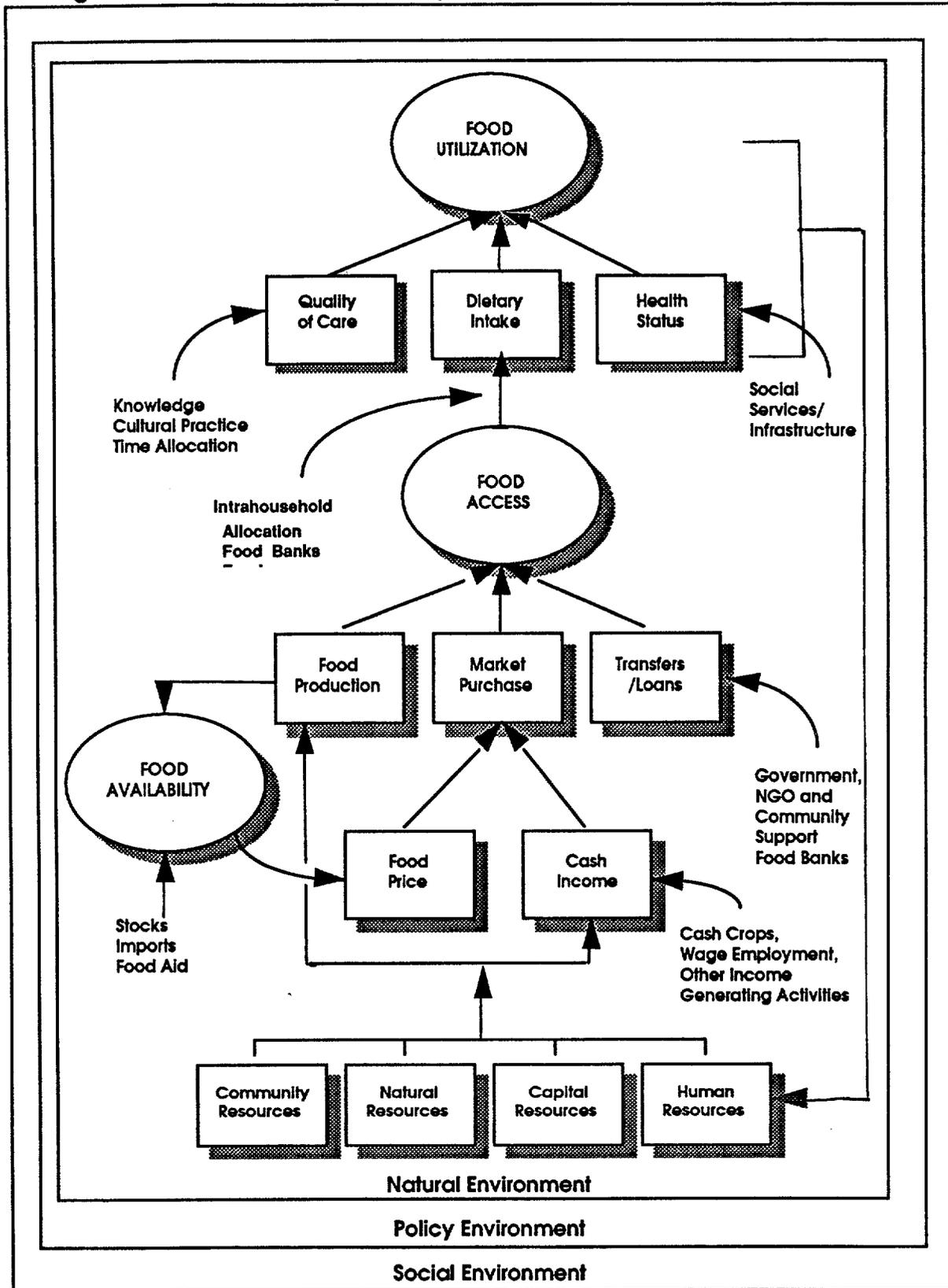
Food utilization, which is typically reflected in the nutritional status of an individual, is determined by the quantity and quality of dietary intake, general child care and feeding practices, along with health status and its determinants. Poor infant care and feeding practices, inadequate access to, or the poor quality of, health services are also major determinants of poor health and nutrition. While important for its own sake as it directly influences human well-being, improved food utilization also has feedback effects, through its impact on the health and nutrition of a household members and, therefore, on labor productivity and household income-earning potential.

Understanding the Causes of Food Insecurity. In any given context, food security concerns may be due to either

inadequate physical availability of food supplies, poor access among a specific segment of the population, or inadequate utilization. The conceptual framework in Diagram 2 suggests a hierarchy of causal factors which ultimately influence the various dimensions of food insecurity: adequate food availability at the aggregate level is a necessary, although not sufficient, condition to achieve adequate food access at the household level, which, in turn, is necessary but not sufficient for adequate food utilization at the individual level.

In designing a program to address a particular dimension of food insecurity, it is necessary to work backwards from the immediate manifestations of food insecurity to the root causes of the problem. For example, it is important to know whether weaning diets are poor because household access is poor or because the knowledge and feeding norms of the targeted population are inadequate. Similarly, if access is thought to be the overriding constraint to proper weaning practices, the determinants of poor access – such as inadequate incomes or low per capita crop production due to small land holdings and poor soil quality, for example – must be understood and addressed as well.

Diagram 1. Food Security Conceptual Framework



Understanding the causes of food insecurity necessarily requires a significant amount of information-gathering at both the national level and within the selected program area. Normally, quantitative information will be available to begin this analysis from data collected routinely by the host government Agriculture, Health or Planning Ministries, national survey data sets such as those developed under the USAID-sponsored Demographic and Health Surveys (DHS) Project, as well as information in existing studies and reports. In addition, it is also typically necessary to conduct field studies using, at a minimum, qualitative techniques to develop a refined understanding of local conditions in the intended program area, or even quantitative assessments using survey methods

Key Questions. In most cases, a series of simple and related questions can provide a very general structure to guide that information-gathering process. While the questions themselves are simple, obtaining their answers may be quite complex, requiring expertise from a variety of relevant technical disciplines:

- ***Where do households get their food?***

To obtain their food, households typically either: (a) grow it and consume from their own stocks; (b) purchase it in the marketplace; (c) receive it as a transfer from relatives, members of the community, the government or foreign donors; or (d) gather it in the wild (see again Diagram 2). Understanding these

basic patterns and how they vary across locations, population groups and over time will provide a particularly important starting point for understanding the general nature of the food security problem. For example, to the extent households rely on market purchases as an important source of food, cash incomes (or expenditure levels) are likely to be a more or less important indicator of their food security status. Similarly, livestock are likely to be more important as a food source for pastoralist groups than for farmers, so that indicators of livestock conditions become more important signals of food security status for the former socioeconomic group than for the latter.

- ***What are the factors that limit the ability of households to obtain food from each of these sources?***

As already noted, the USAID Policy Paper identifies a large number of possible causes of food insecurity. However, the factors that limit the ability of households to grow, store, purchase, gather or receive transfers of food will, again, vary by location, across socioeconomic groups and over time. Once the basic sources of food have been identified, it is necessary to investigate the often complex interaction of agro-physical and socioeconomic processes that limit a household's ability to obtain sufficient quantities of food from each source.

In the Horn of Africa, for example, a leading determinant of food insecurity is

low levels of per capita food production. The primary constraints to improved food production in the region are a combination of low and erratic rainfall, high population densities, deforestation and, as a result, an accelerated deterioration in soil quality and crop yields. Poor market infrastructure and an unfavorable policy environment which leads to high and variable prices for inputs and low producer prices further undermine productivity in many countries in the region. By identifying the specific nature of those constraints and establishing priorities, program managers can determine whether soil and water conservation, market infrastructure development or other measures are required to address local food production problems.

Research indicates that many of the food insecure in developing countries, even among so-called subsistence farming groups, are net purchasers of food. The importance of market purchases for most food insecure households and the degree of risk typically faced in household income and consumption strategies, particularly in Sub-Saharan Africa and South Asia, suggest another set of questions:

- ***How do households obtain their cash income, and what are the factors that limit the ability of households to obtain income from each of these sources?***

The cash incomes of households are influenced by their access to basic resources (such as land, draft power, farm implements and family labor), the quality of those resources, their access

to markets for productive inputs, as well as markets for their labor and produce. Where incomes are especially vulnerable to short-term fluctuations from drought and other factors, an important determinant of the level and stability of incomes is the relative exposure to those risk factors. Risk exposure is determined, in part, by the ability of households to diversify their sources of income geographically through trade and migration and into other non-farm activities. The identification of household income sources and the factors which influence their relative importance and stability are important steps in understanding the ability of households to obtain sufficient supplies of food.

Again in terms of Diagram 2, in addition to moving backward from individual sources of food and income to an understanding of the factors which ultimately determine the level and stability of food access, the analysis of food security also requires moving forward from an understanding of access to answer the question:

- ***What are the factors that limit how well households use their food to meet the dietary needs of the individuals within them?***

Dietary needs are primarily a function of age, gender, reproductive status, size and activity levels. Typically, infants and pregnant or lactating women have the highest overall needs, relative to their size, for calories, protein, vitamins and minerals. Rural populations engaged in heavy agricultural labor may require more calories, on average, than urban-based populations. Meeting the

nutritional requirements of individuals also requires appropriate dietary practices, which are strongly influenced by nutritional knowledge and cultural biases, as well as by the competing demands for the time of the household's main caretaker in the preparation of quality meals.

The incidence, duration and severity of disease also influences food utilization. Health status influences how much food is consumed by individuals, such as in the case of TB patients who often experience a loss in appetite. Health status often influences how effectively food is used to meet biological needs, given the diarrhea, vomiting and metabolic imbalances that are associated with many common diseases.

Also, to effectively fight diseases, individuals often require greater quantities of food. Constraints to improved health status and, therefore, effective utilization typically include poor quality water and sanitation as well as poor access to health services.

Finally, because food security status often varies significantly by population group, programs are often targeted to specific segments of a region or a community. Therefore, to obtain a full understanding of food security conditions in a given region, it is also often necessary to answer the question:

- ***Who are the most food insecure or vulnerable population groups?***

Vulnerability is strongly related to the concept of food insecurity, highlighting the element of risk that households face in their production, income and

consumption activities. Vulnerability can be defined as the likelihood that a specific population group will experience an acute decline in their food access. In addition to the risks that households face, vulnerability further implies that these groups are unable to sufficiently cope with those threats to effectively protect their basic food access.

Typically, under general conditions of poverty, poor food access and poor utilization, the special developmental and dietary needs of young children (especially those under 5 years of age) and pregnant and lactating women place these groups among the most food insecure and vulnerable. Female-headed households, the elderly, the disabled and other disadvantaged groups with low levels of household labor and insufficient means of support from family members and the community are also typically included as being among the most food insecure and vulnerable as well.

Other households are vulnerable because they live in areas susceptible to natural or man-made disasters. Households under the extreme threat of conflict, drought and other risks, particularly those households lacking a diversified income and asset base to cope with those risks, are also considered among the most food insecure and vulnerable groups.

Identification of vulnerable groups is important not only in the design and targeting of interventions, but again in the assessment of program impact which may need to be disaggregated to determine the effect of program activities

on specifically targeted population groups. The concern for the impact of agricultural programs on women's income, for example, which is thought to have important implications for the food access of their children, is one manifestation of the need to understand impact on specific subsets of the population.

Identifying Food Security Program Objectives

With a systematic understanding of food security conditions and constraints in a given program area, program managers can begin to develop a set of program goals and objectives to address what are determined to be among the most significant constraints, or those where the probability of a successful intervention is highest. Ultimately, impact evaluations are intended to assess how well the program has met its stated food security-related goals and objectives. Therefore, a clear (and measurable) set of goals and objectives is the first step towards developing performance indicators and establishing an effective M&E system. **Box 5** provides an example of a PVO effort to link its program goals and objectives to an explicit assessment of local food security conditions in Central America.

Box 5--Linking Food Security Analysis to Program Design

One international PVO has used a variety of analytical methods, all based on a well-formulated food security conceptual framework, to re-formulate its program in a Central American country. In 1994, the PVO and its counterparts used an analysis of available national-level data to identify areas of greatest need as a means to better target its activities. Subsequently, the PVO undertook a rapid food security assessment in selected program areas to develop a set of goals, objectives and interventions for its revised Title II food aid program.

At the national level, the assessment found that food insecurity in Honduras is characterized by low per capita incomes, declining food production per capita and a heavy dependence on food aid to meet availability requirements. In the PVO program area, small farm size, widespread deforestation, inadequate conservation and storage, and soil erosion lead to low and variable levels of food production on a year-to-year basis. Food consumption is also low and variable, and heavily reliant on a small number of staple crops. As a result, and given a high prevalence of acute respiratory infection and diarrheal disease, child malnutrition are also quite high. Access to health services is limited. To meet shortfalls in own production, households typically rely on wage employment, working for wages on local farms or migrating to work on farms in other parts of the country. Other income options are reported to be limited.

Given the results of the assessment, the PVO has established the following program goals:

- (1) To increase the **availability** of basic foods, with specific objectives to:
 - increase food production and diversity,
 - improve the storage and conservation of food, and
 - improve the marketing and acquisition of food and inputs for agricultural production.
- (2) To increase **access** to food, with specific objectives to:
 - increase/secure the resilience of household income,
 - improve the stability of local food prices, and
 - improve the provisioning of food to vulnerable groups, when and where needed.
- (3) To improve the **biological utilization** of food, with specific objectives to:
 - improve maternal child care and reproductive services, and
 - improve the availability, quality and access of health services, water and sanitation.
- (4) To improve the **institutional capacity** to manage national and local development interventions and resources devoted to the improvement of food security.

While the PVO is currently involved in a variety of activities, including school feeding, food-for-work and small economic activity development, it hopes to use its understanding of food security conditions to re-vamp its program, identifying a package of interventions which are most appropriate to the food security context of the communities in which it operates.

III. Information Requirements for M&E Systems

Access to information on food security conditions in general and program performance and impact in particular is critical to effective program design and management, providing the capacity to:

- understand problems at the program and population levels,
- define solutions to program-specific or population-specific problems, and
- influence decision-making among donors, program staff and participants to effect positive change in program implementation and, ultimately, to improve program impact.

The specific information requirements in any M&E system depends on the decision-making needs of the various individuals who have a stake in the program's outcome (see **Table 1**). Field staff typically require continuous information on stocks, demand for services and trends in beneficiary-level conditions to plan and make necessary adjustments to their activities. Program managers require information for basic supervision and accountability requirements, program planning and design, as well as internal resource allocation decisions. In most programs, evocative and easily understandable information is required for advocacy and policy purposes, as leverage to effect

important changes in government or donor policies, or to lobby for expanded program funding.

Host governments and donors also require information to inform their own strategic planning and resource allocation decisions. Often forgotten as program stakeholders are the program beneficiaries themselves. In a program which emphasizes participatory methods, information on individual child health or nutritional status, as well as on conditions within the community at large, is often important as a first step in defining participant-based solutions and in taking the necessary actions at the household-level to address those problems.

In addition to monitoring and evaluation, there are a number of possible uses of food security-related information to support a variety of decision-making needs for program managers, including: including general assessments of food security and vulnerability conditions, needs assessments for particular interventions, the targeting of specific population groups or regions for participation in those interventions, the regular monitoring of food security conditions for early warning purposes, in addition to program monitoring and impact evaluation (see **Box 6**).

There is typically a high degree of overlap in the basic indicator types required to meet these various decision-making needs, with differences related primarily to a specific analytical focus or data collection method employed. Anthropometric data from growth

Box 6--Uses of Food Security-Related Information

In addition to program monitoring and impact evaluation, there are a number of other possible uses of food security-related information and indicators, including:

Food security or vulnerability assessments, which provide a basic understanding of the determinants of food insecurity and vulnerability by location and population group. Vulnerability assessments differ from the more general food security assessments only in their greater emphasis on the risks that households face in their production, income and consumption activities, as well as the threat of rapid and acute declines in food security status. When conducted on a location-specific basis, vulnerability assessments often lead to one or a series of maps which characterize the regional dimensions of risk and coping capacity.

Needs assessments link the understanding of food insecurity and vulnerability in a program area to the design of relief and development interventions. These assessments, while conceptually separable, are often made in conjunction with food security and vulnerability assessments.

Targeting systems are used to guide the delivery of commodities and program services to the most food insecure or vulnerable population groups. These systems also rely on the understanding of food insecurity derived from food security and vulnerability assessments for the identification of targeting criteria. Targeting systems may be used to identify individuals, households, communities or regions for participation in both relief and development interventions.

Early warning monitoring entails the periodic assessment of factors influencing food availability, access and utilization for population groups which are particularly vulnerable to the risk of drought, conflict and other factors that may lead to rapid and acute declines in food security status. Early warning systems predict future changes in food security status and alert for the need to adjust on-going interventions or initiate new interventions to meet emerging food security threats.

monitoring activities, for example, may be quite useful in a program monitoring context to identify the need for supplementary rations in individual cases of undernutrition or growth faltering and, perhaps, to show basic overall trends in food security conditions. However, given the limited geographic coverage of clinic-based growth monitoring, rapid

anthropometric surveys are often also necessary to target more general feeding programs in an emergency context. Similarly, while both food security assessments and relief targeting systems might use measures of per capita crop production as an important indicator of food security status, the former analysis may be more concerned with long-term averages in production, while the latter may focus primarily on production data related to the most recent harvest.

The remainder of this handbook will focus primarily on food security indicators in the context of program monitoring and impact evaluation. Again, while many of the indicators used in M&E systems are similar to those required for the various information uses described above,

differences in analytical focus and methodologies may suggest different data collection and analytical approaches.

Table 1--Information Needs, Dissemination, and Use

Audience	Role Role in evaluation and follow-up.	Which/Why Which results they need to get and why.	How How they can get the results.
Program beneficiaries	Planning, carrying out evaluation	Full results - to put recommendations into action	Participation, meetings, study of results, Mass media.
Program staff	Coordination, facilitation of decision-making and action	Full results - to put recommendations into action	Participation, meetings, study of report.
District-level agencies	Receive info. disseminate lessons, support action	Full results - or summary for lessons learned and decision-making	Full report, discussions w/ evaluators, mass media.
Regional-level agencies	Receive info. disseminate lessons, support action	Full results - or summary for lessons learned and decision-making	Summary, discussions, meetings.
National-level agencies	Receive info. disseminate, support action	Full results - or summary for lessons and	Summary, discussions, meetings.
External funding agencies	Receive info. disseminate, support action	Full results - or summary for lessons and	Full report plus summary discussions
International-level agencies	Receive info. disseminate, support action	Full results - or summary for lessons and	Summary, discussions, meetings.

Source: UNICEF (1991), A UNICEF Guide for Monitoring and Evaluation, New

M&E System Framework

Monitoring and evaluation (M&E) systems are key instruments for strategic and operational management of food-assisted programs. M&E systems permit Cooperating Sponsors to track the flow of program resources and to assess the impact of programs on the food security of beneficiary populations.

For the sake of organizing indicators in any M&E system, it is often useful to begin by organizing the programs themselves according to their component parts. In particular, it is important to clarify the distinction between program inputs and outputs, and between program inputs and impacts, in order to effectively identify impact indicators. As outlined in **Diagram 3**, the following represents a fairly standard and useful breakdown for understanding the various elements of food aid programs:

Program inputs refer to the set of resources that are the raw materials used in the program. These include the human and financial resources, physical facilities, equipment and operational policies that enable program services to be delivered. In the case of agro-forestry activities supported by a food-for-work program, for example, inputs might consist of extension staff, seedlings, equipment for digging wells and irrigation structures community labor employed on the activity, as well as food commodities used as payment for tree-planting. In an MCH program, the inputs might include health staff and facilities, drugs and equipment, as well as food used for the

supplementary feeding of pregnant and lactating women and undernourished or faltering children. The monitoring of inputs, such as recording port arrivals of food and supplies, maintaining payroll records and other administrative reports are typical functions already undertaken by most good monitoring systems concerned with basic management and accountability.

Program processes refer to the set of activities, or functional areas, through which program inputs are used to obtain the expected results of the program. These processes can be broken down according to specific functional areas which are fairly generic in their application across program types, including management and supervision of various components of the program, counterpart training, logistics and service delivery, as well as information systems. The monitoring of these activities is typically in terms of their relevant outputs, as defined below.

Program outputs refer to the results of program activities at the program-level, regarding the quality and quantity of goods and services delivered under the program. This basic focus on program outputs is typically the level at which M&E systems have operated in the past in the context of food-assisted programs.

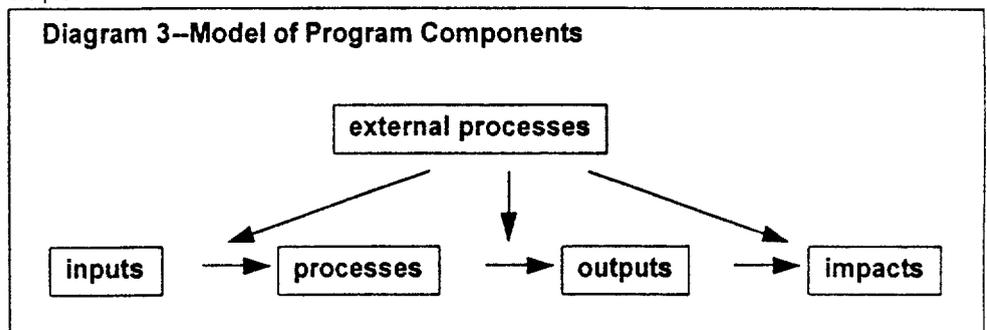
Program outputs may refer to:

- specific functional area activities, such as the number of supervisory visits completed, the number of health or extension staff trained, or

- the quantity of food delivered to a warehouse
- service outputs, related to the access to and quality of the services provided, such as ability to increase the number of program locations, the average distance to service delivery points, assessments of the knowledge and practice of service providers and other measures of service quality, and
- the degree of service utilization by program beneficiaries, including the number of people fed, percentage of eligible children measured, or households adopting a recommended agricultural technology package.

External processes are events external to the program that affect the relationship between outputs and impacts. For example, in MCH programs, nutritional improvements might not be observed during the life of the program because of climatic instability, rising food prices or other factors beyond the control of the program. Similarly, in the case of efforts to improve agricultural production, the level of rainfall and prices of some agricultural inputs may also be beyond the control of the program, but have major implications for program performance. By measuring and controlling for these confounding factors, evaluations may still conclude that beneficiaries would have been worse off in the absence of program efforts, thereby demonstrating a positive impact.

Program impacts refer to the set of results, such as changes in access to and quality of resources, changes in behavior, or improvements in well-being that occur at the beneficiary level and that can be directly attributed to program activities and outputs. While basic food security conditions may improve over the life of the intervention, perhaps as a result of external processes as described above, it is the attribution of some element of those changes to program activities that constitutes the basis of the term impact in an M&E context.



Program impacts can be further broken down to distinguish:

- **Impacts on capability** which refer to intermediate-level program outcomes such as improvements in the access to, or quality of, resources, and improvements in the knowledge and practices of beneficiaries. These intermediate impacts provide beneficiaries with the necessary tools to bring about sustainable improvements in their own food security status and general well-being. Increases in irrigated area resulting from food-for-work programs, improved access to working capital as part of micro-

enterprise development activities, as well as the improved knowledge and behavior which can result from education and training efforts are examples of program impacts which influence beneficiary capabilities.

- **Impacts on well-being** which refer to the final program results at the beneficiary-level that are directly related to their food security status and well-being. The impacts of emergency feeding programs may be measured in terms of their influence on the consumption levels of intended beneficiaries, whereas the impacts of agricultural programs may best be measured in terms of changes in crop yields, food production and incomes. For health and nutrition-related programs, impacts on well-being may best be expressed by improvements in nutritional status, as well as reduced morbidity, mortality and fertility.

Diagram 4 outlines in more detail the process by which program outputs ultimately lead to long-term changes in the capability and well-being of program beneficiaries in food security terms.

In any M&E system it will be necessary to identify and monitor indicators which represent key inputs, processes and outputs, in addition to impacts. The ability of programs to effectively transform inputs into outputs will in large part determine the effectiveness of the program in terms of its impacts at the beneficiary level. Without knowing who received what quantity and quality of services at what cost, it is difficult to

interpret the results of impact evaluations in a way that directly supports program decision-making. Indicators of inputs and outputs are typically derived from the routine monitoring of program-based data and reflect the efficiency of program performance. In contrast, impact indicators are typically derived from information at the beneficiary-level (i.e. from participating households or individuals).

In some isolated cases, where program monitoring data has been found to be representative of conditions in the population at large and extensive research has been conducted to confirm relationships between indicators, output indicators may be strongly suggestive of impact. Because of the direct linkage between the program-level intervention and the beneficiary-level impacts in immunization and vitamin A supplementation programs, for example, the use of program coverage or service delivery indicators may be used in place of more expensive data on changes in disease prevalence or vitamin A deficiencies to demonstrate impact.

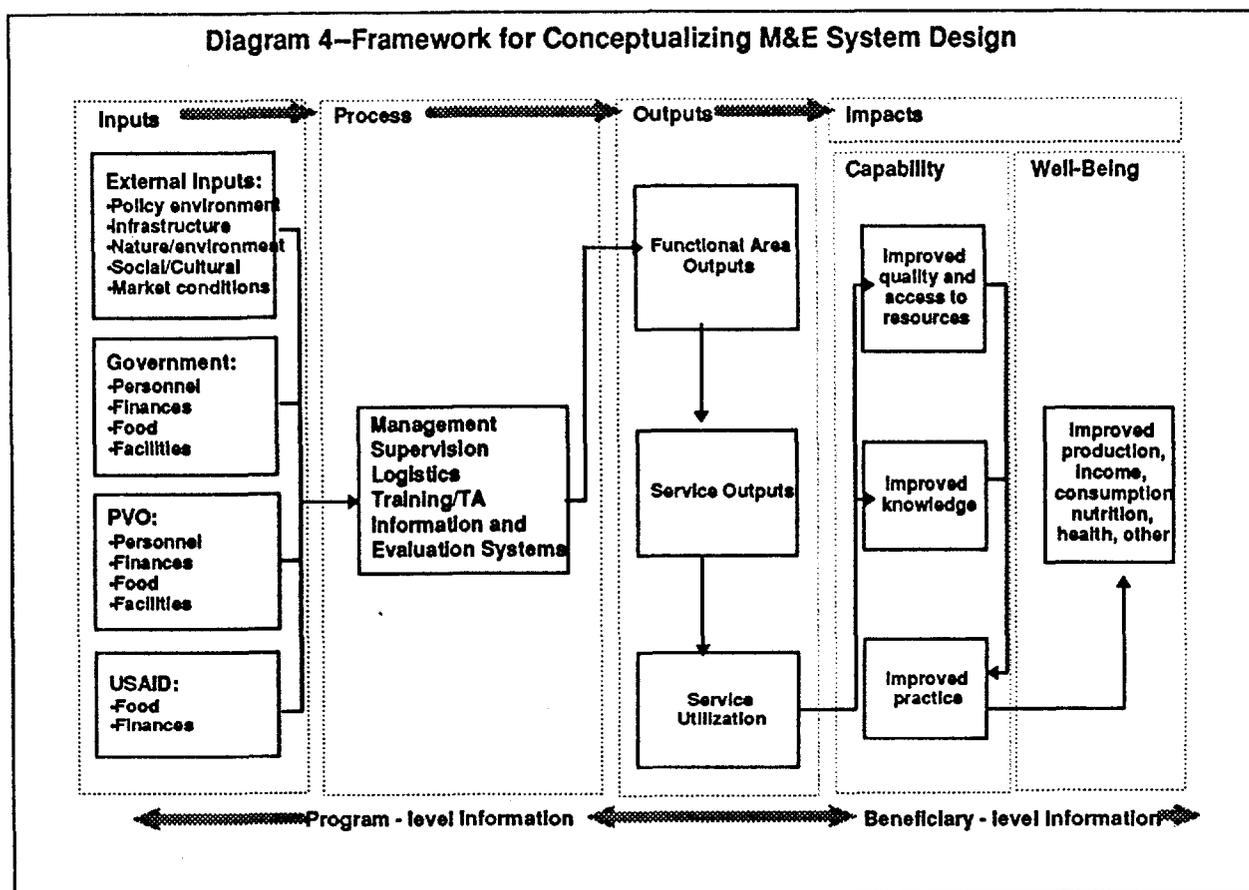
A more detailed understanding of the links between program outputs and improvements in the well-being of program beneficiaries should also clarify the definition of the term impact. In the past, evaluations of food aid programs have often conflated the terms output and impact, focusing primarily on the effectiveness of Cooperating Sponsors to meet program-level targets for food distributions, numbers trained or numbers employed in food-for-work projects (outputs). This approach assumed the implications of those efforts

for improved welfare (impacts). However, the a number of the studies that do exist in this area suggest that these assumed linkages between outputs and impacts are frequently invalid.

Food-assisted programs typically have developed very effective monitoring systems to use in tracking program inputs, processes and outputs; however, few have well-defined information systems to understand project impact. The present Title II program guidelines require an expanded approach to M&E systems, with greater analytical

sophistication, again to establish the role of food-assisted programs in improving the food security status of program beneficiaries.

Boxes 7 and 8 and their accompanying diagrams, which are derived from case studies of two existing Title II programs in South Asia, represent an attempt to organize the programs according to their component parts and link program outputs to their intended impacts. This is the first step in identifying appropriate food security impact indicators for an M&E system.



Box 5--Linking Program Outputs to Food Security Outcomes in a FFW Program

In South Asia, one PVO uses Title II food aid resources, in part, to support a diversified, community-based food-for-work program which focuses primarily on agricultural land development as well as the development of community and market infrastructure, health and sanitation infrastructure, and vocational training activities. The program is implemented on a seasonal basis to help compensate for the regular fluctuation of food prices in the local economies where the program is underway, as well as to avoid competition for labor in periods of peak private sector demand. Inputs into the program are Title II food supplies used as in-kind wages for program participants, technical assistance from CRS in the design and construction of individual projects, as well as limited supplies of cash and materials to complement the labor inputs in the construction of the public assets.

In implementing its program, the PVO distinguishes between wage beneficiaries (those who benefit from the program as the recipients of in-kind wages during slack employment periods) and asset beneficiaries (those who benefit from improved access to, or quality of, the assets created through the program). Given the community-based nature of the program, there is often a great deal of overlap between the wage and asset beneficiary categories. Often, the asset beneficiaries include entire communities who benefit from improved roads and other community assets created through the program.

In Diagram 5, the intended food security impacts of the FFW program are highlighted. Although the actual components of the program are quite diverse, they can be linked to a relatively small set of food security outcomes. The nature of these outcomes can also be distinguished by beneficiary type. For wage beneficiaries, the anticipated effects are primarily through improved access to food through in-kind wages and, in particular, the expected smoothing of seasonal fluctuations in individual food intake levels.

For asset beneficiaries, improvements in agricultural land quality, the availability of cultivable land, and access to water for irrigation are expected to have an important influence on crop production and, ultimately, food access as well. To the extent that cash crop production is also increased, greater food access may also be achieved as a result of higher cash incomes. In the medium- to long-term, improved literacy and market access from improved roads are also expected to lead to greater food access through enhanced income-earning potential. Finally, greater literacy, improved health and sanitation infrastructure, and improved housing are expected to lead to the improved health status of asset beneficiaries and, thereby, improved food utilization.

Given the objectives of this program, the key output and impact indicators discussed for the monitoring and evaluation of this program include measures of increases in arable and irrigated land brought under production, numbers of workdays created, measures of food and cash crop production, as well as measures of food consumption and incomes.

Diagram 5--Intervention Model for PVO Food-for-Work Project

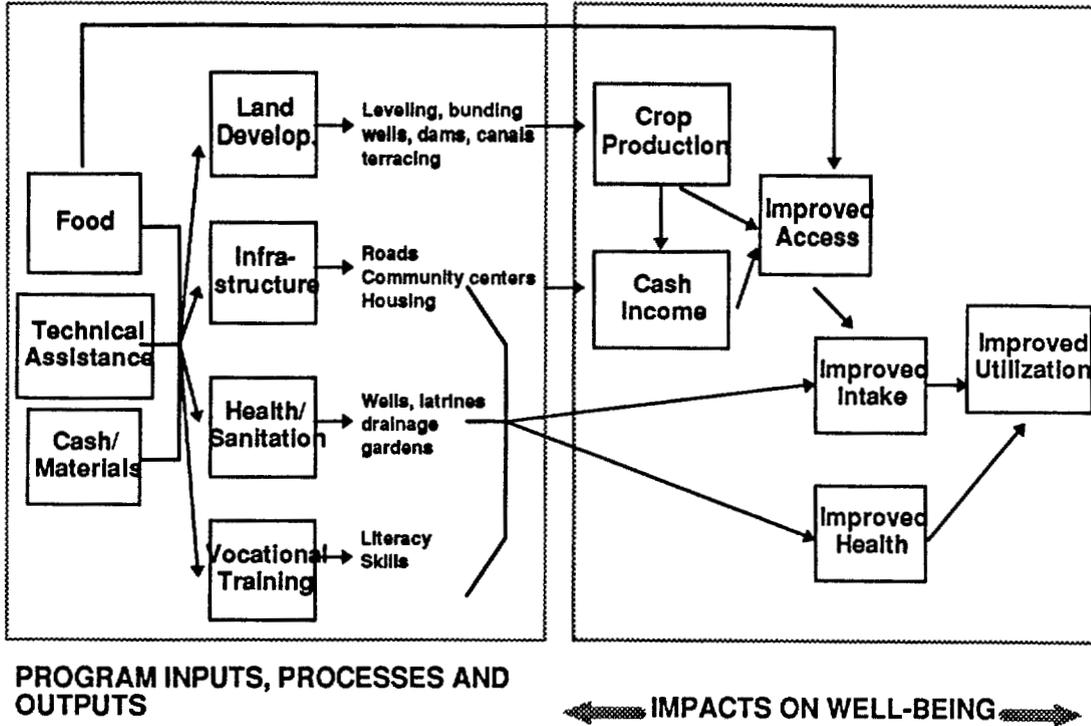
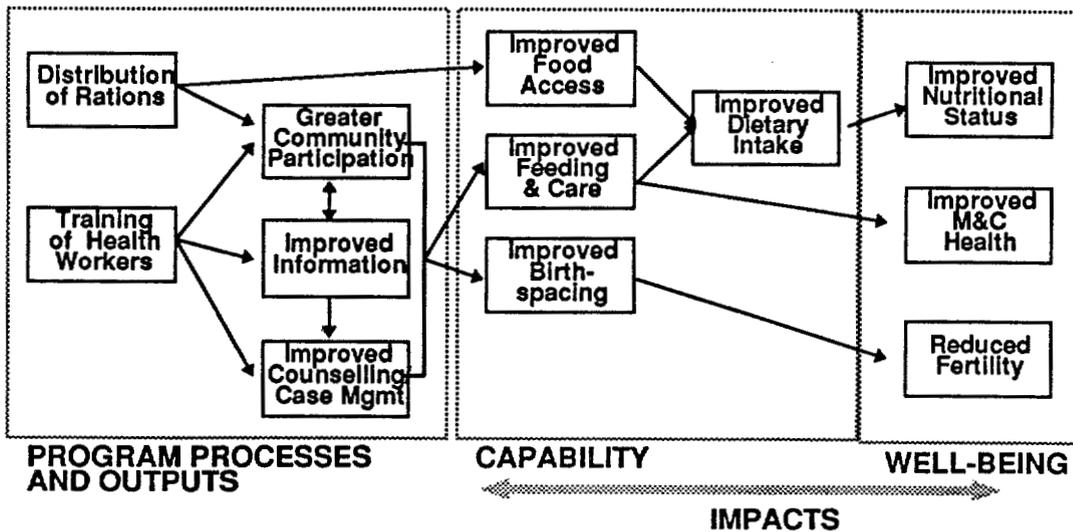


Diagram 6--Intervention Model for a PVO MCH Program



Box 8--Linking Program Outputs to Food Security Outcomes in an MCH Program

In another South Asia example, a PVO uses Title II food aid resources to support its efforts in improving maternal and child health in selected regions of a nation-wide, government-sponsored MCH program. Inputs into the program include Title II food supplies, which are used as supplementary rations for clinic-based feeding of children and pregnant and lactating women, as well as a training program for local health workers and government counterparts. Training efforts are focused on (a) the means to achieve the greater participation of vulnerable groups in the program; (b) the improved use of information by health workers and mothers, particularly the use of growth monitoring information for growth promotion; (c) the improved counseling of mothers on nutrition, particularly on complementary feeding and weaning of infants; and (d) improved case management of diseases, as well as counseling on birth spacing methods.

Diagram 6 indicates the intended impacts of the MCH program. The distribution of rations is intended not only to increase food access of targeted groups, but also to encourage greater participation in the program's other activities. Improved participation of targeted vulnerable groups, along with the improved use of growth monitoring data and improved counseling, are expected to positively influence the feeding practices and levels of food intake of program beneficiaries. The emphasis on growth promotion is intended to support the use of food aid rations to prevent children from becoming malnourished, or more malnourished, thereby making the optimal use of limited food aid resources. With improvements in (a) access to food in the form of supplementary rations, (b) dietary intake as a result of counseling in nutrition practices, (c) the participation of vulnerable groups, and (d) the timing of supplementary feeding during the faltering stage, the expected food security impacts of the program are better food access and utilization and the improved nutritional status of program beneficiaries. Improved health and reduced fertility are also expected impacts on the well-being of the MCH program participants, which should have mutually reinforcing influences on utilization and nutritional status as well.

Given those program goals, the key indicators identified for the monitoring and evaluation of program outputs and impacts are measures of the participation of targeted groups in the program (program coverage), immunization coverage, complementary feeding and breastfeeding practices, as well as nutritional status.

Uses of Program Monitoring and Impact Evaluations

Program monitoring relates to the routine collection of information on an ongoing basis, primarily for improved program management and administration, accountability, and as an initial basis for assessing program impacts. Monitoring establishes that program inputs, activities and outputs have occurred. It also tracks progress over time in the access to and quality of services for beneficiaries. The questions in **Box 9** outline the set of issues which can be effectively addressed through program monitoring.

Program monitoring generally captures the process of translating inputs to outputs. In the case of an MCH program, for example, illustrative input indicators might include the cost and supply of various drugs and food commodities, the number and salary costs of field staff at any given point and the current availability of vehicles for the distribution of those supplies. Output indicators might include the percent of women and children receiving immunizations or supplementary food rations, the percent of eligible women reached by vitamin A supplementation, and the number of mothers participating in nutritional education activities. Monitoring program outputs is a critical aspect of evaluating programs. Again, without knowing who received what quantity and quality of services at what cost, it is difficult to interpret the results of impact evaluations.

Impact evaluations are designed to gauge the extent to which a program causes changes in food security conditions at the beneficiary-level. Again, addressing this function is at the core of the Title II guidelines. Results from impact evaluations are critical to guide the management of current activities, to allocate resources across program components and inform the design of future interventions to maximize their potential impacts. Evaluations can also be used to examine the financial viability of the program, whether the best use has been made of available resources, whether costs can be reduced without undermining impact or benefits extended for the same cost. The questions in **Box 10** outline the issues which are typically addressed through impact evaluations. **Table 2** provides greater details regarding the differences between monitoring and evaluations.

While it may be relatively straightforward to describe cause and effect relationships conceptually, as outlined above in the USAID food security framework, it is generally more difficult to demonstrate impact empirically. Most food security outcomes are influenced by a variety of factors which may or may not be within the control of the program.

Box 9--Questions Answered by Program Monitoring

The following represents the questions which are typically addressed through program monitoring activities:

1. *Were the scheduled activities carried out as planned?*
2. *How well were they carried out?*
3. *Did the expected changes occur at the program-level in terms of:*
 - *improved access to services;*
 - *improved quality of services; and*
 - *improved use of services by program beneficiaries?*

Source: Bertrand, J., et al, op cit.

For example, in spite of a well-designed and well-functioning MCH program, the nutritional status of children may be observed to deteriorate over the life of the project, perhaps as a result of worsening market conditions which limit household access to food and which may dilute the beneficial impacts of the MCH program itself. Conversely, under conditions of general and rapid income growth, improvements in nutritional status over time may be less attributable to the activities of the program and more a result of overall economic conditions.

Again, these external factors which can mask the actual impact of food aid programs are typically termed **confounding factors**. One of the goals of impact evaluations is to

separate the effects of those external, confounding factors from the impacts which can be attributed to the programs themselves (see **Diagram 7**).

The strategy that is used to isolate the impact of the programs from external factors and to achieve some degree of attribution is called the **evaluation design**. There are a wide variety of designs for

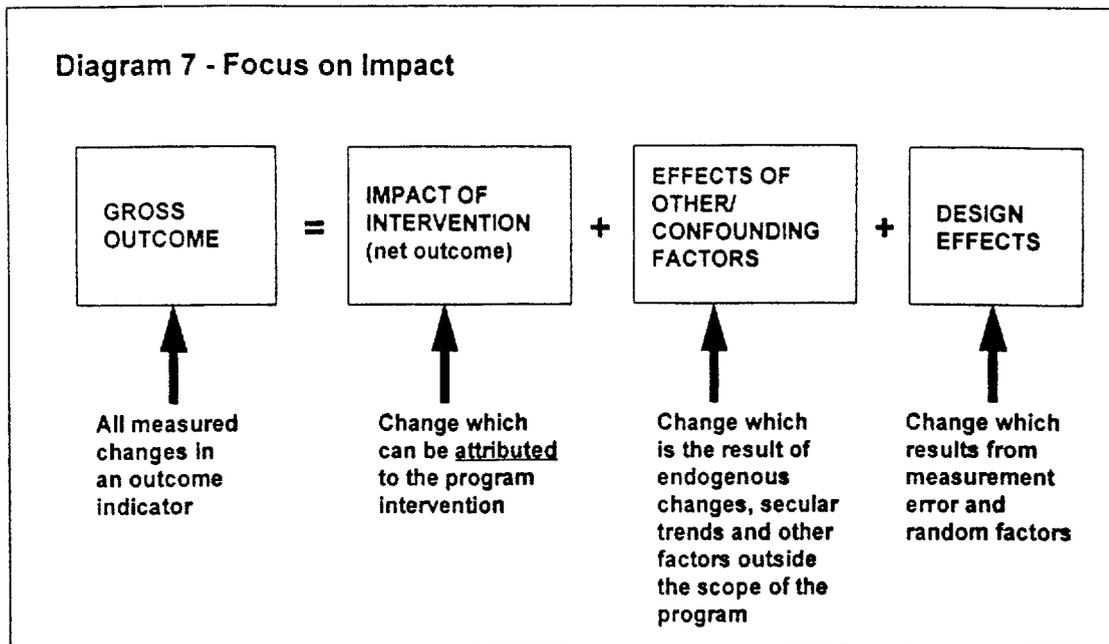
impact evaluations with varying degrees of complexity (see **Table 3**). However, all evaluation designs employ one, or some combination of two basic approaches:

Box 10--Questions Answered by Program Evaluations

The following represents the questions which are typically addressed through program evaluations:

- Is the program effective in achieving its intended goals?
- Can the results of the program be explained by some alternative process that does not include the program?
- What change and how much change occurred at the program or beneficiary level that is attributable to the program?
- What is the cost per unit of output achieved by the program?
- Is the program an efficient use of resources to meet intended impacts as compared to alternative uses?

Source: Bertrand, J., et al, op cit.



- **Reflexive group designs**, which entail measuring changes in food security indicators over time, such as the period between a baseline and final evaluation or more frequent measurement intervals, and:
- **Comparison group designs**, which involve making comparisons of food security conditions between program participants and non-participants, or across population groups who have had varying levels of participation in the program.

Each of these approaches have their own strengths and weaknesses which must be clearly understood in the context of each selected food security impact indicator. If an increase in crop yields is the selected objective of a food-assisted agricultural development program which distributes seeds and implements to farmers, for example, the risk of drought in the final evaluation

period may imply that crop yields are actually lower than in previous periods.

To ensure that program impact is adequately captured in the analysis, it may be necessary to compare yields between program participants and non-participants in the final drought year, to illustrate that participants were better off than those not covered by the program, indicating a positive program impact. Similarly, while a simple comparison may indicate that participants in an MCH program have lower malnutrition rates than non-participants, it is difficult to attribute that result to the program without some idea of their relative malnutrition rates prior to the intervention as well. Often, a combination of both reflexive and comparison group approaches can considerably strengthen the conclusions of an evaluation. It is clear that evaluation designs vary considerably in both their sophistication and cost. The

Table 2**Complementarity between Monitoring and Evaluation**

Item	Monitoring	Evaluation
Frequency	periodic, regular	episodic
Main action	keeping track/oversight	assessment
Basic Purpose	improve efficiency, adjust work plan, accountability	improve effectiveness, impact, future programming
Focus	inputs, processes, outputs, work plans	effectiveness, relevance, impact, cost effectiveness
Information sources	routine or sentinel systems, field observations, progress reports, rapid assessments	same; plus surveys, studies
Undertaken by	program managers, community workers, community (beneficiaries), supervisors, funders	program managers, supervisors, funders, external evaluators, community (beneficiaries)
Reporting to	program managers, community workers, community (beneficiaries), supervisors, funders	program managers, supervisors, funders, policy makers, community (beneficiaries)

Source: UNICEF (1991): A UNICEF Guide for Monitoring and Evaluation, New York.

Table 3--Conventional Evaluation Designs

Design	Name	Analysis	Delivers
X O	One shot case study	None	Adequacy
O X O	One group pre-/post test (reflexive)	Comparative before/after	Adequacy
Grp 1: X O Grp 2: O	Static group comparison	Compare groups	Adequacy
X (varies) O	Correlational	compare sub-groups and correlate treatment with outcome - control for confounders	Adequacy, some inference on net outcome
Grp 1: O X O Grp 2: O O	Non-equivalent group design (combined)	Compare groups w/ statistical control for confounding	More plausible inferences on net outcome
O O O X O O O	Interrupted time series	Before/after, time series	

O -- observation
X -- intervention

basic and most inexpensive designs, those which simply collect information on the population target group over time, are some of the weaker methods for establishing program impact.

However, in some situations these designs may be preferred where the time frame of the intervention is short and/or the population impacts are well-understood. Emergency relief programs and immunization programs may appropriately employ these strategies. At the other end of the spectrum are sophisticated, large scale longitudinal surveys which are highly rigorous in terms of their ability to establish program impact, but may be inappropriate in scope and cost for a typical PVO food-assisted program.

Qualitative assessment methods, using the tools of participatory rapid assessments, are also important tools in an evaluation context. Qualitative assessments often add useful depth and perspective in understanding problems that cannot be obtained from quantitative measures. Rapid assessments are often quite useful in addressing one-off questions related to program design or management, such as in identifying common consumption patterns or constraints to broader participation in training activities. Given the depth of understanding they can provide, qualitative assessments are particularly useful as starting points for the design of quantitative surveys and identifying key indicators for evaluation purposes. By helping to refine the understanding of issues and focus on the most important aspects of a

problem, the use of qualitative methods can lead to a more cost-effective survey. Finally, qualitative methods are quite useful in the context of **participatory evaluations**, where the insights of the community are obtained as a means of better-understanding program performance.

While the identification of food security indicators is critical to focusing program design and management efforts on ensuring beneficiary-level impacts, the successful use of those indicators and the degree of clarity regarding their interpretation depends on a well-designed evaluation strategy. The current lack of a well-established set of "best practices" in the design of food-assisted program evaluations is a critical gap that must be addressed if the movement to performance-based management is to achieve its ultimate objectives: an improved understanding of program impacts which leads to improved program design and even greater impact on the well-being of program participants.

IV. Food Security Indicators

In most analyses of food security conditions in developing countries, multiple indicators are used to reflect the various dimensions of the problem. Some of the most commonly used types of indicators in the assessment of food security conditions include those related to:

- food production,
- income,
- total expenditure,
- food expenditure,
- share of expenditure on food,
- calorie consumption, and
- nutritional status.⁶

In spite of the common use of a relatively small number of food security indicators in much of the literature on the subject, however, not all programs can necessarily be evaluated across all, or even some, of these criteria. The diversity of Title II food aid programs worldwide is likely to require a number of indicators to effectively capture their impact on the capability and well-being of program beneficiaries.

While some indicators will be applicable across a variety of programs and country contexts and will be fairly generalizable in their definition and use (e.g. anthropometric indicators of child

nutritional status), others may only be usefully defined only at the program level (e.g. specific indicators of child feeding practices). For example, nutritional education programs are likely to have a variety of possible areas of focus, depending on local cultural feeding practices and the nature of nutrition problems in any given program area. Measures of mother's nutritional knowledge, which are potentially useful impact indicators of improved capability, should focus on the key messages targeted in a specific training program.

This section of the handbook will attempt to define an approach to the construction of a range of food security indicators, as well as a set of criteria against which to judge the utility of indicators for the purposes of a specific M&E system. An indicator inventory of generally applicable indicators is presented in the final section of this document.

Indicator Construction

Food security indicators are summary measures of one or more of the dimensions of food security used to demonstrate change or the result of a program activity for a target population. Indicator construction begins with a set of observations, or measurements, of food security-related conditions at the level of the individual, the household, the community, the market, or the region. Once the basic measurements have taken place, indicators are constructed by classifying individual observations according to a set of criteria (food secure/food insecure,

⁶See, for example, Chung, K., et al, (1994): "Alternative Approaches to Locating the Food Insecure: Evidence from South Asia," Final Report to the USAID Food Security and Nutrition Monitoring Project, Office of Health and Nutrition, September.

malnourished/well-nourished), aggregating the individual observations to the level of program coverage and placing those observations in some program-relevant perspective (see **Box 11**).

Measurement. As indicated above, there are many commonly used measures that can reflect the various dimensions of food security. In addition, there are usually a number of ways of measuring any single indicator. For example, an indicator defined as the "average total calorie consumption per capita" may be measured through a detailed dietary intake survey based on the weighing of food portions by survey enumerators, or from information based on a 24-hour recall of survey respondents. Similarly, measures of household income can be derived as a lump sum estimate based on the recall of a household head over the past month, or as an aggregate of income from individual household member activities based on individual recall. Obviously, decisions regarding the measurement of indicators are critical to their eventual credibility, cost and interpretation.

In some cases, there is international consensus on either measurement or analysis protocols for an indicator. The World Health Organization, for example, has published recommended methods for obtaining anthropometric measurements and developing indexes for wasting, stunting and underweight. Standard definitions for certain aspects of infant feeding such as exclusive breastfeeding and timely

complementary feeding are also available.

For other indicators, no such standards exist. In these cases indicators should be defined in ways that are appropriate to the local food security conditions and the needs of the program. In areas where women have traditionally not worked for wages outside the household, as in some Moslem cultures for example, it may be misleading to include women in the pool of eligible working adults when calculating a dependency ratio. Where program capacity is limited, it may only be feasible to obtain consumption estimates based on respondent recall, rather than extensive food weighing methods.

Classification. Often, it is important to determine whether or not a household or individual is actually food insecure or actually malnourished. This classification requires establishing some basic criteria for making that evaluation. And, to ensure the ability to make effective comparisons of indicators, it is usually important to make those criteria explicit. While it is always possible to examine relative levels of food insecurity or rank orders defined by specific indicators, it is often desirable to define cut-off points to establish absolute levels of food insecurity.

For some indicators, again, commonly accepted conventions for cut-points exist, although they may be difficult to justify on technical or objective grounds. For example, using the definition of underweight, malnourished children are

often defined as those who are more than 2 standard deviations below the median weight of a reference population of the same age group -- a cut-off point that is something of an "industry standard". For other indicators, cut-off points might need to be defined according to the local context. An indicator of the percentage of food deficit households would depend,

vary across populations, based on differences in climate, work energy expenditure levels and other factors.

The choice of any cut-off may have important implications for the interpretation of an indicator and an understanding of food security conditions. While food insecure households are often defined as those consuming less than 80

percent of minimum recommended calories, a reduction in the percentage of households consuming less than 70 percent of recommended calories may suggest important improvements in minimizing extreme food insecurity which would not be fully captured by an assessment of the 80 percent cut-off. Where classification is important, it is often useful to test a range of cut-off points.

Perspective. The final step in constructing an indicator is the aggregation of individual observations and placing those measures in the proper socioeconomic or program perspective. In general, impact indicators should be expressed not just in terms of a numerator (i.e., an absolute number), but should also include a denominator whenever possible. The denominator indicates the

Box 11--What is a food security indicator?

Food security indicators are summary measures of one or more of the dimensions of food security used to demonstrate change or the result of a program activity for a target population. Indicators are constructed from a set of observations, or measurements, of food security-related conditions, which are classified according to a set of criteria, aggregated and placed in some program-relevant perspective.

For example, an indicator of the number of food insecure households based on per capita consumption levels might be constructed by:

- **measuring** the total food consumed by weight and food source within a household,
- **calculating** per capita caloric intake given estimates of the energy content by weight of specific food types and the overall household size,
- **classifying** households according to whether or not they are considered food insecure, by the definition of some minimum cut-off for the level of caloric intake (typically 80 percent of recommended requirements),
- **aggregating** the total number of households considered to be food insecure, and
- **placing** the aggregate number of food insecure households in **perspective** by expressing it as a percentage of the total number of households in the community or project area.

in part, on an estimate of per capita food needs. However, actual food needs

magnitude of the food security problem being tackled, for example, representing

an estimate of the intended program coverage or the size of the intended target group.⁷ Using a denominator -- which implies expressing an indicator as a rate of change, a percentage or other ratio -- adds an important perspective to the interpretation of the indicator, illustrating the extent to which a particular problem has been addressed. For example, reporting on numbers fed in an emergency feeding program or the number of students attending classes in a school feeding program does not give a sense of the extent of the accomplishment because it does not say anything about the total numbers requiring emergency assistance or the total number of school aged children in the community. In contrast, output indicators typically include simple "count" measures, such as the absolute number of rations distributed, in addition to indicators expressed as percentages or ratios.

Choosing Among Indicators

The problem in choosing among indicators for use in monitoring and evaluation is typically not in being able to identify enough possible candidates. There are usually a range of possible indicators that can be identified and that may be useful. And, as stated above, there are often a variety of different ways of actually measuring any given indicator. The problem in choosing specific measures is in how to maximize the quality of the information and its

benefit to decision-making against the costs of collecting, processing and analyzing that information. In deciding which indicator or which measure should be included in an M&E system, several considerations should be kept in mind:

Relevance. Indicators selected should have relevance to local production systems and the food security context. Differentiating income by gender may be of little relevance in cultures where women do not work outside the home or control income generated from their own production. Similarly, there is little point in obtaining data on micronutrient deficiencies, for example, if these are not considered important aspects of food insecurity in a specific program area. In the latter case, existing secondary information on micronutrient-related disease prevalence may be sufficient to monitor those conditions.

Indicators should also relate directly to the objectives, structure and implementation plan of the program. In the context of an M&E system, indicators selected should be those of immediate use for the decision-making needs of program stakeholders. In the case of a food-for-work program involved in road improvement, for example, an indicator of the volume of road traffic may be interesting from a research perspective and may be somewhat suggestive of changes in economic conditions as a result of the road, but may have little direct relevance to program activities or their intended impacts on beneficiary incomes and food security status. In

⁷Carter, L. (nd): "Criteria for the Selection of Performance Indicators," Management Systems International, mimeo.

this example, an indicator of changes in transportation costs associated with the improved road, or in the income generated from the sale of goods transported along the road may be more directly relevant to understanding program impact.

Credibility. The first step in developing a credible indicator is ensuring that it is defined in a way that is universally understood and grounded in accepted practice and theory. For example, while anthropometric measures are widely understood among technical and non-technical staff, indicators of specific feeding practices may have less resonance among non-technical staff and, therefore, may be less persuasive of impact at certain levels of decision-making. Indicators related to the "psychology" of food insecurity, which attempt to capture the degree of anxiety over the ability of individuals to meet their food needs, have yet to be fully tested and, relative to other more widely used indicators, their interpretation remains somewhat uncertain.

A central feature that defines indicator credibility is the degree of objectivity of the indicator. In general, indicators based on a self-evaluation of people's own food security status, such as whether or not they "feel hungry", are less objective than responses to questions related to more objective facts, such as daily meal frequencies. The degree to which these more objective facts can be directly observed by the person responsible for collecting the data, rather than the responses of interviewees, also enhances the

objectivity of the indicator and, therefore, its credibility.

Credibility also reflects a concern for the accuracy of an indicator, which can be influenced by a range of factors. The nature of the sample from which the observations are drawn can have important implications for accuracy. For example, estimates of nutritional status from growth monitoring data may not provide an accurate estimate of overall rates of malnutrition in the target population, since only those children living near a health clinic may participate in the monitoring activities. If those children are more likely to come from wealthier households, a quite plausible situation, then the growth monitoring data may underestimate the actual malnutrition rate.

The ability to control for measurement error also influences the credibility of an indicator. Poorly adjusted scales used in measuring the weight of children in anthropometric surveys may lead to inaccurate measurement, for example. In a study conducted by the World Bank, farmers' crop production estimates were found to be within a relatively accurate range of 10 percent measurement error. In contrast, crop-cutting methods for estimating yields and production resulted in more serious measurement errors, ranging from 10 to 30 percent (Vera, Merchant, and Scott 1988).

Errors in measurement also can result from inaccurate responses by survey participants. This can be due simply to faulty recall, as in attempts to estimate the quantity of foods consumed in the

recent past (week or day). In many cases, measurement errors occur when respondents perceive some benefit to actually manipulating information, such as in under-reporting their incomes in the hopes of qualifying for a feeding program. Again, the ability to observe conditions directly can minimize this source of error and improve indicator credibility. If conditions cannot be observed directly, there may be other methods to improve the accuracy of responses. Where birth data is not recorded, for example, the measurement of a child's actual age may be supported by making reference to the local calendar and other methods to improve the accuracy of the respondent's recollections.

The precision of a measurement may also imply a more or less credible indicator. For example, measuring an individual's age in terms of months, rather than in years, provides a more precise age estimate (although responses to either form of the question may still be inaccurate as a result of faulty recall). Similarly, it is often desirable to measure food quantities consumed during a meal in terms of cup or bowl sizes (where the volumes of those containers are known) rather than rely on respondent recall in units which are not directly relevant to meal preparation.

Finally, a more technical credibility concern relates to the "margin of error" and the "confidence level" of an indicator derived from sample data. These criteria are largely a function of the degree of expected precision in the indicator and the size of the sample from which the

indicator estimate is obtained -- the more an indicator value is likely to vary across a population, the larger the sample size necessary to maintain a given margin of error.

In some cases, established conventions exist which define the acceptable "margin of error" for a given estimate. In the evaluation of the coverage of immunization programs, for example, it is typical to specify that the indicator estimate should be "correct within (plus or minus) 10 percent with 95 percent confidence."⁸ In effect, this statement requires that the sample size should be such that an error greater than 10 percent in an estimate of the immunization rate would occur not more than five times out of every 100 trials or surveys. While no accepted standards currently exist in food security and nutrition-related programs, it will still be important to set some targets for the "margin of error" in evaluation estimates and report those parameters along with the indicators themselves.

Cost. The cost of obtaining an indicator is typically related to the time, personnel and logistics costs associated with data collection, processing and analysis. Again, these costs may vary significantly by indicator and data collection method. Often, the use of low cost indicators may imply difficult trade-offs in terms of their accuracy and

⁸Lemeshow, S. and D. Robinson (1985): "Surveys to Measure Programme Coverage and Impact: A Review of the Methodology Used by the Expanded Programme on Immunization," World Health Statistics 38 (1), pp. 65-75.

credibility which need to be considered in selecting indicators.

For example, indicators derived from existing secondary data are relatively inexpensive, but are often difficult to disaggregate and link directly to program beneficiaries. Therefore, these indicators may be of little value in an M&E context. To the extent that a Cooperating Sponsor's program is integrated into a related host government program, some useful indicators may be available from existing government sources and may simply require selecting out the observations derived from Cooperating Sponsor program locations.

Where program staff are already located in the field and involved in the delivery of goods and services to program beneficiaries, the additional costs of data collection efforts may be slight. This is particularly the case where information is directly necessary for program implementation, such as in the use of growth monitoring data to target the distribution of supplementary food rations. However, typically, this type of information is usually only relevant to those who actually participate in the program and is unlikely to provide any perspective on conditions within the overall population or the intended target group.

While typically more expensive than indicators obtained from secondary data, the cost of survey-based indicators may still vary considerably. Indicators of dietary intake derived from the actual weighing of food portions may be quite labor- and time-intensive and,

therefore, are expensive compared to a similar indicators based on the 24-hour recall of respondents. Again, the trade-off on cost is in terms of the likely accuracy of the indicator.

Survey-based data collection efforts typically involve a set of relatively fixed start-up costs related to the recruiting and training of enumerators and the purchase of necessary transport and equipment. Once those basic costs have been incurred for the collection of one indicator, again, the additional cost of collecting information on another indicator may be slight. However, the relative ease of collecting additional information, once start up costs have been met, often leads to the collection of a large number of indicators. While the additional time necessary in obtaining the information may be slight, the unforeseen costs of data entry, processing and analysis of large amounts of extraneous data be quite large and can often undermine the effectiveness of the survey and analysis.

Finally, while calculating the cost of any given indicator is relatively straightforward, the benefits associated with that additional piece of information may be difficult to define and quantify. If an indicator is used for targeting purposes, it may be possible to estimate its direct benefit in terms of reduced program costs. From a program monitoring perspective, however, where information is used to support on-going management decisions, it may be more difficult to separate the effects of the information from the quality of the management staff and other factors.

Estimating the benefit of including a particular indicator in an impact evaluation is even more complex, and would depend on the extent to which that information was actually used to effect change in the design or management of the program and, the extent to which those changes led to improved program impact.

Comparability. Comparing the impacts of one program to those of another is a critical function in the management of food-assisted programs. Understanding why a nutrition program in one region had a more substantial impact on feeding practices, compared to a similar program in another region is one example of the usefulness of making comparisons across programs in informing program design. Another central concern for comparability is one of making resource allocation decisions between programs or program components. Simply put, programs that are more (cost-) effective in promoting improvements in food security conditions are likely to receive more funding than those that are less effective.

Comparability first requires that indicators are conceptually equivalent. Obviously, an assessment of the percentage of food insecure households based on measures of dietary intake cannot be compared to similar percentages based on the level of per capita food expenditures. Conceptual differences in indicator definitions can also be more subtle. Poverty estimates for example, are often based on cut-off points for income or expenditures

defined by some estimate of the value of "minimum basic needs". However, because the definition of minimum basic needs may vary in both quantity and quality terms from country-to-country, different countries' poverty lines may reflect quite different standards of living and may not be readily comparable.

Differences in data collection methods for the same indicator, which imply that measurements may be more or less accurate, also limit the ability to compare indicators with any degree of confidence. Given even hourly variations in market prices, for example, price estimates based on one observation at a single point in time may be difficult to compare with any confidence to estimates which reflect average prices through the course of a day. In cases where the indicator definition and data collection methods have been standardized, such as with many anthropometric measures, comparability across programs may be more straightforward.

Time Sensitivity. The indicator selected should also be responsive to program activities and outputs within the time frame of the program. This is particularly an issue when evaluating food security programs. In the context of a food-assisted MCH program with an emphasis on family planning, changes in overall fertility rates may not occur in a five-year time frame, while measures of contraceptive prevalence and couple years of protection would. Similarly, school snack programs may not result in immediate improvements in nutritional status within the time frame of a typical

project, although improvements in attendance and, possibly, test scores may be more likely to be observed. The impacts of those activities on nutritional status may be deferred until the point at which the participating school children are able to earn higher incomes as a result of their improved educational achievement and, perhaps as a result of their education, employ more appropriate feeding practices with their own children.

Information use. Related to the issue of program relevance, indicator selection and data collection methods must be closely tied to the intended uses of the information. Data required for needs assessments, targeting, monitoring, and evaluating programs will vary greatly. As already mentioned, growth monitoring data may be quite useful in a program monitoring context to identify the need for supplementary rations in individual cases of undernutrition or growth faltering, but, given its limited geographic coverage, may not be useful in program targeting activities where rapid anthropometric surveys may provide a less biased understanding of general nutritional conditions.

Again, time sensitivity is another important consideration in assessing indicators for various types of information uses. In general, indicators used for food security assessments or for targeting purposes may be relatively static in nature, such as the occupation of the household head or household demographic composition, in addition to indicators which show more variation

over time. For program monitoring, on the other hand, indicators are typically derived from the routine observation of both program input and output indicators at fairly regular intervals over time. In this context, as well as the case of impact assessments, static indicators would be inappropriate. In general, information should only be collected if there is some expectation that the indicators will actually show change within the necessary measurement interval.

Indicator Proxies

As is apparent from the discussion above, some food security indicators are difficult or expensive to measure directly either because:

- the process of measurement is time consuming and expensive, such as in the assessment of dietary intake;
- they reflect complex processes, such as in the recording of total household income derived from a number of household members involved in diverse economic activities, or total household expenditures; or
- respondents perceive there is some incentive to distort their responses, as in the case of the under-reporting of incomes levels which may be tied to the targeting of some program benefit.

To overcome these problems, there has been considerable interest in identifying more reliable or efficient indicators that strongly reflect the food security

dimension of interest. To date, a great deal of research has gone into identifying proxy indicators for household income or wealth, for example (see **Box 12**).

Promising approaches are also being developed for the assessment of vitamin A dietary intake through the use of food frequency recall data. This information is much more practical to obtain than either quantitative dietary recalls or biochemical measures and is thought to capture the essential information about the adequacy of vitamin A intake. Assessing the overall energy adequacy of diets through meal frequency measurement is another approach that may also be useful in certain settings.

One major disadvantage to the use of proxies is that they are typically context-specific, with relationships between a direct indicator and its proxy likely to be stronger in one setting than in another. For example, the same indicators of water source or the materials used in housing construction may not be useful in capturing differences in income across both farming and pastoralist populations. Usually, proxy indicators must be tested in each new setting, implying the collection of the direct indicator, as well as a range of possible proxies. This is typically an expensive undertaking which undermines part of the attractiveness of using proxies. The value of this approach increases with the intended frequency of using the proxies, in program monitoring, for example, or in the screening of applicants for program participation over time. For impact evaluation purposes, however, where data collection activities

may be relatively infrequent, the cost-effectiveness of the proxy indicator approach may be quite limited.

In addition to considerations of cost and credibility, proxy indicators must also be evaluated on the criteria of program relevance, time sensitivity and intended information use. The indicators listed in **Box 12** underscore a potential difficulty in using proxies in the context of an M&E system. In the case of a food-for-work program intended to promote higher incomes through improved soil and water conservation methods, for example, variables listed in **Box 12** such as gender of household head, size of family and home construction materials are unlikely to vary in the short-term as a result of the program activities. Therefore, they would not capture directly or indirectly any of the potential impact of the program on incomes. Changes in the ownership of key assets, particularly smaller consumer goods such as radios, may be more useful in capturing short-term aspects of income changes, but may themselves be somewhat difficult to interpret given a range of possible confounding factors which might also influence asset ownership.

Box 12--Alternative Indicators of Income

The following are examples of alternative indicators for incomes that have been identified by the World Bank (1993):

- the gender of the household-head;
- the availability of working-age individuals within the household;
- ethnic background or social class or caste;
- the size of a family dwelling or its number of rooms;
- the type of materials used in the construction of the roof, floor and walls of a dwelling;
- the method of water collection and sanitation available;
- the ownership of key assets, such as land, and luxury goods, such as radios; and
- the geographic location of households.

Proxies for income are often desired because they are less time consuming to collect and, therefore, less expensive. More importantly, given the concern for under-reporting of incomes from respondents, proxies are thought to be more easily observed by the survey enumerator and, therefore, more credible. At the same time, there is rarely a one-to-one relation between changes in direct indicators and changes in their proxies. Thus, the use of proxies involves a trade-off of one potential set of biases against another set of biases.

V. Indicator Inventory

This section of the handbook is intended to identify and provide concise definitions of those food security indicators which are thought to be more generally applicable in the analysis of the impact of Title II food aid programs. Detailed definitions of these key indicators are intended to promote their consistent and appropriate use across programs, countries and institutions. In this way decision-makers within the Cooperating Sponsor institutions and within the U.S. Government will be better able to use the information from M&E systems to manage their Title II food aid programs.

Consistency in indicator definition and use is critical not only in identifying the degree of effectiveness of any given program, but also in identifying the generalizable factors which ensure that effectiveness across programs. This understanding is essential to derive lessons for effective program design in the future. Similarly, by providing some basis for comparison across programs of various types, consistency in indicator definition and use will also support the more effective allocation of increasingly scarce food aid resources across programs.

The following section provides a short list of generally applicable food security impact indicators, with some assessment of their usefulness, according to the criteria defined in Section IV above: **program relevance, credibility, cost, comparability and time sensitivity**. As indicated in Section IV, the utility of specific indicators according to these

criteria may vary by their precise definition and methods used in data collection -- as in the differences between the potential uses and cost of anthropometric indicators derived from growth monitoring programs and those derived from population-based sample survey efforts. Therefore, it is assumed for the purposes of this evaluation exercise that the indicators listed are those derived from population-based sample surveys and used in the context of an evaluation of program impact.

Since the literature on the evaluation of food-assisted programs is somewhat limited, this indicator list was derived from the general food security and nutritional surveillance literature. Again, the focus is on impact indicators -- primarily measures of well-being, which have been grouped according to the dimensions of food availability, access and utilization. Some indicators of practice, especially regarding infant feeding practices, are also included; however, these indicators of improved capability tend to be more program-specific and more difficult to generalize.

Although critical to effective impact evaluations, the present list also contains little discussion of program-level output indicators. An exception is a brief discussion of program coverage indicators, such as immunization rates, which are known to be strongly suggestive of impact. While somewhat generalizable, output indicators also tend to be somewhat more program-specific. A future draft of this document will contain a more detailed treatment of both indicators of capability and program output indicators.

Following the list of indicators are detailed profiles of selected indicators which are intended to provide a concise definition of the indicator, as well as a discussion of issues related to the measurement and use of the indicator. Again, the indicators contained in the list and detailed in the indicator profiles constitute only a preliminary set of the full range of indicators to be included in a future draft of this document

Indicator Type	Program Relevance							Credibility	Cost	Comparability	Time Sensitivity
	Humanitarian Feeding	Food-For-Work	Maternal & Child Health	Child Survival	School Feeding	Other Child Feeding	Monitization				
FOOD AVAILABILITY											
Average per capita crop production		X					X	M	M	M	M
Average per capita calorie availability		X					X	M	M	M	M
Average per capita area planted/harvested		X					X	M	M	M	M
Average crop yield		X					X	M	M	M	M
Average per capita household food stocks	X	X					X	L	H	L	M
FOOD ACCESS											
Indicators of Income and Expenditure											
Average per capita income	X	X					X	L	H	L	L
Average per capita expenditure	X	X					X	M	H	M	M
Average share of expenditure to food	X	X					X	M	H	M	M
% of HHs below poverty line (total exp.)	X	X					X	M	H	M	M
% HHs below poverty line (food exp.)	X	X					X	M	H	M	M
Indicators of Socioeconomic Status											
Average per capita land ownership	X	X					X	M	M	M	L
Average per capita livestock ownership	X	X					X	L	M	M	M
% HHs modern housing construction materials	X	X					X	H	L	M	L
Average number of rooms per HH	X	X					X	H	L	M	L
% HHs with access to latrines	X	X					X	H	L	M	L
% HH with access to clean water source	X	X					X	H	L	M	L
Average level of education of mothers/HH head	X	X					X	M	M	M	L

Indicator Type	Program Relevance										
	Humanitarian Feeding	Food-For-Work	Maternal & Child Health	Child Survival	School Feeding	Other Child Feeding	Monitization	Credibility	Cost	Comparability	Time Sensitivity
% mothers and HH heads employed	X	X					X	M	M	M	M
% mothers and HH heads with various occupations	X	X					X	H	M	M	M
Indicators of Market Conditions/Access											
Average distance to market	X	X					X	M	M	M	L
Average distance to road	X	X					X	M	M	M	L
Average consumer prices	X	X					X	M	M	L	H
Average producer prices	X	X					X	M	M	L	H
Average wage rate	X	X					X	M	M	L	H
Average livestock/cereal terms of trade	X	X					X	M	M	L	H
Average wage/cereal terms of trade	X	X					X	M	M	L	H
CONSUMPTION/UTILIZATION											
Indicators of Food Consumption											
Mean daily energy intake	X	X	X			X	X	M	H	M	H
% HH consuming < 80% rec. calorie intake	X	X	X			X	X	M	H	M	H
Average frequency of consumption (food type)			X	X			X	M	L	M	H
% HH/individuals consuming animal products		X	X				X	M	L	M	H
% HH/individuals consuming vitamin A-rich foods			X	X				M	L	M	H
% HH/individuals consuming < 2 meals/day		X	X			X	X	M	L	M	H
Indicators of Health and Fertility Status											
Period prevalence of disease			X	X				L	L	M	L
Infant mortality rate	X		X	X				H	M	M	L

Indicator Type	Program Relevance							Credibility	Cost	Comparability	Time Sensitivity
	Humanitarian Feeding	Food-For-Work	Maternal & Child Health	Child Survival	School Feeding	Other Child Feeding	Monitization				
Child mortality rate	X		X	X				H	M	M	L
Crude death rate	X							H	M	L	L
Maternal mortality rate			X					M	H	M	L
Median length of birth intervals			X	X				H	M	H	L
% births to women above/below specific ages			X	X				H	M	H	L
Prevalence of diarrhea in children < 5 years			X	X				M	M	M	L
Prevalence of acute respiratory tract infection			X	X				M	M	M	L
Prevalence of fever in children < 5 years			X	X							
Indicators of Nutritional Status											
% children with growth faltering			X	X		X		H	M	M	M
Prevalence of low arm circumference	X		X	X		X		M	L	L	H
Prevalence of stunting	X	X	X	X		X	X	H	M	H	M
Prevalence of wasting	X	X	X	X	X	X		H	M	H	M
Prevalence of underweight	X	X	X	X	X	X	X	H	M	H	M
Indicators of Infant/Child Feeding Practices											
Prevalence of separate meal preparation			X			X		L	M	M	M
Prevalence of timely complementary feeding			X	X		X		M	H	M	M
Average frequency of consumption/compl. foods			X	X		X		M	M	M	M
Average quantity of consumption/compl. foods			X	X		X		M	H		
Prevalence of colostrum consumption			X	X				M	M	H	L
Prevalence of breastfeeding initiation			X	X				H	L/M	H	L
Median duration of breastfeeding			X	X				M	M	H	M
Extended breastfeeding rate			X	X				M	H	H	M

Indicator Type	Program Relevance							Credibility	Cost	Comparability	Time Sensitivity
	Humanitarian Feeding	Food-For-Work	Maternal & Child Health	Child Survival	School Feeding	Other Child Feeding	Monitization				
Prevalence of exclusive breastfeeding			X	X				H	H	H	M
Indicators of Micronutrient Deficiency											
Prevalence of consumption of Vitamin A fort. foods			X	X				M	L	M	M
Prevalence of night blindness			X	X				M	M	M	M
Prevalence of low serum retinol			X	X				H	H	H	M
Proportion of HH using adequately iodized salt			X					H	M	H	M
Prevalence of iodine supplementation			X					M	L	M	M
Prevalence of low thyroid stimulating hormone levels			X					H	H	H	M
Prevalence of low urinary iodine levels			X					H	H	H	M
Prevalence of cretinism			X					M	M	M	L
Prevalence of goitre			X					M	M	M	M
Prevalence of low serum ferritin			X					M	H	H	M
Prevalence of low hemoglobin or hematocrit			X					M	H	H	M
Prevalence of iron supplementation			X					H	L	H	H
Prevalence of consumption of iron fortified foods			X					L	M	M	L
Indicators of Program Coverage											
General program coverage	X	X	X	X	X	X	X	M	L	M	H
% individuals receiving vitamin A supplementation			X	X				H	M	H	H
% children fully immunized			X	X				H	L	H	H
% mothers immunized for tetanus toxoid			X	X				H	L	H	H