

# Incorporating Nutrition into Project Design

Leslie Kennedy Elder  
Lynnda Kiess  
Joy de Beyer

May 1996

Human Development Department  
The World Bank

This report is Tool #1 in the World Bank's Nutrition Toolkit. The purpose of the Toolkit is to help World Bank staff design and supervise effective and feasible nutrition projects and project components and to carry out comprehensive analysis of sectoral and policy issues affecting food consumption and nutrition.

For more information, contact the Nutrition Group of the Human Development Department, HCDVP at (202) 473-2521.

<b>Acknowledgments</b> . . . . .	<b>vii</b>
<b>1 Introduction</b> . . . . .	<b>1</b>
Background . . . . .	1
Structure and purpose of the tool . . . . .	2
<b>2 Project Identification</b> . . . . .	<b>5</b>
Task 1. Determine presence and extent of malnutrition . . . . .	6
Task 2. Investigate determinants of malnutrition . . . . .	11
Task 3. Critically evaluate existing nutrition programs . . . . .	16
Task 4. Assess institutional capacity . . . . .	18
Task 5. Identify research needs . . . . .	20
<b>3 Project Preparation</b> . . . . .	<b>23</b>
Task 1. Select intervention strategies . . . . .	23
Objective: Decrease the incidence of low birth weight . . . . .	25
Prenatal care . . . . .	26
Supplementary feeding . . . . .	27
Objective: Reduce child malnutrition and growth failure . . . . .	30
Communication and nutrition education . . . . .	30
Counseling and growth promotion . . . . .	32
Supplementary feeding . . . . .	33
Prevention/treatment of disease . . . . .	33
Curative nutrition rehabilitation . . . . .	34
Objective: Decrease micronutrient malnutrition . . . . .	35
Fortification . . . . .	35
Supplementation . . . . .	37

Dietary change . . . . .	39
Policy change . . . . .	39
Objective: Reduce poverty and household food insecurity . . . . .	40
Food policy reform . . . . .	40
Actions for household food security . . . . .	41
Safety nets . . . . .	42
Income-generation programs combined with nutrition education . . . . .	42
Objective: Improve educability of school-age children . . . .	43
Deworming . . . . .	43
Micronutrient supplementation . . . . .	44
School feeding . . . . .	44
Nutrition communication . . . . .	44
Task 2. Begin to design the project . . . . .	45
Task 3. Plan for the monitoring and evaluation system . . . . .	49
Task 4. Initiate economic analysis of intervention options . . . .	52
<b>4 Project Pre-Appraisal/Appraisal . . . . .</b>	<b>55</b>
Task 1. Evaluate project technical content . . . . .	55
Task 2. Assess monitoring and evaluation system . . . . .	56
Task 3. Appraise project targeting . . . . .	57
Task 4. Appraise training and supervision plans . . . . .	58
Task 5. Assess institutional capacity . . . . .	59
Task 6. Finalize economic analysis of the project . . . . .	60
Task 7. Assess financial viability . . . . .	61
Task 8. Procure inputs . . . . .	62

**5 Project Implementation and Supervision . . . . . 63**

Task 1. Support project implementation . . . . . 63

Task 2. Supervise the project . . . . . 67

**6 Project Completion/Evaluation . . . . . 69**

**Appendices**

1. Assessment of Nutrition Status: Anthropometric Indices . . . . . 71

2. Assessment of Nutrition Status: Clinical and Biochemical Indicators . . . . . 77

3. Micronutrient Supplement Dosages . . . . . 82

4. Assessing Quality of the Data . . . . . 85

5. Data Sources . . . . . 87

**References . . . . . 95**

**Boxes**

1. Feeding Programs . . . . . 28

2. Nutrition Communication . . . . . 31

3. Lessons of Experience: Fortification . . . . . 37

4. Lessons of Experience: Supplementation . . . . . 38

**Tables**

1. Answering the Question: Is Malnutrition a Problem? . . . . . 7

2. Program Options for Addressing Malnutrition . . . . . 24

3. Decision Matrix and Program Options for Iron, Iodine,  
and Vitamin A Deficiencies . . . . . 36

A1. Proposed Classification of Worldwide Prevalence Ranges  
of Stunting and Wasting among Children Under 5 Years of Age . . . . . 74

A2. Regional Prevalence of Underweight Children (0–60 months)  
in Developing Countries (1990) . . . . . 74

A3. Biological Indicators of Subclinical Vitamin A Deficiency in Children  
6–71 Months of Age . . . . . 78

A4. Iodine Deficiency Disorders Prevalence Indicators and Criteria  
for Public Health Problem . . . . . 80

A5. Hemoglobin Cutoffs Used to Define Anemia  
(Hb below these levels indicates anemia) . . . . . 81

A6. Vitamin A Prophylaxis Schedule . . . . . 83

A7. Recommended Schedules for Iron and Folate Supplementation . . . 84

## Acknowledgments

**T**his paper benefited greatly from the discerning comments and substantive contributions of Judith McGuire and Kathy Lindert.

## ***Background***

**N**utrition is everyone's problem and no one's business: a complex, cross-sectoral issue that routinely slips through the planning cracks. Death certificates rarely cite malnutrition as the cause of death, so its pervasive contribution to mortality is routinely underestimated. It is frustrating to try and orchestrate coordinated action across ministries, and nutrition has historically been relegated to positions of little political power and low budgetary influence within health and/or agriculture bureaucracies. For all of these reasons, nutrition project design and implementation pose special challenges that demand more than generic advice.

Discussions of the determinants of malnutrition are necessarily wide-ranging; the root causes are embedded in the political, economic, and physical environment, and are bound up in broad issues of poverty, equity, and basic human rights. The immediate causes of malnutrition are more clear-cut: a triangular constellation of insufficient availability of food and nutrients at the household and individual level, adverse nutrition behaviors (feeding, dietary habits, hygiene) and poor health, particularly infectious disease.

One or more of these factors must be present for malnutrition to be a problem, but more frequently all are present in varying degrees. It is important to identify and address each of the factors through the proposed project or in the larger context of a national nutrition strategy. Dealing with only one may have little impact if others continue to operate. For example, there is a common misconception that inadequate food availability alone causes malnutrition and that increasing family income will solve the problem. The reality is that most households could provide adequate amounts of food for their preschool children through more optimal allocation of existing resources. So, while increasing income may help, it is usually not enough by itself. To be effective, the extra income must be used to provide the vulnerable individuals with the right nutrients in the right amounts at the right times.

It is important to address the visible conditions of severe protein-energy and micronutrient malnutrition as well as the less obvious conditions of “hidden hunger” in which detectable symptoms of nutritional deficiencies are not present. The latter situation is more prevalent, and its effects profound (e.g., reduced immunity, fatigue, mental impairment, lower productivity, and increased mortality rates), yet the condition may not be identified as malnutrition.

Many examples of hidden hunger exist: undernutrition (low weight for age) affects over one-third of all preschool children in the world, but only a fraction of these ever show signs of severe life-threatening kwashiorkor or marasmus. Yet mildly malnourished children are more than twice as likely to die as well-nourished children. Severe iodine deficiency results in almost 6 million people born with permanent mental retardation (cretinism), but another 200 million people exhibit goiter (enlarged thyroid gland), and nearly 1 billion people live on iodine deficient soils, at risk of iodine deficiency and often affected by mild deficiency disorders that make them apathetic and less productive. Similarly, vitamin A deficiency contributes to the deaths of an estimated 2 million children each year, yet only a small portion of these cases show such overt symptoms of the deficiency as nightblindness.

### ***Structure and purpose of the tool***

The tool is organized along World Bank project cycle lines. At each stage of the cycle there is a key question(s) for the task manager to pose. Tasks are described that should help answer the question. The guidelines in the tool are not exhaustive descriptions of project preparation, and do not address activities such as sector appraisal report production, board presentation and so on. They focus instead on those nutrition-specific details and problems that must be understood and incorporated into project design in order to make a difference—a nutritional difference.

In its function as a set of basic guidelines for the development of a project or component, the level of detail for any given issue or nutrition intervention is minimal. Individual topics are treated more thoroughly in subsequent

tools (for instance, there are tools on economic analysis of nutrition projects or on feeding programs that can be consulted by a task manager when he or she needs them).

While Bank experience points to the fact that a freestanding project commands more serious attention from policymakers and more consistent supervision by Bank staff, we expect that the current trend toward incorporating nutrition components in health, education, agriculture, industry and infrastructure projects will continue. The toolkit is written for the task managers for these projects. Frequently not nutrition specialists themselves, they are designing and supervising nutrition components in collaboration with client country and international technical specialists.

Sector work is not dealt with explicitly in these guidelines. However, the notes on data collection in the Project Identification section are highly relevant for sector work on nutrition, whether as a dedicated report or as part of a broader study (for example of food security, health, poverty or economic development and country strategy). Similar types of data collection and basic analysis would be done for sector work and project identification.

Nutrition is influenced by a wide range of factors going well beyond household food preparation and consumption, commonly assumed to be the primary causes of malnutrition. These factors include health and sanitation, women's time and caregiving capacity, education, and income levels and distribution. Agricultural and food policies affect food production, consumption, and distribution; infrastructure development, extension messages, research, rainfall and other determinants of agricultural output are all powerful influences on nutrition status. Thus it is imperative that economists and others are knowledgeable about and sensitive to the impact of actions and policies in their purview on nutrition, and the impact of nutrition on the development of the country and its population.

In fact, thinking about nutrition only at the start of the project cycle is already late. Country assistance strategies, public expenditure reviews, and country

economic memoranda—“upstream” policy dialogue products—need to include nutrition for several strong reasons. First, nutrition status determines individual well-being and impacts on economic development. General economic analysis and policy discussions provide valuable opportunities to bring this to the attention of staff of finance and planning ministries and other policymakers who may be unaware of the importance of nutrition. The second reason is related: decisions to borrow and budget resources for nutrition are usually made by people other than nutritionists, and basic economic work offers an opportunity for advocacy for adequate resource allocation for nutrition. Third, unanticipated effects of non-nutrition policies can actually harm nutrition. Another tool, *Food and Nutrition Policy*, will examine macroeconomic, trade, and food policy in detail, contributing it is hoped, to an expanded Bank orientation toward issues of nutrition.

## **2** Project Identification

**K**ey Questions: *Is malnutrition a problem? Can it be addressed through a Bank nutrition project or component?*

---

### **Tasks for project identification**

1. Determine presence and extent of malnutrition.
  2. Investigate determinants of malnutrition.
  3. Critically evaluate existing nutrition programs/national nutrition strategies.
  4. Assess institutional capacity.
  5. Identify research needs.
- 

During project identification, data collection and analysis are major tasks. The following questions need to be answered in order to make decisions about the focus of project or component design (Berg et al., 1986).

- What types of malnutrition exist and where?
- How severe is the malnutrition?
- What are the primary determinants?
- What are the broader underlying causes?
- Is there a national nutrition strategy?
- Are existing programs addressing the right problem in the right way for the right people?

**Task 1. Determine presence and extent of malnutrition**

To assess the magnitude of the problem, collect and analyze data related to nutrition status. These include anthropometric, clinical, and biochemical indicators of malnutrition. Sources of data are: national surveys, food and nutrition action plans, World Summit for Children Action Plans, donor surveys (e.g., Demographic and Health Surveys (DHS) and Living Standards Measurement Surveys (LSMS)), and UNICEF situational analyses. Even if surveys are dated, looking at trends over time can be useful contributions to analysis of the current situation. Appendix 5 lists institutional contacts for data sources.

The types of data discussed above can be used to assess the magnitude of malnutrition in a country or region. Table 1 lays out these basic types of information as well as the additional types of data needed to answer questions about the causes of malnutrition (Task 2). In addition to collecting and interpreting the results of existing surveys, and in lieu of mounting large-scale surveys under the project, short-cut methods for determining the situation are recommended. Issues of data quality will surface throughout the project identification stage. See Appendix 4 for questions to answer in assessing quality of pre-existing data, or when designing surveys for implementation under the project.

*Nutrition status.* Nutrition status is assessed in three ways: through measurement of growth and body composition, through analysis of the biochemical content of blood and urine, and by clinical examination/detection of external physical signs of nutrient deficiencies. All three methods of assessment result in data that can be used to answer questions about who is affected by which types (and the severity) of malnutrition, and in what locations.

*Anthropometric indicators.* Anthropometric methods measure growth and body composition. Height and weight are the most common measurements. Anthropometric indices and indicators are then derived from the growth measurements. In order to facilitate international comparisons, the

**Table 1: Answering the Question: Is Malnutrition a Problem?**

Measurement and sources of data

Determinant	Measurement/indicator	Sources of data	Short-cut method	Comments
<b>Nutritional status:</b>				
Anthropometry	Birth weight	Surveys and measurement (e.g., Demographic and Health Surveys, LSMS)	Hospital data Existing clinic data Assess percent of under-five children with MUAC < 12.5 cm (rough indication of severe malnutrition)	Weight-for-age best for children under 3 years. Height-for-age best reflects cumulative inadequacies of health or nutrition.
	Percent of population under age 3 falling below -2Z weight for age, height for age or weight for height			
	Growth faltering rate of population	School height census (measure height of all first graders on first day of school)		Weight-for-height varies with disease and seasonality (highly volatile).
	Percent of population falling below cutoff of Body mass index (BMI), mid-upper arm circumference (MUAC), height, weight	National, regional surveys and nutrition surveillance systems		Age recall is often faulty. Some DHS have women's anthropometry.
Biological measures	Finger prick blood sample (iron, vitamin A, iodine)	Survey and examination	Iodine: topography, soil concentration; intake of iodized salt Vit. A: measles fatality rates; intake of vit. A-rich foods, local words for night blindness Iron: hospital or clinic data on anemia Qualitative/opportunistic surveys (e.g., asking district medical officers about frequency with which they see certain conditions)	Surveys can be expensive and time consuming, but highly accurate methods can reduce sample size.
	Urine sample (iodine)			
	Clinical examination of eyes (vitamin A) or neck (iodine)			

*Continued*

Table 1: (continued)

Determinant	Measurement/indicator	Sources of data	Short-cut method	Comments
Food availability	Mean daily calorie availability at household level (per adult equivalent) Food supply Per capita food production Av. per capita calorie availability Av. per capita crop production Crop yield per acre Share of agricultural earnings by crop (export or total earnings)	Household income and expenditure surveys Early warning systems Food balance sheets Agriculture surveys	Poverty index (e.g., housing quality, land tenure, geographical location) Food storage estimates	Such surveys provide useful data for food policy analysis (price elasticities for example). Be sure to collect amount purchased and price per unit; meals eaten away from home and guests/workers fed. Expenditure surveys tend to underestimate actual expenditures.
Food access/consumption	Cost of minimum food basket vs. household income Av. per capita income Av. per capita expenditure Share of expenditure on food Per capita calorie consumption % hh consuming less than 80% requirements or less than 2 meals/day Income, change in income Hh perception of food security	24-hr. recall or weighed intake Food frequencies Minimum food basket: statistics/price (as part of consumer price index) Household income and expenditure surveys Market surveys Participatory rural appraisal (PRA)	Mean daily calorie intake # meals/day Minimum wage/cost of minimum food basket	Survey data provide no details on intra-household distribution or consumption patterns which often impact significantly on individual nutrition status. Additional qualitative studies are needed. Individual dietary intake surveys may have large margins of error in reporting and/or weighing.
Morbidity	Incidence, point or period prevalence rates for specific diseases (acute respiratory infections, diarrhea, measles, malaria) Infant mortality rate Child mortality rate Crude death rate Maternal mortality rate	Surveys (DHS) Questionnaires Clinic and hospital data	Clinic records Hospital admissions Qualitative surveys on relative frequency, as above.	Recall only good for two weeks. Institution-based data biased.

Determinant	Measurement/indicator	Sources of data	Short-cut method	Comments
Caring Practices	Female literacy rate Occupation/employment of mothers Prevalence of exclusive breastfeeding Prevalence of breastfeeding initiation Mean duration of breastfeeding % of children at age 6 mo. receiving complementary foods Number of meals/day Age of introduction of complementary feeding	Ethnographic surveys DHS Participant observation studies Participatory rural appraisal (PRA)	Focus group discussions Brief on-site observation Opportunistic qualitative surveys	Self-reported care practices can be biased; triangulate findings from multiple sources and methodologies to increase reliability.
Health services	Inventory existing health and nutrition services Immunization rates Utilization rates (e.g., prenatal, well baby)	Clinic records MOH records Surveys Interviews with MOH personnel	Examine training curriculum and job descriptions Look at availability and quality of equipment, drugs, and counseling materials in random clinics	Quality of services difficult to assess and likely to be biggest problem.
Agriculture services	Number of extension workers/population Food and nutrition services provided Level and mechanism for collaboration with MOH	MOA records survey Interviews with MOA staff	Presence of operating food and nutrition unit in MOA Availability of budget for field visits/frequency of supervision Examine training curriculum, job descriptions	Access to extension services by women and poor farmers needs careful review.
Water supply/sanitation	% hh with access to potable water % hh with access to latrines	Health/clinic records Water Board, local public health agencies Community surveys	Opportunistic qualitative surveys	Water quantity is more important than quality. Ask about dry season availability.

reference standards routinely used to assess the magnitude and severity of a given problem in the country are from the United States National Center for Health Statistics (NCHS) data set (see Tool #2, *Basic Facts: Nuts and Bolts of Nutrition*). Ideally, anthropometric data should be collected on a nationally representative sample. Refer to Appendix 1 for definitions of anthropometric indices and indicator cut-offs for determining severity of malnutrition.

*Biochemical indicators.* Data based on biochemical measurements for large population groups are less available than those based on anthropometric measurements because of the logistical difficulties and health concerns about collection techniques (most frequently blood sampling but also urine and occasionally conjunctival cell sampling for vitamin A). The “gold standard” of nutritional assessment, biochemical indicators reflect subclinical deficiency prior to the onset of physical symptoms. Task managers will generally be most interested in the biochemical indicators of vitamin A, iodine, and iron deficiencies. Refer to Appendix 2 for definitions and cut-offs.

*Clinical indicators.* Clinical examination of individuals yields data on physical signs of deficiencies such as night blindness (vitamin A deficiency) and goiter (iodine deficiency). Appendix 2 includes the classification of functional indicators and cut-offs for determining the presence of a public health problem.

---

*Status check:* Stop at this point in the identification process and consult with country counterparts. Confirm your initial determination of the presence and magnitude of one or more types of malnutrition, the geographical location of the vulnerable groups, and identification of the segments of the population most likely to be suffering from deficiencies. If a problem exists, the next step is to determine the causes.

---

**Task 2. Investigate determinants of malnutrition**

*Food availability.* Food availability should be assessed at the national, regional and local levels by analyzing food balance sheets (available from FAO; see Appendix 5 for contact information). Some of the data necessary for food availability analysis include (Lindert, 1995):

- trends in domestic production;
- trends in food exports, imports, and concessional aid;
- changes in food stocks;
- trends in non-food use (animal feed, seed, milling and processing, and waste); and
- population size.

If food availability is adequate, attention and resources can be focused on other priorities such as ensuring food access and improving food utilization (e.g., through improved feeding behaviors and reduced morbidity). If food availability proves inadequate at any (national, regional, or local) level, policy reforms and programs can concentrate on removing existing impediments to supply (foreign trade/aid policies, input/output pricing policies, resource-ownership policies, collection/storage, distribution policies, rural institutions) and ways to boost supply (rural development schemes and investments in research and technology).

*Food access/consumption.* Constraints to food access are common factors determining household food security. Lack of sufficient incomes or resources (including own-production) may characterize pockets of households or entire communities. Identification of these households and the determinants of food insecurity are important tasks during this stage of project identification.

Survey data can be used to assess the adequacy of household intake by income group/quintile, region, and urban/rural areas. The analysis should identify food consumption patterns in addition to total intake for various groups of the population to determine dietary dependence on particular commodities. To assess household food security, the following household level data are needed (Lindert, 1995):

- household composition, including the number, age, and gender of members, and the location of the household;
- total household expenditure, commonly used as a proxy for income, by expenditure groups/deciles, area, region, etc.;
- total calorie intake by expenditure groups/deciles, area, region;
- consumption of major food products (particularly those items subject to existing food price subsidy policies) in terms of quantity and expenditures, by expenditure groups/deciles, area, region;
- recommended minimum levels of caloric intake.

These data usually come from national statistical units, nutrition agencies, health or agriculture ministries, and other development agencies. Household expenditure surveys are generally most available but can be imprecise in their measurement of household-level consumption patterns. Dietary surveys record food intake (which takes account of food purchases, transfers and consumption of home-grown food) data either for the household as a whole or for individual household members. These surveys are usually done on small, select population groups because of the intensity of time and personnel needed. There are typically large margins of error in reporting and weighing. For instance, 24 hour recall of dietary intake frequently underestimates intake.

*Morbidity.* Infection is a critical factor in nutrition status. Even in conditions of adequate or near adequate food availability, infection may inhibit the absorption of nutrients and reduce appetite. Collect information to answer the following questions:

- What are the most prevalent diseases?
- Who is ill (disaggregate by age, location in the community, socioeconomic status)?
- Are there seasonal patterns?
- What percentage of the population is ill at any given time?
- Is treatment available?

In situations with a high prevalence of diarrheal disease in young children, it may be enough to collect data only on this disease because the link between diarrhea and compromised nutrition status in young children is extremely strong. Data sources include hospital and clinic records, ministry of health statistics, DHS, and other donor surveys.

*Caring practices.* In order to understand the determinants of malnutrition in a specific community, it is necessary to assess the activities of household members related to food beliefs and habits (in particular, infant and young child feeding practices), food taboos, provision of childcare, and the time and resource constraints of the care providers which may influence household food and feeding patterns.

Qualitative research methods will be most productive in answering questions related to caring practices in a household or community. Although time-intensive participant observation techniques may be the most thorough, focus groups and tools used in participatory rural appraisal (e.g., semistructured interviewing and preference ranking) can yield useful data

relatively quickly. Data assessment and analysis can build on existing surveys and the experience of other groups in-country. For example, the Demographic and Health Survey for a country may indicate whether lack of exclusive breastfeeding is a problem on a national level. This would alert the task manager to the need for more in-depth analysis of the situation in the community or region in which the project is located.

Questions to answer include:

- How do households obtain their food? Who purchases food? Who controls household resources spent on food?
- What are the daily activities connected to food collection, production, processing and preparation? Who performs them? How much time does it take each day?
- How many meals do the different household members eat in a day? Variations by season, age, gender?
- How are meals prepared? By whom and when? How do issues of hygiene and sanitation impact on food storage and processing?
- What are the food beliefs and taboos in the household? Variations by age and gender? For example, do mothers believe that children should control their own intake, or do mothers/caregivers adopt an active caregiving role for an anorexic child?
- How and what are infants 0 to 6 months old fed?
- How and what are children 6 to 24 months old fed?
- Who feeds them, how often, and where?

*Health services.* Conduct an analysis of existing health services (facilities, timing of service provision), utilization patterns and proximity to households, types of service providers (e.g., government or private practitioners of Western and indigenous medicine), and fees. Identify which types of health interventions that impact directly on nutrition status are delivered through the existing health care services (e.g., management of diarrheal disease, deworming, and childhood immunization programs). Data sources include the ministry of health, local health facilities, and interviews with beneficiary households.

*Agriculture/food production.* Understanding agricultural production constraints to adequate nutrition in a community is important background information for the development of the intervention strategy, even if a direct response is not feasible under the project per se. Baseline surveys in the community, focused interviews with government extension agents, and statistics from the ministry of agriculture will help to answer questions concerning production (FAO, 1993):

- What proportion of crops produced are subsistence food crops and what proportion are cash crops?
- What proportion of food staples consumed come from open markets or public food distribution?
- What are the constraints to food production (e.g., climate, access to land, water, labor and other inputs, storage, processing and preparation, marketing systems)?
- Is there a hungry season? How do households deal with scarcity?
- What markets or retail stores exist?
- What transportation facilities exist?

- What are the market prices of essential foods (e.g., grains, oil, fruits, vegetables) relative to income (FAO, 1993).

Disaggregate data by expenditure groups/deciles, area and region.

*Water supply/sanitation.* Improved water and sanitation may affect nutrition status in a community through reduced transmission of pathogens. Access to water can affect nutrition status through reduced caloric expenditure and increased time available for alternative activities such as childcare, income generation, and household production of food. Information on existing water supply systems (i.e., source of drinking water) and waste disposal is available from local public health entities, and engineering and water supply boards.

---

*Status check:* Quantitative and qualitative data have been collected and analyzed (or existing analyses have been assessed) to decide on the major causes of malnutrition in the country, region or community of concern. Before deciding on intervention strategies, it is important to assess existing programs working on nutrition issues, evaluate the quality and impact of their programs and identify the strengths and weaknesses of the institutions which will implement the new project or component currently being developed.

---

### ***Task 3. Critically evaluate existing nutrition programs***

Identification of existing programs and institutional capacity for design and delivery of nutrition services serve several purposes. The process of data collection for an inventory of ongoing and planned nutrition programs will highlight gaps that the Bank project might fill, determine interest or willing-

ness on the part of the government to do more, and establish useful links with agencies and individuals working locally on food and nutrition issues.

To create an inventory of existing programs, contacts must be established with a wide range of groups and agencies because of the multisectoral nature of nutrition. These may include ministries of health, education, agriculture, and family welfare, and non-governmental groups such as farmers' associations, women's cooperatives, religious groups and other organizations working on social issues and community development. The private sector (particularly the food industry) may be a partner in food fortification efforts, and it is important to assess its capacity for achieving program objectives as well. Knowledge of other donor involvement in nutrition programs helps to coordinate efforts, capitalize on others' familiarity with regional and local situations, and possibly link up for funding or service delivery of the planned Bank project.

Key questions to answer during this assessment and evaluation exercise include:

- Which vulnerable groups have been targeted?
- How have nutrition services been delivered?
- What was the coverage in a given community or region?
- What types of rations were delivered?
- Was there complementary delivery of health and education services?
- What type of impact evaluation was conducted? What were the results?

Answers to these questions will feed into decisions about which interventions under the project will have the greatest impact on malnutrition condi-

tions in view of nutrition services now being delivered through government or private/NGO systems.

***Task 4. Assess institutional capacity***

Identify institutional strengths and weaknesses, and address these in the preparation of the project. For example, it may be necessary to build extra time and technical support into the project in order to facilitate an institution's strengthening through the experience of project planning, implementation, and evaluation (Greiner, 1989). Knowing the determinants of institutional capacity and analyzing deficiencies will help to define how a project might strengthen it:

- staff numbers and distribution;
- staff expertise and training: in-country/external; pre-service; in-service;
- resources, including time, money, ability to procure inputs as needed, transport and communication, stationery, xerox facilities, secretarial support, computers, etc.;
- managerial support and backup, which can be increased by advocacy, publicity, and political recognition for nutrition;
- PR and media support for the activities to be accomplished;
- clarity of project/work purpose and plans;
- technical back-up and support, for example, from the nutrition unit of a national or foreign university (In the Bangladesh Integrated Nutrition project, staff benefit from technical assistance from UNICEF and from the Institute of Nutrition, University of Mahidol, in neighboring Thailand. Under the Second Family Health project in Zimbabwe, the Nutrition Unit of Uppsala University is paid an annual fee to provide technical advice, library and

literature searches, and other backup as needed by the nutrition unit in Zimbabwe, which suggested this arrangement.);

- the ability to coordinate with other groups, drawing on their resources and expertise. In some situations, simply cataloguing all of the existing nutrition projects and programs and facilitating communication among them can go a long way toward strengthening capacity in the sector. Helping local institutions to strengthen linkages with NGOs, other community groups, and the private sector may be the best focus for a project's institutional development objective in some circumstances. For example, the intensive involvement of NGOs in project execution is one strategy for minimizing the risks due to lack of implementation capacity in Bangladesh.
- resources for operations research to better articulate a comprehensive, coordinated approach to nutrition.

---

*Status check:* The emphasis thus far has been on assessing data needs to answer the questions: is there a malnutrition problem, what are its primary causes, what types of programs and interventions already address these problems, and what types of institutional capacity exist to implement a Bank-supported project? This is obviously an oversimplification of the actual process—generally there are some data available, but they are dated or methodologically flawed; there are institutions with which to work and programs already on the ground, but these also have weaknesses; and finally, generic models for delivery of nutrition services are inadequate for dealing with the unique attributes of each geographically and culturally different nutrition program. Bank nutrition and health projects have dealt with these issues through the inclusion of operations research studies to fill information gaps, implementation of pilot projects, and well-designed monitoring and evaluation components.

---

**Task 5. Identify research needs**

Gaps in information will range from basic questions about the presence and/or extent of a particular nutrition problem to the need to identify the best method for delivering an intervention. It may be necessary to carry out studies early on during the project preparation process to rectify problems with nutrition status data quality and availability. Full-scale nutrition surveillance studies are generally expensive, time-consuming and logistically elaborate. Short-cut methods for getting a good sense of the nutrition situation are suggested in Table 1.

Virtually all projects will need to plan for a baseline survey during the first year of the project to be repeated (at a minimum) at the time of project mid-term evaluation, and in many cases, on an annual basis. This type of survey is usually designed for purposes of project monitoring and evaluation; it assesses the project's implementation achievements, and evaluates the impact of interventions (see section on monitoring and evaluation under Project Preparation).

In more recent projects, policy and operations research (OR) components have been incorporated directly into project design, allowing alternative service delivery strategies to be tested and mid-course changes made as optimal delivery systems are identified. In the Philippines Urban Health and Nutrition project, a \$4 million research and evaluation component included four nutrition research activities. Two different delivery mechanisms for prevention and treatment of protein-energy malnutrition among pregnant women and children (one using volunteer health workers and one implemented by paid community workers) were tested in an effort to identify the most cost-effective option. Another study looked at two issues connected with food supplements: 1) whether or not the planned donor-supplied food supplements (bulgur wheat and peas) were the best, most cost-effective choice, and 2) whether amylase enrichment of food supplements to increase the consumable volume by very young children made sense. The third study looked at alternative methods for reducing iron deficiency ane-

mia among infants and young children. One option was the costly administration of 50 days of iron supplements for infants. The alternative was the less expensive supplementation of pregnant women and education/counseling for increased intake of iron-rich foods by mothers and children. The fourth area of research undertook qualitative studies of women's beliefs and practices regarding infant feeding; this fed back into the design of counseling and education messages concerning improved breastfeeding and weaning practices.

In addition to improving the impact of an individual project, operations research may contribute to more generalizable advances in nutrition knowledge. The Honduras Nutrition and Health project has one of the more extensive infant feeding components in Bank projects to date. Within this portion of the project, an OR study is looking at transmission of HIV through mother's milk. While the results will directly influence the content of nutrition education materials in the project and recommendations to hospital milk banks in Honduras, the value of the research goes well beyond the immediate project context.

**K**ey Question: *Which interventions and strategies will best address the nutrition problem(s) selected for action?*

---

### **Tasks for project preparation**

- Select possible intervention strategies
  - Begin to design the project
  - Plan for the monitoring and evaluation system
  - Initiate economic analysis of intervention options
- 

By this point in the project development cycle, the major nutrition problems to be addressed by the project have been identified. Optimally, this has occurred in conjunction with the community or populations being targeted for receipt of services. Based on the malnutrition problem, a variety of intervention strategies are available for consideration. Program options for the major conditions resulting from poor nutrition status are discussed. This stage of project development also includes planning for the monitoring and evaluation system, the initial work on economic analysis of the project and actual project design.

#### ***Task 1. Select intervention strategies***

Most Bank-supported nutrition projects build on existing programs and use existing institutions to deliver services. Table 2 lists multiple options for addressing particular conditions and causes of malnutrition, but it will be unlikely that a project or component will implement all of them. For example, in

**Table 2: Program Options for Addressing Malnutrition**

Indicator of compromised nutrition status	Intervention options
Low birth weight	Prenatal nutrition services: counseling on dietary intake, reduced caloric expenditure weight gain monitoring iron folate supplementation deworming Targeted supplementary feeding to pregnant/lactating women, adolescent girls
Child malnutrition and growth failure	Communication for infant/child feeding behavior change (e.g., breastfeeding promotion, weaning foods) Growth promotion: growth monitoring and counseling Targeted supplementary feeding Infectious disease control Curative nutrition rehabilitation
Micronutrient malnutrition	Fortification of foods with micronutrients Micronutrient supplementation Dietary change: education/communication/counseling Policy change
Household food insecurity	Food policy (i.e., explicit consumer food policy, agricultural, trade, and macroeconomic policy) reform Actions for household food security (e.g., labor saving devices for women, on/off-farm income generation skills) Safety nets, including targeted income transfers (e.g., targeted food subsidies, food stamps) Income generation activities (e.g., micro-credit programs, farm inputs packages, skills training) combined with nutrition education
Poor health/nutrition among school-age children	Deworming Micronutrient supplementation School feeding programs (breakfast/snacks) Nutrition communication

a region where low birth weight prevalence rates indicate a serious problem of maternal undernutrition, current government health services may deliver inadequate or no counseling/nutrition education for increased caloric intake/decreased caloric expenditure for pregnant women. The Bank-supported project might focus on this gap to improve the quality and impact of the existing program. In another scenario, pockets of severe household food insecurity have been identified. Preferably, a project would provide short-term relief of the dangerous situation through targeted income transfers and also develop income generation activities, but institutional capacity constraints may dictate that the project focuses on the latter or develop a partnership with NGOs to work on the long-term strategy to raise incomes.

***Objective: Decrease the incidence of low birth weight***

Low birth weight infants (babies born at full term weighing less than 2500 g or 5 lb 5 oz) are at severe risk of malnutrition and growth failure and are more likely to die. Of the several causes of low birth weight—including young age of the mother, malaria, congenital abnormalities or infections, and tobacco and alcohol use by the mother—maternal malnutrition (protein-energy and iron deficiency) is the most critical determinant.

Well nourished women gain, on average, 10 kg (22 lb) during pregnancy. During the first six months of pregnancy, most of the additional calories consumed build up maternal tissues and fat deposits, with only a small amount actually needed by the developing fetus. Low nutrient intake and high caloric expenditure will impact most negatively on maternal nutrition status at this stage of pregnancy, raising the chances for maternal depletion syndrome (persistent and increasingly severe malnutrition with subsequent pregnancies) to develop. In contrast, the last trimester's weight gain is critical for the growing baby and its own stores of fat, iron, and vitamin A, making insufficient nutrient intake at this time particularly problematic for the baby's well being. In sum, malnutrition during pregnancy compromises the health of both mother and baby.

***Intervention: Prenatal care***

*Counseling and nutrition education* efforts are central to the process of achieving incremental behavior change. Communication techniques range from face-to-face dialogue with mothers to traditional and mass communications media. Effective messages are based on careful research, and extensive discussions and trials with intended target audiences in the community. Information on raised calorie needs, increasing diversity of foods in the diet, protein and micronutrient requirements and reduced workloads may need to be communicated. A communications strategy must also consider how to capture the attention of husbands, parents-in-law, and extended family members. Guidelines for developing counseling and nutrition education messages are found in Tool #8, *Using Communication to Improve Nutrition*.

*Monitoring weight gain.* Optimally, a woman's weight gain will be monitored at each antenatal visit. Growth monitoring should be accompanied by counseling (described above).

Frequently, concerns about large babies precipitating difficult births underlies "eating down" during the last trimester, when women deliberately reduce their food intake. Women, and those in the community whose advice they respect, need to be convinced that this practice is dangerous for the mother and her baby, and unlikely to ease the birth process. Women who are short (less than 151 cm) were most likely stunted in childhood, and are at risk of a difficult childbirth no matter what the birth weight of the child. Similarly, pelvic deformities due to childhood vitamin D deficiency will predispose to difficult deliveries. These women will need supervised and possibly assisted deliveries in any case (King and Burgess, 1993). Adequate nutrition is crucial for every mother and child to ensure the health and productivity of the woman, survival and optimal development of the child and (in the case of a girl child), the prevention of continued cycles of undernourished women having low birth weight children.

*Iron folate supplementation.* Preventing and treating iron deficiency anemia through distribution of iron folate supplements is important for both maternal and child well-being. Severely anemic women are at greater risk of death due to hemorrhage during childbirth and may account for one-fifth of maternal deaths. In addition, there is evidence that anemic infants have higher mortality rates as well as a greater chance of low birth weight (Levin et al., 1993). Pregnancy places women at particular risk of iron deficiency anemia as they manufacture increased numbers of red blood cells to support the developing fetus. Iron is also transferred to the fetus to build up its stores at the expense of the mother's. Folate requirements similarly rise during pregnancy. In most developing countries, where a high percentage of non-pregnant women are anemic, individual screening for anemia is unnecessary.

Although iron folate supplementation appears to be a simple intervention, the delivery logistics and volume of supplements needed to maintain an adequate supply of daily iron folate tablets for women in a community can be complicated and difficult to sustain. Women may sometimes be reluctant to continue with the daily regimen due to side-effects, especially over the 4-5 months (i.e., the second half of the pregnancy) recommended for preventive treatment.

*Treat parasitic diseases.* Parasitic diseases in pregnant women contribute to deficiency conditions: malaria exacerbates folate needs, and parasitic infections such as hookworm, schistosomiasis, and whipworm increase iron loss. Treating pregnant women with parasitic diseases improves nutrition as part of good overall prenatal health care.

***Intervention: Supplementary feeding***

Depending on the specific situation, community priorities, external and local resources, and institutional capacity, supplementary feeding may be an option to consider (see general implementation guidelines, Box 1). The Bank position on financing of food supplements is under discussion; a policy decision and operational guidelines are expected by the end of FY96. In the

### Box 1: Feeding Programs

**F**ood programs in Bank projects generally deliver rations to vulnerable or at-risk groups, provide institutional feeding in schools or implement food-for-work (FFW) programs. Rations can be delivered as “take-home” food or prepared at a central location for on-site feeding. Several rules of thumb apply to most feeding programs:

- use clear exit/entry criteria;
- food is accompanied by counseling and referral;
- target food to children based on growth faltering;
- rations should contain approximately 55% of children’s and 30% of women’s daily energy needs;
- general guidelines are: 8–12% of ration calories from protein, 20–25% from fat (King and Burgess, 1993);
- the best food for rations is local (not imported from international donors) food;
- preparing on-site rations as “snacks” minimizes substitution problems;
- establish linkages with the health services delivery system;
- plan for adequate funding of non-food costs;
- feed school children early in the day for maximal impact on attention;
- identify the least cost option for achieving sufficient nutritional impact—involve the community (e.g., the parent teacher association) in provision and delivery of food;
- in public works projects, insure that beneficiaries are the most vulnerable population groups;
- and deliver iron supplements and deworming medication to enhance FFW participants’ productivity.

past (prior to the establishment of formal policy) food delivered by projects was generally financed by other donors, World Food Program and governments. One type of exception was for targeted programs such as the Tamil Nadu Integrated Nutrition project in which food supplements were treated like pharmaceuticals and distributed using rigid program entry and exit criteria.

Supplementary feeding is one of the most expensive interventions on a cost per participant basis, but with careful selection criteria, it can be an effective tool in combating low birth weight, reducing infant mortality rates, and improving women's nutrition status. Detailed recommendations can be found in Tool #5, *Food Supplementation for Women and Young Children*. Among the risk factors to consider for targeting are maternal height less than 147–153 centimeters, maternal weight of 40–53 kilos before pregnancy or weight gain of only one kilo by the 20th week (WHO, 1995). Targeting non-pregnant adolescent girls as well as pregnant women may establish improved nutrition status prior to the start of debilitating reproductive cycling and poor birth outcomes.

If program resources permit, expand the target population to lactating women. While studies are not consistent in their findings regarding the impact of food supplements on breastmilk quality and quantity, supplements do assist the mother in replenishing nutrient stores which are critical to her productivity and will prepare her for subsequent healthy pregnancies and sufficient breastmilk supplies. A moderately undernourished woman—un-supplemented—can produce an adequate amount of breastmilk for her baby provided frequent suckling is encouraged. A severely malnourished woman may produce 20–30 % less breastmilk than her well-nourished counterpart and her child is more likely to need supplementary food at four months of age (versus the six months of exclusive breastfeeding that a well-nourished woman can often sustain) (King and Burgess, 1993). This exposes the infant to the risk of infection from feeding utensils at a younger age, and decreases the child spacing effect of lactational amenorrhea. The first priority is to *begin* each pregnancy well-nourished and to have an ade-

quate diet during each pregnancy. Supplementing nutritionally at-risk lactating women will contribute to this objective.

***Objective: Reduce child malnutrition and growth failure***

A recent study (Pelletier et al., 1995) suggests that 56% of child deaths are attributable to malnutrition, of which 83 percent were due to mild-to-moderate malnutrition. Another study demonstrates that 36% of the burden of disease of children under 5 years of age is due to malnutrition (WHO, December 1995).

***Intervention: Communication and nutrition education***

As is the case with virtually every intervention described in these guidelines, effective communication strategies to moderate household nutrition behavior are key to long lasting improvements in child growth. In order to avoid relapse into growth failure, supplementary feeding programs must have a well-developed and well-delivered education component. Infectious and parasitic disease treatment protocols must also include an emphasis on effective communication techniques for needed adjustments in caregiver behavior for feeding of sick and recovering children and actions to prevent recurrence of disease.

Social marketing is most often associated with communication of nutrition messages, but it has been used successfully with many different types of interventions in nutrition projects. It is a comprehensive strategy to change key behaviors of policymakers, service providers, and family members. It includes mass media, print media, face-to-face counseling and traditional communications media. "A complete social marketing strategy not only develops and promotes a good 'product' but also achieves and maintains political support and trains and motivates program implementors (Favin and Griffiths, 1992)." To be successful, the social marketing process must involve the beneficiaries in formulating and testing products, devising pro-

## Box 2: Nutrition Communication

Refer to Tool #8, *Using Communication to Improve Nutrition* for in-depth treatment of project preparation and design issues for this critical component of every nutrition program.

The basics:

- messages are based on research in and with target audiences;
- messages are given first as trials, then are negotiated through an iterative process with target groups;
- the media and frequency of messages are tailored to key audience segments;
- the media selected for dissemination are appropriate to the message and audience;
- messages are designed to call for action, resolve resistance to change, offer meaningful benefits and be memorable;
- after initial project launch there is regular monitoring, evaluation, and refinement of nutrition communication messages.

gram strategies and activities, and identifying specific messages for communication materials (see Box 2).

*Social Marketing of Micronutrients in Developing Countries* by Michael Favin and Marcia Griffiths of The Manoff Group (available from the nutrition group in the Human Development Department) presents several excellent exam-

ples of social marketing concepts applied to problems of micronutrient malnutrition.

***Intervention: Counseling and growth promotion***

Nutrition counseling targeted through growth monitoring for the promotion of child growth is a cornerstone of any effort to reduce and prevent child malnutrition. A child's growth is monitored (through weighing and charting of weight monthly from birth through the first two-three years of life) and decision-making about suggested actions is based on the adequacy of weight gain or velocity of growth between visits. Counseling tailored to the mother or other caregiver client is critical, with follow-up and feedback on the effects of actions taken. Costs may be reduced—and perhaps effectiveness improved—by using selected, well-trained peers as counselors (for example, in Zimbabwe, Tamil Nadu, and Bangladesh). Growth promotion is best done at the community level (not through a clinic) and separate from food distribution (this tends to become the focus of the program). See Tool #4, *Promoting the Growth of Children: What Works* for more detailed information and program guidelines.

Actions flowing from the growth monitoring process include: nutrition counseling on feeding and child care practices (e.g., need for exclusive breastfeeding for the first six months, advice on frequent, small, calorically-dense meals in addition to breastmilk for children ages 6 to 24 months), referral to community-based support programs such as child care, micro-credit, and agriculture extension services to address underlying determinants of poor growth (e.g., inadequate child care, poverty, constraints to agricultural production), medical referral, and targeted supplementary feeding.

Early childhood development (ECD) programs provide another route for enhancing the growth and development of preschool age children. These are integrated programs, targeted to children six-years-old and younger, which provide a range of health, nutrition, and education services. Within ECD programs, nutrition interventions can take the form of direct provision of meals

and micronutrient supplements, nutrition education and counseling for day care providers and parents, treatment of parasites and diarrhea, provision of clean drinking water, and medical referral. Refer to Tool #7, *Nutrition in Early Childhood Development Programs* for more information.

***Intervention: Supplementary feeding***

Supplementary feeding programs, as suggested above, are relatively expensive and difficult to sustain in the long term. However, there are several examples of tightly targeted feeding programs (e.g., Tamil Nadu Integrated Nutrition Program, Children's Supplementary Feeding Program in Zimbabwe) which have achieved improvements in child nutrition status. Children with the greatest weight deficit show the greatest response to feeding programs. On-site feeding yields the largest increase in food intake by the intended beneficiary, but can be up to 60 percent more costly than take-home ration programs. However, on-site programs provide an opportunity for nutrition education and psychosocial stimulation of the children. Take-home programs generally have a larger geographic outreach, better coverage of children under two years of age, are more convenient for mothers than a daily attendance requirement, provide higher coverage per health center, and require fewer staff. On-site feeding may be substituted for home portions of a child's diet and take-home rations may be diverted to unintended groups. Attributes of successful programs include use of local foods, community participation in food preparation and distribution, "customized" nutrition education messages, and high quality management with adequate numbers of staff, low supervisor/staff ratios, and frequent, field-based in-service training.

***Intervention: Prevention/treatment of disease***

Prevention and treatment of parasitic and infectious diseases are important components of the strategy to address child malnutrition. In addition to decreased absorption and increased loss of nutrients from the gut, worm infections and diarrhea can decrease children's appetites. Infections increase

nutrient requirements at the same time that a child's intake decreases due to the side effects of the disease: fever raises calorie needs, a child with measles needs more vitamin A and malaria raises the body's folate requirements. The negative synergism between malnutrition and infection can quickly escalate into severe malnutrition requiring expensive (and often unsuccessful) curative nutrition rehabilitation.

***Intervention: Curative nutrition rehabilitation***

Interventions to address the most severe cases of malnutrition (i.e., kwashiorkor and marasmus) include referral to medical care for concurrent infections and therapeutic feeding combined with education. These children—exhibiting growth failure and often critically ill—are usually hospitalized or admitted to a nutrition rehabilitation center (NRC) for an extended period during which time they receive graduated feeds to recover appetite and stabilize their nutrition status. A child may initially require hospitalization for treatment of underlying pathologies, and then transfer to the NRC for the three to four months needed for recuperation and caregiver training to prevent relapse. Home management may be an option in cases of moderately severe protein-energy malnutrition, and a recovering child may be moved to the home during recuperation. Particularly in NRCs, there is a strong emphasis on nutrition education of the mother/caregiver. Local foods are used and the home living conditions are simulated in order to communicate sustainable feeding habits (Berg et al., 1986).

Relative to the expense of hospital confinement, NRCs are cost-effective. However, this intervention makes sense only in regions or communities with a significant clustering of severe malnutrition because the overall costs of the intervention are high compared to most preventive activities and recidivism among participants is common. The task manager needs to understand the current magnitude and management of severe malnutrition (particularly wasting), and then determine whether centers can be located so as to provide economical patient loads and care for the bulk of the severely malnourished (Berg et al., 1986).

The NRC should be viewed as a transitional intervention, since effective preventive nutrition services should eliminate any necessity for them in the long-term. The need for nutrition rehabilitation is a symptom of failure of nutrition programs to prevent malnutrition. While physicians should know how to treat cases of severe malnutrition, mounting public health programs to treat them should not be necessary.

***Objective: Decrease micronutrient malnutrition***

Three intervention strategies—fortification, supplementation, and dietary change—can be used to prevent and treat the three most common and debilitating micronutrient deficiencies: vitamin A, iodine and iron. A long-term strategy involving phased interventions is optimal. While it may be necessary to focus on immediate supplementation of micronutrients, the long range plan can include promoting food sources of micronutrients, developing plans for fortification of a staple food source where feasible, and promoting consumption of micronutrient-rich foods (McGuire, 1994). Refer to Appendix 3 for supplement dosages; see Table 3 for program options for micronutrient deficiencies and *Enriching Lives: Overcoming Vitamin and Mineral Malnutrition in Developing Countries* by J. McGuire (1994) for further discussion of the following interventions.

***Intervention: Fortification***

In many contexts, fortification of the food supply is likely to be the most cost-effective measure to address the problem in a whole population. Successful fortification demands involvement and cooperation of the food industry, consumer awareness and demand for the fortified product, and functioning regulatory frameworks including an efficient and motivated staff for monitoring and quality control activities (Box 3 details lessons learned).

**Table 3: Decision Matrix and Program Options for Iron, Iodine, and Vitamin A Deficiencies**

Deficiencies	Supplementation	Fortification	Dietary Change
Vitamin A	Likely to be needed in short term where prevalence is high. Medical targeting and delivery through EPI desirable.	Not likely to be needed except for refugees, or where climate and/or dietary traditions exclude major vitamin A food sources from the diet. May be desirable where the ideal food vehicle exists.	Likely to be needed in most deficient countries. Start simultaneously with supplementation. Support, if necessary, with agricultural extension and inputs.
Iodine	Likely to be needed in the short term wherever cretinism exists. In the long term, it may be required in isolated geographical areas where the salt industry is traditional and commercial markets are poorly developed.	Likely to be needed in all deficient countries. May not be immediate solution where the salt industry is dispersed and artisanal.	Unlikely to be of use except over the very long-term (until the diet derives from distant, iodine replete soils, and from certain seafoods).
Iron	Likely to be needed in the short- and long-term for pregnant women and possibly young children.	Likely to be needed in most countries. Research and development probably needed. Weaning foods need iron fortification.	Most promising where meat is consumed widely and where iron cooking pots used. Agricultural extension to promote livestock production, legumes, and vitamin C foods needed.

(McGuire, 1994)

### Box 3: Lessons of Experience: Fortification

- consumer education and demand creation are essential,
- the need for careful selection of the staple food to be fortified based on retention of color, flavor, texture, and cooking properties after fortification, and confirmation of easy, inexpensive fortification during feasibility studies,
- fortification sites must be easily monitored,
- universal, mandatory fortification is necessary,
- duties and fees on imported fortificants should be waived,
- quality control staff must be adequate in numbers and motivated to do an honest and thorough job,
- producers must receive incentives such as technical assistance and subsidies for small manufacturers, with swift but not overly punitive sanctions for offenders. (McGuire, 1994)

#### *Intervention: Supplementation*

In the short-term, and for certain vitamins and minerals (such as iron and folate for pregnant women) on a more or less permanent basis, supplementation of the diet with pharmaceutical nutrients in capsule, tablet, injectable, or liquid form is necessary. Supplementation programs demand a good logistical system with adequate amounts of high-quality pharmaceuticals and a good social marketing program to sensitize and inform the target population about micronutrients (see Box 4).

#### Box 4: Lessons of Experience: Supplementation

- target groups for prioritized treatment (e.g., universal targeting of iodized oil to all women of reproductive age or vitamin A to all preschool children, medical targeting of vitamin A to children with measles, chronic diarrhea, and severe respiratory infections, geographic targeting of iron to regions with high prevalence of malaria or hookworm),
- use existing outreach programs such as the Expanded Program on Immunization to increase coverage,
- insure the capable, informed delivery of supplements by health workers,
- schedule regular weeks or months for supplements to ease management and marketing problems,
- counsel household decision-makers about giving micronutrient-rich foods to young children and pregnant and lactating women (including breastfeeding promotion). (McGuire, 1994)

In communities with endemic iodine deficiency and little or no available iodized salt, providing iodized oil to women of reproductive age is a highly cost-effective intervention for preventing irreversible mental retardation as well as less severe manifestations of iodine deficiency. Two oral iodized oil capsules cost \$0.36 and need only be administered once every two years. It is best to supplement women before conception (it is critical that the mother is iodine replete during the first trimester when fetal brain development occurs), but it is safe to treat during pregnancy.

Vitamin A is most effectively delivered to the newborn through breastmilk, provided the mother is consuming adequate amounts of the micronutrient in her diet. Generally, a low birth weight infant is born with low stores of vitamin A, and the mother is likely to be deficient herself. Supplementing the mother with one 200,000 IU vitamin A capsule is recommended within the first four to eight weeks *after* delivery. The capsules cost only \$0.02. It is important not to administer the supplement either during pregnancy or when a woman is at risk of pregnancy—consuming high doses of vitamin A is linked to fetal abnormalities.

***Intervention: Dietary change***

Consumers can improve the quality of their diets (often without increased expenditure) through dietary change if they are supported by well-designed communications programs and have access to micronutrient-rich foods that are affordable and acceptable. Nutrition messages are most effective when they reach consumers through many channels, including the mass media reinforced by personal contacts at schools, the workplace, and health clinics (McGuire, 1994).

In many countries, the availability of fruits and vegetables is highly seasonal. Community, school, and household gardening activities can improve year-round availability of micronutrient-rich foods. In addition, food preservation and storage technologies can also be used to extend the availability of some foods such as mangos, papayas, spinach, and other green leafy vegetables.

***Intervention: Policy change***

It is often also necessary to bring about changes in food policy to achieve long-term nutritional improvements. Several aspects are of particular importance for nutrition. Encourage subsistence agriculture including increased diversity and productivity of home gardens. Food policies should focus on dietary quality and the possibilities for improving the micronutrient content

of grains through selective breeding, seed treatment, and mineral fertilization. Protection of areas where communities gather edible wild plants will preserve traditional sources of micronutrients in diets. And public policy can help create more marketing outlets, improve water systems and roads and storage facilities that will reduce farm-to-market spoilage, and advance food preservation techniques. Particularly in the case of vitamin A, food preservation is critical to smoothing out seasonal fluctuations in the availability of vitamin A-rich foods (McGuire, 1994).

***Objective: Reduce poverty and household food insecurity***

In populations characterized by poverty and household food insecurity, low purchasing power and lack of access to food are critical determinants of malnutrition. Reform of trade, macroeconomic, and agricultural policies affecting prices and access to resources to purchased food and food availability as well as targeted safety net programs may be appropriate mechanisms for addressing the problems of poverty-related malnutrition. Refer to Tool #11 *Food and Nutrition Policy* and Tool #6 *Food Stamps and Related Nutritional Safety Nets* for more thorough discussions of the topics.

***Intervention: Food policy reform***

Food policy encompasses the broad spectrum of macroeconomic, trade, and agricultural policies which affect food consumption via prices and incomes. It also includes explicit consumer food policies such as food price subsidies, food rations or food stamps. Food policy reform involves efforts to reduce distortions against food consumption or in favor of over-consumption (for example, of specific foods such as meat) and to improve the targeting of explicit consumer food policies to facilitate access to food by nutritionally at-risk individuals. Key to policy reform is an awareness of the potential impact of changes in various macroeconomic, trade, and agricultural policies on food consumption and nutrition; for example, the effect of changes in agricultural tariffs on the food security of the poor.

The process of food policy reform is often politically sensitive and requires particular attention. These issues are dealt with in greater depth in the food and nutrition policy tool.

***Intervention: Actions for household food security***

Household food security is generally defined as access by all individuals at all times to enough food for an active and healthy life. Over the long-term, increasing capacity for income-generation, including education and technological change to strengthen labor productivity will contribute to improved household food security. Interventions include improving the productivity of small-scale agriculture, income-generation projects for both on- and off-farm activities, credit programs (make accessible to marginalized groups such as women farmers), and public investment in infrastructure.

While these food security interventions are most apt to be incorporated in agriculture projects, several nutrition and health projects have included some in their design. The PHN Sector Credit in Malawi works with women to increase income-generation options through the introduction of labor-saving devices (which also decrease their caloric expenditure) as well as providing packages of agricultural inputs and food for the lowest-income women. These packages allow households to cultivate their own land, increase agricultural yields, address pre-harvest food shortages and help overworked mothers with little time or resources to protect the nutrition status of their children.

In Lesotho, under the Second PHN project, targeted credit allows food-deficit households to purchase diesel-powered mills for village-based grain processing through women's groups. Local NGOs provide the groups with training for managerial and technical skills.

***Intervention: Safety nets***

In the short- and medium-term, safety net programs may be necessary for households negatively affected by adjustment operations and to cushion the impact of fluctuations in food prices and availability. Targeted food subsidies and other income-transfer mechanisms such as food stamps and coupons can help alleviate immediate household food insecurity. Where food is available and the retail system is commercialized, coupon systems are preferable to food distribution schemes because of their lower administrative costs and minimal infrastructure demands.

Public-works programs (food/cash-for-work) have also been successful in reducing food insecurity in the short-term. Frequently such programs are self-targeted to the poor because of lower wages and less desirable work. Care must be taken to assure adequate provision of complementary inputs for public-works programs (e.g., cement, seedlings, gravel) and to target the capital produced to the needs of the poor (rural access roads, for example).

***Intervention: Income-generation programs combined with nutrition education***

Several recent Bank health and food security projects have linked interventions designed to increase incomes (for example, micro-credit programs and training for financial management and cottage industry skills) with education programs to encourage adoption of positive nutrition behaviors. The combination of raised incomes and the knowledge to effectively channel the additional household resources into improved nutrition produces a greater impact than if each intervention was delivered in isolation from the other (MkNelly and Dunford, 1996). The positive synergy of the combined micro-credit/nutrition education model has a particularly strong impact on the household when women are targeted for receipt of program services.

The incremental costs of the combined program can be minimal. Freedom from Hunger, a US-based NGO, has been able to demonstrate through its

“Credit with Education” version of village banking, that with tight integration of the education services into its credit service delivery mechanism, the education component can be delivered with almost no additional cost at the level of the village bank (MkNelly and Dunford, 1996).

***Objective: Improve educability of school-age children.***

Poor school achievement, repetition of grades, and dropping out may all be symptoms of poor nutrition status. Iodine deficiency disorders (IDD) place children at risk for reduced IQ and impaired hearing, while anemia is correlated with poor attention spans and poor performance on tests. Iron and vitamin A deficiency reduce resistance to infection and impact negatively on attendance. Protein-energy malnutrition and short-term hunger impair learning capacity and the ability to pay attention and concentrate on school tasks. The heavy parasite loads common in this age group contribute to malnutrition through decreased appetite, poor absorption of vitamin A (roundworms) and iron loss due to hookworm infection, contributing indirectly to poor school performance. This section draws heavily from the January 1996 World Bank draft, *From Surviving to Thriving: Meeting the Nutrition and Health Needs of School-Age Children in Africa and Other Developing Regions* by J. Del Rosso and T. Marek.

***Intervention: Deworming***

Mass application of anthelmintics (deworming) drugs through the schools is an inexpensive and relatively simple program to deliver. Depending on the worm species and drug selected for control, a single treatment may be sufficient for the year. Costs range from US\$.03 to US\$.52 per dose. In areas where surveys indicate helminth infections at prevalences of 50 percent or higher in school-age children, mass treatment without screening is recommended. Refer to Tool # 9 *Nutrition for School-Age Children* for more detailed guidelines on deworming and the other interventions discussed here.

***Intervention: Micronutrient supplementation***

Iodized oil capsules delivered once a year can alleviate iodine deficiency in children ages 6 to 15. A daily supplement of 30–60 mg iron for two weeks to three months and a 200,000 IU (international units) capsule of vitamin A every four to six months meet a child's requirements. The supplements themselves are inexpensive. Costs (exclusive of shipping, handling and local delivery charges) are about US\$.02 per dose of vitamin A, US\$.10 per child for 40 iron supplements, and US\$.36 per 400 mg iodine capsule. By incorporating supplements into ongoing school health or feeding programs, actual delivery may add only minor incremental costs.

***Intervention: School feeding***

Historically, school feeding programs are a common intervention. Often highly politicized, they are notoriously under-evaluated and there is little known about program impact or actual costs. As discussed earlier, food supplementation is often an expensive activity, even when programs take advantage of donated food resources. Sustainability of school feeding programs is doubtful. Refer to Box 2 (Feeding programs) for general advice on program design in order to maximize the positive impact of school feeding on hunger, malnutrition, and school performance.

***Intervention: Nutrition communication***

As with each of the interventions discussed earlier, an information, education and communication component (IEC), oriented toward promotion or change of specific nutrition practices is central to sustaining the benefits of short- to medium-term actions such as deworming and supplementation. Social marketing approaches are commonly employed for nutrition education (see page 30, *Reduce child malnutrition and growth failure*). The Child-to-Child model has also been used in many African countries for health education. This uses children as a non-traditional channel of information to home and community. (Publications by The Child-to-Child Trust are available through TALC, referenced in Appendix 5.)

---

*Status check:* Come to closure on the basic elements of the project: what are the objectives of the project, what mix of strategies will be used to achieve the objectives, what are the planned inputs and expected outputs? The process of project design—including careful planning for the monitoring and evaluation system—will logically flow from these discussions.

---

### ***Task 2. Begin to design the project***

Limiting the number of components or interventions within a single component and simplifying administration are key lessons from earlier nutrition projects. No single project or project component can address all of the factors affecting nutrition status in a country or region. Actions should be focused on the most critical needs. That being said, it is also critical that nutrition projects/components be viewed as part of a larger strategy of development actions affecting nutrition. These cut across multiple sectors within the Bank and in individual government bureaucracies. Open communication among Bank country team members and between sectors is needed to promote synergy between Bank-supported projects and components in all sectors that affect nutrition status.

Rational project design flows from the selection of priority interventions in consultation with the community in order to further tilt the odds in favor of long-term, sustainable change in nutrition status. Base decisions on the results of tasks accomplished during project identification and preparation phases. Institutional capacity at all levels for management of the project, local capacity for service delivery, human and financial resource availability, the national policy environment, and options for linkages with NGOs and other community groups have been assessed and factored into design decisions.

### ***Institutions***

- Work with institutions that are already in place. “The use of an existing infrastructure, even an imperfect one, as the operational entity is preferable to creating a new one (Marek and Heyward, 1994).” Projects are easier and quicker to implement and may be more likely to succeed and survive over time.
- Countries with some of the more effective nutrition programs have had two distinct institutional structures. One is in a centralized institution (often in the ministry of the interior, planning or finance) responsible for research, advocacy, planning and monitoring. The operational entity is usually in the ministry of health with a separate implementation budget for programs.

### ***Design strategy***

- A design incorporating interventions for both short- and long-term impact is most effective. Long-term, sustainable nutrition change will come from activities such as income-generation programs, food fortification, and education for behavior change. Projects should also address the immediate nutrition needs of at-risk groups through interventions such as micronutrient supplementation, income transfers and targeted feeding. The Senegal Community Nutrition and Madagascar Food Security and Nutrition projects are examples of this approach.

### ***Targeting***

- Rationally target program services and inputs to benefit the greatest number of at-risk individuals or households; balance achieving high specificity against the administrative cost of targeting (refer to Task 3 under Project Appraisal for targeting strategies).

***Workers/work routines***

(Heaver, 1991)

- Determine reasonable worker-client ratios (in Bangladesh, 1 per 1–1500 population) and supervisor-worker ratios (1:10–1:15).
- Begin design of the work program at the level of the most peripheral worker; define a narrow range of field worker tasks to insure a manageable workload and map out time per week to accomplish each task.
- Next, move up the administrative chain to determine (for all levels of worker): training needs, supervision frequency and type, logistical support (supplies, counseling materials, etc.), information needs/requirements (which data are collected, analyzed and communicated), and coordination with others (how medical referral is handled, etc.).
- Define work routines with clear prioritization of clients. Emphasize the need to seek out women rather than wait for them to appear at a clinic or nutrition center.
- Support staff through in-service training and high-quality, frequent supervisory visits that emphasize positive job performance assessments and on-site learning by example.
- Recruit workers from the local community using strict eligibility criteria (e.g., in the Bangladesh Integrated Nutrition project, community nutrition promoters are preferably poor women who have successfully raised well-nourished children, and therefore possess positive maternal/child care skills even before training, pass simple competency and aptitude tests and are willing to serve the whole community, including the poorest and most remote areas).

### ***Community participation***

- Involve clients in the project's early design and development, in the implementation process as volunteers or paid workers, and as decisionmakers throughout the life of the project.
- Display program performance information in the community.

### ***Management information system***

- Design a responsive management information system with quick feedback to project staff and the community for detection of poor program performance and adjustment of implementation procedures.

### ***Partnerships***

- Collaborate with donors to capitalize on other agencies' strengths. For example, UNICEF field offices frequently offer in-depth knowledge of the local nutrition and health situation and have developed extensive networks among the various agencies and individuals working on nutrition. The task manager of the Madagascar Food Security and Nutrition project credits project success in part to close collaboration with UNICEF, the International Labor Office and the World Food Program. UNICEF is the executing agency for the iodine deficiency disorders control program, WFP provides the food for the Food-For-Work program and the ILO oversees that component's operation.

### ***Project scale/duration***

- Control the speed and scale of project expansion. In Indonesia, the Second Nutrition and Community Health project suffered from overly rapid project expansion. The quality of health worker training and service deteriorated and beneficiary participation in formulation of project goals and identification of intervention plans was sacrificed.

- To achieve demonstrable improvement in the nutrition status of large population groups, plan for project duration of five or six years.

---

*Status check:* Project design is in process. Concurrent planning for the monitoring and evaluation system and project economic analysis will also occur during the preparation stage of the project cycle.

---

### **Task 3. Plan for the monitoring and evaluation system**

“Monitoring and evaluation (M/E)...is a normal part of daily life, whether personal or professional. It is generally a matter of common sense: if something does not turn out as expected, a person tries to understand why and then either modifies the activities or redefines the objectives (FAO, 1993).”

Assessed as weak in many past Bank projects, a M/E system is a practical management tool to 1) inform managers whether or not the program has been implemented as planned (monitoring inputs and outputs) and 2) to evaluate the impact of interventions and the achievement of program objectives and enable the project design to be improved during implementation and in subsequent projects. Monitoring and evaluation is also an essential aspect of within-project supervision.

For nutrition projects it is especially important to take monitoring and evaluation seriously. Service delivery and program implementation issues—not research on which nutrients are missing from diets—remain the major stumbling blocks to making a dent in global malnutrition. And while there are some broadly applicable lessons of experience to inform program design, each component or project is essentially breaking new ground because of the multiplicity of political, cultural, and geographical variables unique to every setting. The same may be said for a rural infrastructure pro-

ject, but two factors predispose the nutrition sector to extreme “site-specificity”: 1) the fact that changing human behavior is often a central objective of nutrition programs and 2) the multi-causal nature of malnutrition.

*Participation.* Designing and implementing the M/E system are key activities for involvement of the community. Participation by beneficiaries strengthens their capacity to assess and prioritize their community’s nutrition problems, identify causes, and plan for solutions. The M/E system, established early in the project development cycle, serves as a catalyst for community action. Prompt and continuous feedback from the project to the community—along with mid-term changes to the project—will ensure the relevance of the interventions.

*Potential value of monitoring and evaluation.* Typically, the monitoring and evaluation process provides information on the delivery of project services and the achievement of program development objectives. In M. Valadez and M. Bamberger’s volume (1994), *Monitoring and Evaluating Social Programs in Developing Countries*, they suggest that well-conceived M/E systems can assist policy makers, planners and managers in four ways: 1) to improve a country’s selection of development projects by ensuring activities that will likely succeed and will meet country objectives in the most cost-effective way, 2) to determine whether projects are responsive to beneficiary concerns and detect and correct problems, 3) to measure whether projects are achieving social and economic objectives, and 4) to assess the impact of projects on wider development objects such as poverty alleviation and improving women’s status.

*Types of indicators.* Some projects such as the Philippines Urban Health and Nutrition project (UHN) refine M/E categories to include indicators of project *performance* in addition to *process* and *impact*—generally, most projects subsume the categories of performance and process under a single label, “process”. Project performance addresses issues of the project’s outputs or physical accomplishments, financial performance and client satisfaction. Process evaluation can answer questions about procurement (did it

proceed smoothly?), the effectiveness of decision making and communication among project managers and implementors, and the value and degree of beneficiary participation. The Philippines UHN took a more operations research approach and used process evaluation to examine why the same inputs in different settings produced different results. Impact evaluation focuses on the project's successful change of negative nutrition conditions such as incidence of low birth weight babies, prevalence of severe malnutrition in 6–24 month-olds, incidence of iodine deficiency disorders, etc. as well as success at outreach to non-participating, high risk groups and overall coverage of the target population.

*Selection of indicators* depends on the project objectives, nature of the impact(s) being measured, capacity of project staff to implement the M/E system and time and resource constraints of each project or component. Experience from Africa and India points to the need to limit the number of indicators to avoid "data fatigue". Refer to Tool #2, *Nuts and Bolts of Nutrition*, for suggested core indicators and examples of project indicators from several recent Bank nutrition projects.

*Study methodologies for M/E* are a mixture of quantitative and qualitative techniques: Bank nutrition projects have used beneficiary analysis of project performance, standard quantitative measurement of input/output indicators, structured and unstructured interviews with key informants, focus groups, participant observation, and community forums among others. Qualitative feedback on program performance is a particularly important complement to standard quantitative service statistics. In addition to enriching project management's understanding of potential trouble spots in delivery, it increases local accountability of service providers to their clients. *FAO Guidelines for Participatory Nutrition Projects* (1993) describes clearly the array of qualitative assessment methods for use in the appraisal process and design of the M/E system. Valadez and Bamberger (1994) also offer detailed guidelines for qualitative and quantitative data collection as well as principles of sample design. Although not nutrition-specific, they are clear and practical.

*M/E budgets.* Bank project experience points to the need for distinct budgets for monitoring and evaluation activities. The Philippines Urban Health and Nutrition M/E budget was 5 percent of base costs, the Senegal Community Nutrition project budget was 6 percent and the Bangladesh Integrated Nutrition project allocated 8 1/2 percent to M/E activities. The Tamil Nadu Integrated Nutrition project used only 1 percent of project resources for M/E because an independent government agency was responsible for project evaluation.

Task managers are referred to Tool #10, *Monitoring and Evaluation: Tools to Measure Achievement*, for more detailed information and guidelines.

#### ***Task 4. Initiate economic analysis of intervention options***

To choose the strategies best able to address selected problems of malnutrition in a particular context, economic analysis of the intervention and delivery options needs to be carried out during preparation. Task managers should refer to the in-depth discussion of methodologies and issues in Tool #3, *The Economic Analysis of Nutrition Projects*. Five case studies provide examples of the analytical methods in practice. A synopsis of Tool #3 (Phillips and Sanghvi, 1996) follows.

The basis for economic analysis has been established by this point in project development through the identification of the nutrition problem(s) to be addressed by the project and the programmatic options for tackling them. The next step is to describe in detail the options being considered and estimate the costs and benefits or effectiveness of each option. Implicit in these considerations of costs and benefits are questions of targeting (what criteria, if any), different types of delivery systems, optimal scale of the operation(s), and mix of inputs (e.g., food, education, training, etc.). Alternative providers and implementing agencies (public or private), and the variety of implementation instruments (direct provision, subsidies, or regulations) must also be considered.

*Costs.* Estimating the costs of the project or component involves calculating the comprehensive cost data as well as the opportunity costs of all additional resources required for implementation. Project inputs can be grouped in categories such as: personnel, materials and supplies, utilities, buildings, and equipment. The costs of capital goods need to be separated from recurrent costs because of different treatment in the cost calculations and because analysis of recurrent costs will be needed for discussions of project sustainability.

*Sources of data.* Modifying or adapting cost estimates may be possible in the case of scaling up from a pilot project or when replicating a program. However, existing cost data are often unavailable or inadequate. In most instances it will be necessary to use the “ingredients approach,” deriving estimates from predictions about likely quantities and prices of required inputs. Such estimates require a good understanding of the technical content of the intervention(s) and a realistic assessment of project wastage.

*Estimating effectiveness.* Choosing an appropriate indicator of effectiveness and measuring its value for each of the project interventions are the two basic steps needed for this part of the exercise. In selecting the indicator, strive for the simplest measure common to all alternatives under consideration, and one that will change proportionately with welfare. The indicator must also have comparable welfare implications for each intervention option. For example, it is not possible to use morbidity reduction as the indicator of effectiveness for one intervention and mortality reduction for a second. If the alternative strategies for tackling a problem such as vitamin A deficiency are very different, it may be necessary to do a cost-benefit analysis.

*Estimating benefits.* Cost-benefit analysis demands that the outcomes of nutrition interventions can be captured in monetary units. In some instances, this is a straightforward task. For instance, the switch to breastfeeding results in quantifiable savings on formula, bottles, and decreased morbidity due to diarrheal disease (with reduced medical fees, drug costs, time for travel to clinic, etc.). Consumption benefits such as improvements in the

quality of life and increased leisure time due to decreased morbidity are less easily quantified.

*Analyzing the results.* Comparisons of project options in cost-benefit analysis offer the possibility of selecting between two types of projects having different main outcomes or assessing whether or not a project is worthwhile independently of a comparison with alternative interventions. For interventions with identical outcomes use cost-effectiveness analysis; if one intervention achieves more impact at the same or lower cost, it is the optimal choice. More complicated scenarios are also discussed in the tool.

The uncertainties inherent in the process of estimating costs, benefits, and effectiveness make sensitivity and risk analysis important additional tools to employ in the decision-making process. Examples of these analytical methods applied to the health sector are cited in the module.

---

*Status check:* By this stage, project objectives should be clear. Nutrition interventions to address specific problems have been identified and scrutinized using cost-benefit or cost-effectiveness analysis to confirm or change the proposed project design. Indicators have been selected for the M/E system to best capture the project's track record for service delivery *and* impact. Consultation with borrower country counterparts and project staff is particularly important now, before the start of the appraisal process.

---

**K**ey Question: *How can we ensure that the nutrition project/component will have the greatest impact on malnutrition in the target population?*

---

### **Tasks for project appraisal**

1. Evaluate the technical content of the project
  2. Assess the monitoring and evaluation system
  3. Appraise project targeting
  4. Appraise training and supervision plans
  5. Appraise institutional capacity
  6. Finalize the economic analysis
  7. Assess financial viability
  8. Procure inputs
- 

“Appraisal provides a comprehensive review of all aspects of the project and lays the foundation for implementing the project and evaluating it when completed (Baum, 1982).” The appraisal process examines the technical, institutional, economic and financial conditions of the project and the task manager must justify decisions regarding project design during this stage.

### **Task 1. Evaluate project technical content**

The detailed technical specifications (inputs, activities) of specific nutrition interventions will be covered in forthcoming tools. These will serve as guidelines for project design and as references for technical appraisal. Examples of technical aspects of the project subject to review include:

- facility building plans (although nutrition services will often be delivered through existing facilities such as health posts and schools),

- the technical basis for selecting food and micronutrient supplements, supplementation and deworming protocols, and consistent, accurate nutrition education messages,
- equipment specifications ( e.g., weighing scales, growth cards, biochemical/laboratory-based diagnostic supplies, logistical systems and supplies for micronutrient and food supplements and anthelmintics, storage facilities and on-site food preparation equipment, training materials, supply of high quality fortificants, fortification equipment, etc.),
- staff training programs and adequacy of supervision plans,
- the project communications strategy (looking closely at the emphasis, training, and support for counseling and devising a participatory process for identifying client-centered messages for behavior change), and
- industry protocols for fortification and the regulatory system for any national food fortification strategy.

### ***Task 2. Assess monitoring and evaluation system***

Strengthening the monitoring and evaluation (M/E) of projects is a Bankwide priority. Advancing borrower ownership of M/E systems, developing and sustaining Bank staff interest in/attention to M/E over the life of project, using data to effect change in project direction, and providing adequate technical M/E resources to staff and projects are central to improved performance.

During the appraisal exercise, the following questions will guide judgments about the plan for monitoring and evaluating project performance (management, finances, implementation, and impact):

- Is the aim of the M/E system clearly described and appropriate?

- Are the types and sources of information planned for collection, and proposed use of the data adequate and appropriate?
- Are the proposed indicators appropriate for project goals and objectives?
- Are the inputs for developing/strengthening the M/E system adequate and appropriate?
- Is the plan for collection, analysis and use clear?
- Is the administrative structure for the system functional?
- Is community participation planned for/apparent?
- Is the M/E budget adequate?

***Task 3. Appraise project targeting***

Increased project effectiveness and efficiency, lower costs, and increased impact have been attributed to successful targeting. Possible targeting strategies for nutrition interventions include:

- geographic targeting by poverty status or health risk ( e.g., incidence of iodine deficiency or prevalence of helminth infections);
- seasonal targeting to address periods of insufficient food availability, high metabolic stress at planting or harvest times, unemployment, or increased morbidity due to climatic patterns such as monsoons;
- nutrition status (e.g., moderate and severe malnutrition);
- reproductive cycle targeting (i.e., women receive nutrition services and education at critical life cycle points such as menarche, pregnancy, lactation; the Bangladesh Integrated Nutrition project is piloting the targeting

of newly married women and their families from the time of marriage through the first two years after the birth of her first child);

- gender targeting (e.g., all female-headed households in a community, all adolescent females);
- age targeting (e.g., all children 0–24 months-old);
- self-targeting of food (e.g., those commodities consumed predominantly by the poor such as sorghum and millet, processed cassava flour, and certain legumes).

Appraise the rationale for the proposed targeting strategies: does project targeting link to the identified nutrition problems and the earlier assessment of institutional capacity? Make sure that the administrative costs of targeting do not exceed the savings realized through reduced leakage to unintended beneficiaries.

#### ***Task 4. Appraise training and supervision plans***

For most community-based nutrition programs, appraisal of training plans would include technical content of the pre-service training curriculum, adequacy of course length and training facilities, staff/student ratios, and mixed, audience-appropriate teaching methodologies. Plans should also include regular, field-based, in-service training (one week semiannually in Tamil Nadu) throughout the course of the project to reinforce training messages, motivate workers, and engage in group problem-solving. (Refer to Tool #12, *Management and Supervision: Strategy for Project Success*, for in-depth treatment of the subject.)

The Second Tamil Nadu Integrated Nutrition project delivered four types of training to staff at every level. Pre-service training for newly recruited nutrition workers, orientation training for existing staff in the project areas, regular in-service training, and problem-solving workshops. The new recruits at the

most peripheral level (community nutrition centers) received eight weeks of initial training. Project managers received two weeks of management training, doctors would receive two to three day workshops on the project and specialized staff (e.g., district communication officers and statistical inspectors) all received specialized orientation training.

Supervision is most productive when it is treated as technical assistance to the field staff of the project. A low supervisor/worker ratio is key to effective supervision. In Tamil Nadu, each supervisor worked with 10 field workers allowing a full day with the worker in the field each fortnight. Experience with extension workers from the agriculture sector suggests an optimal ratio of 1:6–8. Such ratios are important for quality as well as quantity of supervisory contacts. On-the-job observation allows for reinforcement of positive worker skills and teaching by example for problematic tasks. Downward accountability is increased because of the direct interaction of the project managers with beneficiaries. It may be necessary to include training for managers/supervisors in how to supervise in a positive, constructive way—one African field worker once described supervision as being like an ambush, and many task managers will have seen authoritarian, negative, fault-finding behavior from supervisors.

#### ***Task 5. Assess institutional capacity***

Much of the relevant information for appraising institutional capacity has already been collected and analyzed during project identification. Decisions about the types of interventions and best methods for delivery of services have been (optimally) based on candid assessments of implementation and contractual capacity, management, and budget/accounting skills at every level from the concerned central government agency on down. It is probably most important for a task manager to be realistic about the constraints (staff, time, and financial resources) on implementation of the component or project and work within those boundaries with an eye toward *beginning* the longer process of institutional change and development.

In many countries, increased awareness of the negative impact of malnutrition on human resources and aid and technical assistance over the past two decades have greatly improved the institutional base for nutrition programming. However, in many others capacity remains negligible. In these situations, institution and capacity building remains "...perhaps the most important purpose of Bank lending (Baum, 1982)." Experience and advice on exactly how to strengthen institutions varies among projects and continents. The *Nutrition Strategy for the Sahel* (Marek and Heyward, 1994) recommends that most program planning and implementation responsibilities be moved from the center to the province and district levels. Efforts to strengthen institutions would focus on the periphery.

In Madagascar, a long history of bureaucratic delays and procurement problems because of weak managerial capacity in the public sector plagued project execution. To address these problems, the Food Security and Nutrition project focused on building private sector and NGO capacity to deliver project services. A project management structure outside the central administration is staffed by personnel recruited on a contractual basis from the private sector. NGOs, local communities, and private entities are involved in project execution and the project's social fund is set up as a private non-profit association operating under private sector rules.

#### ***Task 6. Finalize economic analysis of the project***

The economic analysis of the project, initiated during project preparation, will be completed at appraisal. Review the methodology used for economic analysis. Look closely at costing techniques (underestimation of costs is not uncommon in nutrition projects) for inclusion of opportunity costs, comprehensive inputs costs, and activity costs. Was the full range of alternative approaches to the problem examined? Have varying scale, targeting criteria, delivery systems, input packages, timing, etc. been fully explored? Were the multiple dimensions of nutrition benefits clearly compared (Phillips and Sanghvi, 1996)?

Using the results of cost-effectiveness or cost-benefit analysis, determine which nutrition interventions are optimal for achieving the greatest impact on malnutrition for the lowest cost in the context of the project.

***Task 7. Assess financial viability***

Financial appraisal provides the basis for assessing the likelihood of project sustainability. What is the projected fiscal impact of the project? What are the possibilities for repayment over the life of the project and beyond? What is the realistic likelihood of obtaining recurrent funding? This last question depends a great deal on the involvement of the community from the beginning of the project, but there are multiple opportunities in the context of community nutrition programs for savings. Among them are the community production and preparation of food supplements, and use of community nutrition volunteers for child weighing and counseling, and delivery of micronutrient and food supplements.

For purposes of project implementation and operation, the details of the financial reporting and audit system must be appraised for all entities (private or public sector) involved in delivering services under/to the project.

Carry out risk analysis to identify economic, financial and political risks to the project; insure that the project has sufficient funds to meet capital outlays and recurrent costs of the project. The Madagascar Food Security and Nutrition project provides an excellent example of a joint risk analysis with the borrower. Bank staff and borrower counterparts gave high priority to the exercise. Numerous risks were identified and joint agreement was reached on steps to reduce these risks. Implementation, operation, and long-term sustainability of the project benefit substantially from a serious, participatory approach to risk analysis and financial appraisal.

### **Task 8. Procure inputs**

Detailed guidance on procurement in human resource projects is available in Sigurdsson and Villatoro's *Implementing Projects at an Arm's Length* (draft version, 12/95) and the revised version of Operations Directive 11.00, *Procurement* (revision underway). In the fifth edition of the Bank's Procurement Guidelines (January 1995), the explicit recognition that centralized procurement may not be efficient for projects with significant community participation is an important departure from tradition. Task managers must weigh the benefits of local control over decisionmaking and procurement against the costs to the borrower of not obtaining the most competitive price or economies of scale for bulk purchases (HDD, 1996).

Details of procurement specific to nutrition projects/components include the acquisition of micronutrient supplements, fortificants and industrial equipment for fortification of food with micronutrients, laboratory equipment for biochemical analysis of micronutrient deficiencies and for use in regulation of industry compliance with fortification specifications, deworming medication, and growth monitoring equipment (e.g., scales and height measurement boards) among others. See Appendix 5 for procurement contact information through the UNICEF Supply Division (formerly UNIPAC).

---

*Status check:* The appraisal stage is possibly the most critical time for "getting things right". The project's impact on nutrition status may be determined by the care and attention given to the appraisal process. Realistic assessment of institutional capacity, close examination of the technical basis for the project or component and good economic analysis should position the project to succeed, first at implementation and then throughout the project duration.

---

**K**ey Question: *How can the project launch, implementation, and supervision processes improve project delivery and help sustain positive change in the nutrition status of project beneficiaries?*

---

### **Tasks for project implementation/supervision**

1. Support project implementation
  2. Supervise the project
- 

#### ***Task 1. Support project implementation***

This stage signals the end of intense Bank staff involvement with the project as the borrowing country proceeds with construction (if part of the project) and start-up activities. Generic implementation guidance is available in Sigurdsson and Villatoro's *Implementing Projects at an Arm's Length* (draft version, 12/95) and in *The Task Managers Handbook*. Specific guidance to task managers of nutrition components and projects will cover the project launch workshop, the implementation manual, and best practices of the implementation process gleaned from earlier projects.

*Project launch workshop.* Previous experience with project launch workshops varies from contributing to the smooth beginning of a project to little more than a hollow public relations exercise. Often task managers are pre-occupied with the details of staffing, budgets, and initial start-up of resource flows to the various individuals and programs within a project, and the project launch is lost in the crunch.

One task manager suggests three possible purposes for the launch workshop: 1) a public relations event, intended mainly to familiarize key players in-country with the objectives and plan for the project and to build support

and cooperation, 2) a detailed planning session to ensure the smooth start of the project and agree on such things as the project process and impact targets/indicators, or, 3) a training session for project managers, or even for the full range of project implementors.

The FY93 Food Security and Nutrition project in Madagascar credits the widely-attended project launch workshop with contributing to the project's speedy success. Workshop participants ranged from cabinet ministers and representatives of NGOs to poor farmers, instilling a sense of common purpose, commitment and the importance of the project from the outset of implementation.

By contrast, the project completion report for the Malawi Second Family Health project points to the absence of a launch workshop as contributing to the project's performance difficulties. One of several "standard practices lessons", "...a project launch workshop (which includes all line managers) should be held in order to define responsibilities and bring managers on board; if line managers are unclear about project objectives, and their role in achieving them, it will be more difficult for them to be motivated to carry out activities." Much the same criticism was leveled at the Nutrition and Community Health II project in Indonesia. Project staff were not familiar with Bank procedures and "...the training provided in the start up workshop was inadequate."

In the case of a nutrition component, it is advisable that only those involved with this part of the project attend and participate on the designated nutrition day or days of the workshop agenda. Again, previous experience suggests that this will ensure focused involvement by workshop participants, and avoids the problem of disinterested, extraneous individuals who can impede progress toward the desired objectives of the workshop.

Past experience with project launches suggests the following:

1. A prerequisite for success is being clear about the workshop's purpose and ensuring good communication of that purpose to all participants.
2. The workshop must be well planned. The implementing ministry or agency's staff should be involved in planning the workshop.
3. Consider hiring a skilled facilitator. The Bank training course "Planning and Facilitating Meetings" teaches useful skills for workshops.
4. Use a launch workshop to preempt problems that have emerged in other projects (whether financed by the Bank or not). For example, the Zimbabwe nutrition unit staff had many concerns regarding their component budget and needed assistance with navigating the project's bureaucracy in order to get things underway. In retrospect, it would have been useful for the launch workshop to cover how component managers should go about getting something procured—what information to give to whom, when (how long before the input is needed), and to clarify who had authority to make decisions about project fund use.

*Implementation manual.* If project preparation has yielded detailed plans for all aspects of the project—technical components, delivery services, communications, monitoring and evaluation, organizational flow charts, estimated costs and budgets, personnel requirements and training/supervision needs—the implementation manual can be a comprehensive and effective tool for the implementation process. The exhaustive, 1980 TINP implementation manual is credited with contributing to the project's success. Beginning with the most peripheral worker, every detail of work routines, supervision and training protocols and curricula, procurement arrangements, project costs, and intervention guidelines were planned and incorporated in the implementation manual.

More recently, the FY93 Madagascar Food Security and Nutrition project implementation manual contributed significantly to the smooth launch of the project. The detailed manual was completed as a prerequisite to negotia-

tions. It was supplemented by model contracts between the project and NGOs in charge of implementation, between the NGOs and the communities requesting nutrition centers, and between the NGOs and their supervisors. Agreement to the details of project implementation and relationships between involved agencies and individuals occurred during negotiations so that the project began with clarity about procedures, communication pathways, and job descriptions/responsibilities.

We strongly suggest that the task manager require the pre-appraisal and appraisal mission team to produce contributions for the implementation manual as part of their terms of reference, or to have a post-appraisal mission to prepare the manual in-country, in collaboration with those who will be using it. Keep the manual practical and clear.

*Lessons learned: Tamil Nadu.* In the first Tamil Nadu Integrated Nutrition project (PCR Report #9259), smooth implementation was attributed to a separate project coordination unit staffed by a senior administrative service (IAS) officer; project management was top priority and not one of several competing tasks. In addition, the project was piloted in only one administrative block during its first year allowing for experimentation and design change. The project then expanded rapidly in subsequent years. Instead of the usual semiannual supervision missions, interdisciplinary Bank teams visited the project three or four times during the crucial first year. A Project Management Fund was also established from which the project coordinator could access resources for studies and operations research at her own discretion. Sixty-three small studies were financed during implementation, resulting in significant service delivery improvement. Finally, interested community members were recruited—prior to the start-up of services—to act as project advocates and educate the community about the purpose and methods of the project. They set the stage for a community-wide appreciation for the cost-effective strategy of “food as medicine” (potentially a difficult concept that would alienate households whose children were not receiving the food supplements) and solidified project ownership by the community.

A review of the TINP by the Cornell Food and Nutrition Policy Program characterized project implementation strengths as: attention to detail in task specification, pragmatic worker selection criteria, quality of training, and some midproject design modifications based on program management data. "Attention to the very minutest of details in planning the project is so intense that its contribution to the successful implementation of TINP cannot be overestimated. However, what is indeed remarkable is the fact that this kind of detailed planning has not detracted from the built-in flexibility in program implementation (Shekar, 1991)."

### ***Task 2. Supervise the project***

Baum (1982) writes: "Supervision is the least glamorous part of project work, but in several respects it is the most important. [It] is primarily an exercise in collective problem solving, and, as such, is one of the most effective ways in which the Bank provides technical assistance to its member countries." Experience with nutrition projects supports this view.

Both in India and Kenya, task managers assembled teams of outstanding, senior technical nutrition consultants and used them for supervisory missions over the life of the project. This ensured consistent quality of the technical assistance and allowed the supervision team to assess project changes over time. Perhaps even more important was the development of an *ongoing* relationship and constructive dialogue between project staff, concerned government officials and the Bank.

Maximize personal relationships that develop on supervision mission through frequent phone and fax contact with project staff. Extra efforts at communicating (e.g., arranging for electronic mail hook-up with the project) will help to compensate for inadequate supervision time. Earmark funds for supervision; experiment with using locally based technical assistance (such as technical staff in a UNICEF office) for local project supervision. Gauge supervision needs on the basis of institutional capacity within implementing

agencies. When there is a choice between projects for investment of supervisory resources, select the more complex or innovative project.

Designing new projects requires significant investment of Bank staff time, creativity and financial resources. It is virtually imperative that supervision is of excellent quality to assure the success and sustainability of the project. Tool #12, *Management and Supervision: Strategy for Project Success*, elaborates on lessons learned and discusses in greater detail the components of effective supervision missions.

**K**ey Question: *What are the lessons learned—positive and negative—and how will they influence subsequent project(s) design?*

Much of what has been discussed in sections on monitoring and evaluation, selection of indicators, and the use of data to inform project design modifications is applicable to this final stage of the project. In similar fashion, the final evaluation of a nutrition project or component will help to shape subsequent projects either as follow-on activities or as pilot projects are scaled-up to national programs.

For many projects, high staff turnover is a problem on both sides. Task managers and in-country staff may change during the course of the project. This makes a system of careful record-keeping mandatory if the documentation needed for evaluation of the project is going to be available at the close of the project. As monitoring and evaluation systems receive greater attention early on in the project development cycle, data collection protocols will improve.

In the context of the “new” Bank with its emphasis on delivering high quality projects on the ground, the project completion exercise may well take on an increased importance in its role as the primary vehicle for communicating important lessons of experience. The Tamil Nadu Integrated Nutrition project has to be invoked once again, as a model for insightful analysis of project performance and impact. The project completion reports for TINP I (one by the Bank and one by the borrower) are highly informative, communicating lessons of experience (both positive and negative) and laying out useful concepts of project design and implementation for task managers.

Where greater effort would broadly benefit task managers involved in nutrition work is in more widespread dissemination of project completion/evaluation findings across regions and sectors. Non-standard dissemination efforts include the HDD nutrition newsletter, *New & Noteworthy in Nutrition*,

case studies presented at periodic Friends of Nutrition lunch forums, several of the case studies in the *Investing in People* booklet and folder (1995), and the exemplary sector work, *Nutrition in Zimbabwe* (Tagwireyi and Greiner, 1994).

- ACC/SCN (Administrative Committee on Coordination/SubCommittee on Nutrition). February 1991. *Controlling Iron Deficiency*. ACC/SCN State-of-the-Art Series, Nutrition Policy Discussion Paper No.9. United Nations ACC/SCN: Geneva.
- ACC/SCN. 1992. *Second Report on the World Nutrition Situation*. Vol. I, "Global and Regional Results." Prepared in collaboration with the International Food Policy Research Institute. Washington, D.C.
- ACC/SCN. January 1994. *Controlling Vitamin A Deficiency*. ACC/SCN State-of-the-Art Series, Nutrition Policy Discussion Paper No.14. United Nations ACC/SCN: Geneva.
- Baum, W. C. 1982. *The Project Cycle*. The World Bank: Washington, D.C.
- Berg, A., S. Basta, N. Koffsky, F. J. Levinson and J. Pines. 1986. *Guidelines for Work in Nutrition*. PHN Technical Note 86-12. The World Bank: Washington, D.C.
- Del Rosso, J. M. and T. Marek. January 1996. *From Surviving to Thriving: Meeting the Nutrition and Health Needs of School-Age Children in Africa and Other Developing Regions*. Draft paper. The World Bank: Washington, D.C.
- Dunn, J.T. and F. Van Der Haar. 1990. *A Practical Guide to the Correction of Iodine Deficiency*. International Council for Control of Iodine Deficiency Disorders: Netherlands.
- FAO (Food and Agriculture Organization of the United Nations). 1993. *Guidelines for Participatory Nutrition Projects*. FAO: Rome.
- Favin, M. and M. Griffiths. 1992. *Social Marketing of Micronutrients in Developing Countries* (mimeographed document). The World Bank: Washington, D.C.
- Galloway, R. 1993. *Global Indicators of Nutritional Risk (II)*. HRO Working Paper Series No. 6. The World Bank: Washington, D.C.

- Greiner, T. 1989. *The Building of Nutrition Institutions: A Search for Guiding Principles Based on SIDA Experience in Africa*. Uppsala University, Sweden (paper prepared for ACC/SCN).
- Heaver, R. 1991. *Using Field Visits to Improve the Quality of Family Planning, Health, and Nutrition Programs: A Supervisor's Manual*. Working Paper Series No. 797. The World Bank: Washington, D.C.
- HDD (Human Development Department). January 1996. *Getting Results in the Social Sectors* (mimeographed document). The World Bank: Washington, D.C.
- King, F.S. and A. Burgess. 1993. *Nutrition for Developing Countries, 2nd Edition*. Oxford: Oxford University Press.
- Kostermans, K. 1994. *Assessing the Quality of Anthropometric Data: Background and Illustrated Guidelines for Survey Managers*. Living Standards Measurement Study Working Paper No. 101. The World Bank: Washington, D.C.
- Levin, H.L., E. Pollitt, R. Galloway, and J. McGuire. 1993. "Micronutrient Deficiency Disorders." In D. Jamison, W.H. Mosley, A. R. Measham, and J.L. Bobadilla, eds., *Disease Control Priorities in Developing Countries*. New York: Oxford University Press.
- Lindert, K. October, 1995. *Romania: Analysis of Generalized Consumer Food Price Policies*. Draft terms of reference. The World Bank: Washington, D.C.
- Marek, T. and D. Heyward. 1994. *A Nutrition Strategy for the Sahel*. AF5PH, The World Bank (mimeographed document).
- McGuire, J. 1994. *Enriching Lives: Overcoming Vitamin and Mineral Malnutrition in Developing Countries*. Development in Practice Series. Washington, D.C.: The World Bank.
- McGuire, J. March 1994. *Hidden Hunger III: Winning One Battle Against Anemia*. HRO Dissemination Notes Series. The World Bank: Washington, D.C.

- Mebrahtu, S., D. Pelletier, and P. Pinstруп-Andersen. 1995. "Agriculture and Nutrition." in Pinstруп-Andersen, P., D. Pelletier, and H. Alderman, eds., *Child Growth and Nutrition in Developing Countries: Priorities for Action*. Ithaca: Cornell University Press.
- MkNelly, B. and C. Dunford. February 1996. *Are Credit and Savings Services Effective Against Hunger and Malnutrition: A Literature Review and Analysis*. Freedom from Hunger. Research Paper No. 1.
- Pelletier, D.L., E.A. Frongillo, D.G. Schroeder and J.P. Habicht (1995) The Effects of Malnutrition on Child Mortality in Developing Countries. *Bull. WHO*, 73(4): 443–448
- Phillips, M. and T. Sanghvi. 1996. "The Economic Analysis of Nutrition Projects" in *The Nutrition Toolkit*. The World Bank: Washington, D.C.
- Popkin, B.M. 1993. "Nutritional Patterns and Transitions." *Population and Development Review*. Vol. 19(1).
- Shekar, M. 1991 *The Tamil Nadu Integrated Nutrition Project: A Review of the Project with Special Emphasis on the Monitoring and Information System*. Cornell Food and Nutrition Policy Program: Ithaca.
- Sigurdsson, S. and E. Villatoro. December 1995. *Implementing Projects at an Arm's Length: A Tool Kit for Human Resources Projects (Draft)*. Human Development Department, The World Bank: Washington, D.C.
- Sommer, A. 1995. *Vitamin A Deficiency and its Consequences: A Field Guide to Detection and Control, 3rd Edition*. WHO: Geneva.
- Tagwireyi, J. and T. Greiner. 1994. *Nutrition in Zimbabwe*. Directions in Development Series. The World Bank: Washington, D.C.
- Timmer, C. P., Falcon, W.P., and S. R. Pearson. 1983. *Food Policy Analysis*. Baltimore: Johns Hopkins University Press.

Valadez, J. and M. Bamberger, eds. 1994. *Monitoring and Evaluating Social Programs in Developing Countries: A Handbook for Policymakers, Managers, and Researchers*. Washington, D.C.: The World Bank.

WHO (World Health Organization). 1995. *Physical Status: The Use and Interpretation of Anthropometry*, Report of a WHO Expert Committee. WHO Technical Report Series: Geneva.

WHO Ad Hoc Committee on Health Research Relating to Future Intervention Options. December 1995. *Investing in Health Research and Development* (Draft).

WHO/UNICEF Consultation. May 1994. *Indicators for Assessing Vitamin A deficiency and Their Application in Monitoring and Evaluation Intervention Programs*. Geneva.

WHO/UNICEF/ICCIDD Consultation. September 1993. *Indicators for Assessing Iodine Deficiency Disorders and Their Control Through Salt Iodization*. WHO Micronutrient Series: Geneva.

WHO/UNICEF/UNU Consultation. May 1994. *Indicators and Strategies for Iron Deficiency and Anemia Programs*. Draft report. Geneva.

**Appendix 1: Assessment of Nutrition Status: Anthropometric Indices**

Anthropometric indices are combinations of measurements (e.g., height, weight) related to body size and composition. At the individual level, anthropometry is used to assess the person as being in need of special consideration or to assess a response to some intervention. In populations, anthropometric data are used to make decisions about the need for intervention programs, what type of interventions are needed and to whom they should be delivered. *Physical Status: The Use and Interpretation of Anthropometry*, A Report of a WHO Expert Committee, 1995, provides a clear, detailed treatment of the subject. For Internet users, the FAO-funded *Anthropometry Resource Center* at [HTTP://www.odc.com/anthro/](http://www.odc.com/anthro/) provides tutorial programs and a desk reference.

Data for malnutrition should be presented as distributions: the proportion of the population falling below a specific centile, standard deviation or Z-score. A Z-score is the difference between the value for an individual and the median value of the reference population, divided by the standard deviation for the reference population. It is the preferred reporting system because it normalizes the age-specific variances of different indicators at different ages. The reference distribution is normal with 2.3% of healthy children falling 2 standard deviations ( $-2Z$ ) below the median, the usual cutoff used to define malnutrition. If significantly more than 2.3% of children fall below  $-2Z$ , then there is probably an undernutrition problem. If significantly more than 2.3% of children are above  $+2Z$  weight for height then obesity (overnutrition) is a likely problem (Galloway, 1993 and WHO, 1995).

Sampling considerations are important when using anthropometry for assessment of populations. Strategies need to take account of age ranges, seasonality, geographical areas, and socioeconomic groups (WHO, 1995) as well as more generic considerations of the relationship of sample size to statistical power and confidence intervals.

Definitions of some of the most common anthropometric indices follow:

- Weight for Age (underweight) is the most common assessment of child nutrition status; it is routinely collected in growth promotion programs and surveys, and is the best indicator for children three and under because of the difficulty of assessing height accurately in these age groups. Children with weight for age less than two standard deviations ( $-2Z$ ) of the reference population median are underweight. Low weight for age may reflect either wasting or stunting, or both. (Note: 80 percent of reference median is approximately  $-2Z$ ; 70 percent is approximately  $-3Z$ .)
- Height for Age (stunting) is a measure of linear growth. Nutritional deprivation and frequent bouts of infection rapidly affect skeletal growth and result in stunting. In most developing countries, the proportion of stunting in children increases up to the age of 24 to 36 months and then remains constant (Galloway, 1993). Measuring height for age is not used generally for monitoring an individual child's growth, but rather measures change at the community level over time. It is a useful indicator for targeting a range of interventions because it reflects the cumulative effects of socioeconomic, health and nutrition problems. A child with height for age  $-2Z$  below the median for the reference population is considered stunted.
- Weight for Height (wasting): This indicator measures acute or short-term exposure to a negative environment. Wasting is sensitive to changes in calorie intake or the effects of disease. Wasting can be calculated without knowing the age of a child and thus has utility where birthdates are unknown. It is a good targeting indicator for food supplementation in areas where wasting is common. Although sometimes used, weight-height is not useful for growth monitoring because it is insensitive to monthly changes in growth. Prevalence of wasting is highest between 12–24 months of age due to high incidence of diarrhea, inadequate food during weaning, and anorexia due to morbidity. The proportion of children with weight for height  $-2Z$  below the reference population median are wasted.
- Mid upper arm circumference (MUAC): This is a measure of the diameter of fat and muscle tissue of the upper arm. Data collection is relatively

easy, requiring minimal time, equipment or training. A color coded arm tape (*Shakir* strip) is easily made from local materials and is appropriate for illiterate/innumerate workers; red signifies severe malnutrition, yellow is moderate malnutrition, and green signals adequate nutrition (King and Burgess, 1993). In children between the ages of one and five, any child with MUAC below 12.5 cm is severely undernourished and any child with MUAC between 12.5 and 13.5 cm is moderately malnourished. As a predictor of low birthweight infants, MUAC of pregnant women is of limited value. Cut-offs for predicting intrauterine growth retardation of infants range from less than 20.7 cm to less than 23 cm.

- Body mass index: Measures body weight corrected for height in adults:  $\text{weight (kg)/height(m)}^2$ . The ratio is used most often for nonpregnant adults from 20–65 years of age. A BMI below 16 indicates undernutrition; 16–18.5 is possible undernutrition; 18.5–25 is probably adequate nutrition; 25–30 is possible obesity; over 30 is obesity (King and Burgess, 1993). For pregnant women, measuring absolute weight is a better indicator of risk of poor pregnancy outcome.
- Birth weight: The birth weight of a baby is a widely used anthropometric index. Birth weight reflects both duration of gestation and rate of fetal growth; low birth weight is strongly associated with higher risk of mortality, morbidity, and impaired development (WHO, 1995). Low birth weight is linked causally to poor maternal nutrition status during pregnancy. Because this indicator is usually collected for births occurring in hospitals or private clinics, bias in either direction (births are to women of higher socioeconomic status who tend to be well nourished or hospital births represent high risk, complicated births with skewed percentages of malnourished mothers) must be assessed. Where such data do exist for a broad population group, they can be useful as an indicator of community nutrition status. 2.5 kilograms (5 lb 5 oz) is the cutoff to define low birth weight.

**Table A1: Proposed Classification of Worldwide Prevalence Ranges of Stunting and Wasting among Children Under 5 Years of Age**

Prevalence group	Prevalence rates (% of children below $-2Z$ -scores)	
	Low height-for-age (stunting)	Low weight-for-age (underweight)
Low	< 20	< 10
Medium	20–29	10–19
High	30–39	20–29
Very high	$\geq 40$	$\geq 30$

(WHO, 1995)

**Table A2: Regional Prevalence of Underweight Children (0–60 months) in Developing Countries (1990)**

Region	Percent underweight
Sub-Saharan Africa	29.9
Near East/North Africa	13.4
South Asia	58.5
South East Asia	31.3
China	21.8
Middle America/Caribbean	15.4
South America	7.7
Global total	34.3

(ACC/SCN, 1992)

*Undernutrition:* Anthropometry will often be used by Bank staff to verify the existence of a nutritional problem in a population and to assess its magnitude. This information will help to target project resources to communities with the greatest nutrition needs. WHO (1995) has proposed the prevalence ranges in Table A1 to classify levels of stunting and underweight for global monitoring.

Two references are recommended for country-specific information on prevalence of underweight children prior to the country visit: *Global Indicators of Nutritional Risk (II)* by Rae Galloway, Human Resources Development and Operations Policy Working Paper No. 6 and *Second Report on the World Nutrition Situation*, ACC/SCN, October 1992. Both are available from the nutrition group in the Human Development Department. Table A2 provides regional prevalence rates for comparative purposes.

*Overweight:* Many borrower countries are experiencing the "nutrition transition" described by B. Popkin(1994) in which diet changes (shifting to excessive intake of fat and cholesterol and reduced intake of fiber-rich food and fresh fruits and vegetables), physical activity drops with a shift towards a more sedentary lifestyle and there is an increased prevalence of degenerative diseases (e.g., non-insulin dependent diabetes, cardiovascular disease, certain types of cancer). In the same country (for example in many countries in Latin America and East Asia) subpopulations which are characterized by undernutrition and communicable diseases can coexist with groups experiencing problems associated with overnutrition. Alternatively, a country can be more uniformly experiencing problems of overnutrition (as in Romania).

Indicators of overweight are: BMI, abdominal fatness, and adult overweight. The WHO Expert Committee on physical status recommends that the cut-off points for degrees of overweight not be interpreted in isolation, but always in combination with other determinants of morbidity and mortality (e.g., disease, smoking, blood pressure, serum lipids, glucose intolerance, type of fat distribution, etc.).

Suggested cut-off points (WHO, 1995) for BMI are:

- Normal range BMI: 18.50–24.99
- Grade 1 overweight BMI: 25.00–29.99
- Grade 2 overweight BMI: 30.00–39.99
- Grade 3 overweight BMI:  $\geq 40.00$

## **Appendix 2: Assessment of Nutrition Status: Clinical and Biochemical Indicators**

1. Vitamin A deficiency affects the body's epithelial tissue, can cause progressive eye damage leading to blindness and negatively affects immune competence. Mortality rates are increased among children with even mild vitamin A deficiency.

Traditionally, identification of vitamin A deficiency in populations relied on clinical signs and symptoms of xerophthalmia (a range of disorders affecting the eye, beginning with nightblindness and progressing to corneal damage and eventual blindness). Recent studies now suggest that the presence of clinical signs and symptoms of the deficiency indicates that depletion of vitamin A is well beyond the point for determining that a public health problem exists. Subclinical deficiency can be identified through biochemical analyses of blood samples. However, no biochemical indicators for use under field survey conditions are both adequately sensitive and specific to be used alone. Therefore, combinations of indicators and risk factors have been identified to determine when a public health problem is present. Refer to *Indicators for Assessing Vitamin A Deficiency and Their Application in Monitoring and Evaluating Intervention Programs*, Report of a joint WHO/UNICEF consultation, May 1994.

There is a public health problem when the prevalence in a population of at least two of the biological indicators of vitamin A status is below the cut-off. The level of public health importance is indicated by the prevalences noted in Table A3. Another basis for analysis (a proxy indicator) is the presence of one biological indicator of deficiency supported by at least four of a composite of demographic and ecological risk factors such as:

- Infant mortality rate (IMR) > 75/1000 live births; under-5 year mortality rate > 100/1000 live births;
- full immunization coverage in < 50% of infants;
- < 50% prevalence of breastfeeding in 6-month old infants;

**Table A3: Biological Indicators of Subclinical Vitamin A Deficiency in Children 6–71 Months of Age**

Indicator (cut-off)	Prevalences below cut-offs to define a public health problem and its level of importance		
	Mild	Moderate	Severe
<i>Functional</i>			
Night blindness (present at 24–71 months)	> 0 – < 1%	≥ 1% – < 5%	≥ 5%
<i>Biochemical</i>			
Serum retinol (≤ 0.70 μmol/l)	≥ 2 – < 10%	≥ 10 – < 20%	≥ 20%
Breast milk retinol (≤ 1.05 μmol/l)	< 10%	≥ 10 – < 25%	≥ 25%
RDR (≥ 20%) (Relative Dose Response)	< 20 %	≥ 20 – < 30%	≥ 30%
MRDR (ratio ≥ 0.06) (Modified Relative Dose Response) + S30DR (20%)	< 20 %	≥ 20 – < 30%	≥ 30%
<i>Histological</i>			
CIC/ICT <sup>3</sup> (Impression Cytology) (abnormal)	< 20%	≥ 20 – < 40%	≥ 40%

(Source: WHO/UNICEF, 1994)

- median dietary intake < 50% recommended safe level of intake among 75% of children 1–6 years of age;
- two-week point prevalence of diarrhea  $\geq$  20%;
- measles case fatality rate > 1%;
- no formal schooling for 50% of women 15–44 years of age;
- < 50% of households with a safe water source.

(WHO/UNICEF, 1994)

2. *Iodine*. Iodine deficiency disorders (IDD) is a group of conditions that may develop in people who are iodine deficient. Need for iodine is highest among infants, children, adolescents, and pregnant/lactating women. Women are more at risk of deficiency than men. IDD includes: goiter (enlarged thyroid gland), and hypothyroidism (characterized by lack of energy, apathy) which, in pregnant women, contributes to miscarriages, low birth-weight babies and babies born with congenital deformities. Irreversible brain damage in the fetus and in infants and retarded psychomotor development in children are also attributable to iodine deficiency.

One of the most convenient methods for identifying regions of iodine deficiency is to collect urine specimens and do goiter surveys on school children 6 to 12 years old. School children are easily accessible and are a marker for current iodine status. Goiter in adults may indicate long past (and not necessarily current) iodine deficiency. Designation of a public health problem is best based on two indicators of iodine status (see Table A4). If it is impossible to do a survey, quick cut-offs for a severe IDD problem are 1) more than 10% of the population with visible goiter, or 2) a significant number of men with large goiters (King and Burgess, 1993). Manual goiter assessment however, is very subjective and interobserver error can be high. Ultrasonic assessment of thyroid volume is far more accurate but requires expensive, sophisticated equipment. Consult *Indicators for Assessing Iodine Deficiency Disorders and Their Control Through Salt Iodization* (WHO September 1993).

**Table A4: Iodine Deficiency Disorders Prevalence Indicators and Criteria for Public Health Problem**

Indicator	Mild	Moderate	Severe
Goiter (grade > 0 measured in school children)	5.0–19.9%	20.0–29.9%	≥ 30.0%
Thyroid volume (> 97th centile by ultrasound)	5.0–19.9%	20.0–29.9%	≥ 30.0%
Urinary Iodine (median µg/l measured in school children)	50–99	20–49	< 20
Thyroid Stimulating Hormone (TSH) 5mU/l whole blood	3.0–19.9%	20.0–39.9%	≥ 40.0%
Thyroglobulin (Median Tg) (ng/ml serum)	10.0–19.9	20.0–39.9	≥ 40.0

(Source: WHO, 1993)

3. *Iron.* Iron deficiency anemia is the most common nutritional disorder, affecting over one billion people worldwide. Preschool children and reproductive age women are particularly at risk, but anemia also negatively affects school children and working men. Untreated iron deficiency leads to increasingly severe anemia, reduced work capacity, diminished learning ability, increased susceptibility to infection and greater risk of death associated with pregnancy and childbirth (ACC/SCN, 1991).

Detecting anemia (caused most often by lack of iron but also by sickle cell disease, malaria and hookworm) is an imprecise exercise. Measuring the amount of hemoglobin (Hb) in the blood is the most common and easiest indicator to collect, although it is not highly sensitive. It is useful however, in assessing population-based prevalence of anemia for nutrition surveillance and service delivery planning purposes (see Table A5).

**Table A5: Hemoglobin Cutoffs Used to Define Anemia  
(Hb below these levels indicates anemia)**

	Hemoglobin level (g/100ml)
Children 6 months to 5 years	11
Children 6 years to 14 years	12
Men	13
Women (not pregnant)	12
Women (pregnant)	11
<b>Mild, moderate, and severe anemia</b>	
Mild	Below the values given above, but more than 10
Moderate	7–10
Severe	Below 7

(Source: ACC/SCN, 1991)

For detailed information about assessing iron deficiency, refer to *Indicators and Strategies for Iron Deficiency and Anemia Programs*, Draft Report of the WHO/UNICEF/UNU Consultation, May 1994.

### **Appendix 3: Micronutrient Supplement Dosages**

1. *Vitamin A*. Supplementation with vitamin A capsules is recommended for use in populations where vitamin A is endemic. There are several entry points (both in place and time) that provide good opportunities for delivery of supplementation:

- Immunization contacts with children 6–12 months;
- Delivery or postnatal visit contact with mother for provision of single large dose to improve vitamin A content of breastmilk, optimally within the first 4 weeks postpartum, but may be administered up to 8 weeks after child-birth (it must not be administered to a pregnant woman because of linkage to fetal abnormalities);
- Any health post or clinic visit by children ages 1–5 years.

See Table A6 for recommended schedule/dosage of prophylactic vitamin A. Case management of measles and severe protein-energy malnutrition requires therapeutic use of high dose vitamin A supplements (this should not be limited to children with clinical vitamin A deficiency)(ACC/SCN, 1994).

2. *Iodine*. Iodization of salt is the preferred approach for supplementation of populations with IDD. Salt is a dietary necessity, is consumed globally, its source is usually limited and thus can be regulated, and the technology for iodization is simple and cheap. Iodization is usually done at 50–100 ppm of iodine as potassium iodate.

In regions where iodized salt is unavailable and immediate correction of iodine deficiency is necessary, supplementation with iodized oil is recommended. The main disadvantage is the need for direct contact with at-risk individuals. The preferred option for supplementation is the administration of oral iodized oil capsules. A dose of 400–960 mg iodine provides adequate coverage for one year for women of reproductive age and children ages 6–15; 200 mg iodine capsules are available for \$.18.

**Table A6: Vitamin A Prophylaxis Schedule**

Individual	Oral dose	Timing
Children 6–11 months old	55 mg retinyl palmitate (100,000 IU)	Once every 4–6 months
Children ≥ 12 months old	110 mg retinyl palmitate (200,000 IU)	Once every 4–6 months
Infants 0–6 months old	13.75 mg retinyl palmitate (25,000 IU)	1–3 times over the first 6 months of life
Women of childbearing age (mass dose)	110 mg retinyl palmitate (200,000 IU)	Within 1 month (or 2 months at most) of giving birth
Pregnant and lactating women (repeated dose)	2.75–5.5 mg retinyl palmitate (5,000–10,000 IU)	Daily

(Source: Sommer, A. 1995)

3. *Iron*. Delivering iron supplements requires attention to the quality of the tablets (frequently unattractive color, odor or taste are problems) and their packaging (improvements can prevent storage losses and enhance compliance). Supply and logistics are significant issues because of the quantity of supplements needed for preventive and curative treatment regimens. Counseling services are important complements to the provision of the supplements and service providers must be trained to motivate and educate clients about dosage schedules, possible side effects, and the need for increased dietary intake of iron. While current WHO guidelines recommend supplementing with two 60 mg iron tablets/day (see Table A7), recent studies suggest that less frequent and lower dosages may be just as effective; in the case of excessive side effects, the dosage can be reduced (McGuire, March 1994).

**Table A7: Recommended Schedules for Supplementation**

Target group	Schedule of iron and folate supplementation (Daily dose)	
	Preventive	Therapeutic
Pregnant women	1–2 tablets 60 mg iron + 250 µg folate from mid-pregnancy to term	2 tablets 60 mg iron + 250 µg folate
Infants & children < 2 yrs	2 mg iron/kg starting at 4–6 months of age	3 mg iron/kg
Low birth weight infants (< 2500 g)	2 mg iron/kg starting at 3 months of age up to 12 months of age	3 mg iron/kg
Preschool-age children	2 mg iron/kg for a 2–3 week course several times a year	3 mg iron/kg
School-age children	2 mg iron/kg for short courses several times a year	3 mg iron/kg
Adolescent girls, lactating women or other women likely to become pregnant	1–2 tablets 60 mg iron + 250 µg folate 2–4 months	1–2 tablets 60 mg iron + 250 µg folate
Other women, adolescent boys & adult men		As for previous category

(Source: Adapted from WHO/UNICEF/UNU, 1993)

#### **Appendix 4: Assessing Quality of the Data**

Any new data that are collected and analyzed or existing surveys used during project identification to look at the nutrition situation should be subjected to a number of simple questions to help with assessing the quality of the data (Kostermans, 1994).

- Is the purpose for which the survey was undertaken consistent with the manner in which the information is now being used?
- Is the data representative of the population for whom the proposed program/project is being designed? What is the source of the data (e.g. clinic, school, household), and is the source properly taken into account when survey findings are interpreted? For example, if anthropometric data are collected from health clinics and the coverage of health care in the given country is 20%, the data will not be representative of the country and should be used for national planning with reservation. Knowledge of (1) who attends the health clinic and (2) how attendance will bias the survey findings, can be used to better interpret the findings of a limited source survey.
- Is “seasonality” recognized and handled either in data collection or in interpretation? In many agriculture-based societies, food availability and consumption is closely linked to harvests and season. An anthropometric survey undertaken during the month immediately post-harvest may not represent the nutrition and food situation throughout the year. Knowledge of how seasonality influences food consumption in the given country can be used to interpret data that were not collected in all seasons.
- Is the data reported by sex and age (0–11, 12–23, 24–59, 59+ months)? Weight-for-height data might be disaggregated by height (< 85cm vs. ≥ 85cm). Is there evidence of digital preference, e.g., clumping of ages at 12 month points?

- Who were the surveyors, what type of training did they receive and what level of supervision was provided? How were standardization procedures for the measurements handled? (i.e., did all surveyors take measurements and record findings in the same way and how was this monitored?)
- What type of measuring equipment was used? Who was responsible for calibrating the instruments?
- Who was responsible for overall supervision and management of the survey? Was there a detailed operation plan?
- Are the findings consistent with other countries in the region or with countries of similar economic, climatic, and demographic characteristics?
- If more than one estimate is available, are they consistent?

## **Appendix 5: Data Sources**

1. *Demographic and Health Surveys (DHS)* works with developing country institutions to undertake national surveys to collect demographic, maternal and child health, and socioeconomic data. This USAID-funded project collects data on the nutritional status of women and children, including breastfeeding and infant feeding practices. In addition to final and summary reports of country surveys, documentation of survey methodologies, comparative studies (e.g., *Children's Nutritional Status*), and working papers (e.g., *Rural-to-Urban Migration in Bolivia and Peru: Association with Child Mortality, Breastfeeding Cessation, Maternal Care, and Contraception*) on a variety of topics are available. Nutrition chartbooks have been produced for 19 African countries. For further information, contact:

Macro International, Inc.  
11785 Beltsville Drive, Suite 300  
Calverton, MD 20705-3119.  
Tel 301-572-0200, fax: 301-572-0993  
Email: reports@macroint.com @ internet.

2. *Helen Keller International (HKI)* has worked to reduce vitamin A deficiency for more than 20 years. A variety of training manuals, teaching materials and other resources have been prepared, including *Know the Signs and Symptoms of Xerophthalmia*, *How to Use the Helen Keller International Food Frequency Method to Assess Community Risk of Vitamin A Deficiency*, and *Conducting a Qualitative Assessment of Vitamin A Deficiency: A Field Guide for Program Managers*. For further information on HKI activities and how to obtain these resources, contact:

Helen Keller International  
90 Washington Street  
New York, New York 10006  
Tel: 212 943-0890; Fax 212 943-1220.

3. *United Nations Children's Fund (UNICEF)* has country and headquarters staff working in the nutrition and health field. UNICEF formulates and implements programs in coordination with other United Nations development agencies and in close cooperation with governments in 149 countries and territories. In carrying out its activities for the benefit of children and women, the agency mobilizes the support of non-governmental organizations, community leaders and the beneficiaries themselves, and makes every effort to enlist their active participation. UNICEF has programs in immunization, oral rehydration therapy, acute respiratory infection, safe motherhood, HIV/AIDS, nutrition, breastfeeding, water/sanitation, basic education, and emergency relief.

Country Situational Analyses and 5-Year Program Plans are available from the country UNICEF office and regional offices. Further information on country programs and technical resources such as monthly technical reviews in nutrition, and Children's Summit publications, are available from headquarters at the following address:

UNICEF Headquarters; UNICEF House; Division of Information, H9F  
Distribution Unit  
3 UN Plaza  
New York, NY 10017, USA  
Tel: (212) 326 7344; Fax: (212) 326 7768

4. *UNICEF Supply Division (formerly UNIPAC)*—UN agency that provides essential drugs, including micronutrient supplements at bulk rates. For more information, contact:

UNICEF Supply Division, UNICEF Plads  
Freeport, DK2100  
Copenhagen, Denmark  
Tel: 45 35273527; Fax: 45 35269421

5. The *World Food Program (WFP)* provides food aid to developing countries both to promote economic and social development and to help allevi-

ate emergency situations. To this end, WFP's assistance, targeted to the poorest, is provided in support of a variety of government projects and emergency operations. The Program also provides food aid services to bilateral donors in the field and administers various sub-trust funds financed through extra-budgetary contributions. Resources and training material for food aid include: *Food Aid Monitor*; *Review of Food Aid Policies and Programs*; *the international food aid information system: INTERFAIS*; *WFP Weekly Emergency Situation Report*.

World Food Program  
426 Via Cristoforo Colombo  
00145 Rome, Italy  
Tel: 39 6 522821

6. *Food and Agriculture Organization (FAO)*. Since its inception, FAO has worked to alleviate poverty and hunger by promoting agricultural development, improved nutrition and the pursuit of food security—the access of all people at all times to the food they need for an active and healthy life. FAO offers direct development assistance, collects, analyses and disseminates information, provides policy and planning advice to governments and acts as an international forum for debate on food and agriculture issues. FAO has Country Representatives covering more than 100 developing countries. FAO is active in land and water development, plant and animal production, forestry, fisheries, economic and social policy, investment, nutrition, food standards and commodities and trade. It also plays a major role in dealing with food and agricultural emergencies.

Focusing on nutrition, FAO joined with the World Health Organization in setting up the December 1992 International Conference on Nutrition to re-awaken global awareness of the most basic human needs and to ensure that all people have access to the food they need for a healthy, productive life. Publications/Resources include: *Codex Alimentarius—Joint FAO/WHO Food Standards Programmes*; *Food and Nutrition Papers*; *Nutrition in Agriculture Series*; *Food, Nutrition and Agriculture Journal*.

For further information and to inquire about ICN Action Plans, World Food Surveys, Food Balance Sheets, Food Availability Trends, and other resources, contact:

Food and Agriculture Program  
Via delle Terme di Caracalla  
00100, Rome, Italy  
Tel: 39 6 52251; Fax: 39 6 5225 3152

7. *Teaching Aids at Low Cost (TALC)* provides a variety of teaching aids, books and other resources at low cost, including, *Helping Mothers to Breast-feed*, *Nutrition for Developing Countries*, *Nutrition Handbook for Community Workers*, *Child Health Charts*, *Nutrition and Child Health Flannegraph*. For further information, contact:

TALC  
P.O. Box 49  
St. Albans, Herts, AL15TX, U.K.  
Tel: 440 1727 853869; Fax: 440 1727 846852

8. *International Council for the Control of Iodine Deficiency Disorders (ICCIDD)*. The ICCIDD is a nonprofit nongovernmental organization dedicated to the sustainable elimination of iodine deficiency throughout the world. Resources/publications include: *The IDD Newsletter (quarterly)*; *ICCIDD notes*; *A Practical Guide to the Correction of Iodine Deficiency—a technical manual*; *Indicators for Assessing IDD*.

Secretariat: Dr. B.S. Hetzel  
ICCIDD Communication Focal Point:  
Tulane University School of Public Health and Tropical Medicine  
1501 Canal Street, Suite 1300  
New Orleans, LA 70112  
Tel: 504 584-3542; Fax: 504 585-4090  
email: tcihd@mailhost.tcs.tulane.edu

9. The *International Vitamin A Consultative Group (IVACG)* is dedicated to reducing the prevalence of vitamin A deficiency worldwide. IVACG analyzes issues related to the etiology, treatment and prevention of vitamin A deficiency by working with scientists, programmers and policy makers. IVACG provides a forum for new ideas, encourages innovations, recognizes important research findings, increases awareness of the latest information, and promotes action programs through a variety of mechanisms. Resources and materials from IVACG include: *A Brief Guide to Current Methods of Assessing Vitamin A Status*; *Guidelines for the Development of a Simplified Dietary Assessment to Identify Groups at Risk of Inadequate Intake of Vitamin A*; *Methodologies for Monitoring and Evaluating Vitamin A Deficiency Intervention Programs*; *Nutrition Communications in Vitamin A Programs: A Resource Book*; *Vitamin A Supplements: A Guide to Their Use in the Treatment and Prevention of Vitamin A deficiency and Xerophthalmia*. For further information on IVACG, contact:

The IVACG Secretariat, ILSI  
1126 16th Street, N.W., Suite 200  
Washington D.C. 20036  
Tel: 202 659-0789; Fax: 202 659-3617

10. The *International Nutritional Anemia Consultative Groups (INACG)* mission is to create world-wide awareness of the problem of nutritional anemia (particularly as it affects women and children), and to promote appropriate interventions at the regional and national levels. It does this by providing scientific leadership, building creative partnerships among governments, industry, donors, and NGOs and by serving as a forum for discussion on critical issues concerning program implementation. Resources/materials include: *Iron EDTA for Food Fortification*; *Combating Iron Deficiency Anemia Through Food Fortification Technology: An Action Plan*; *Guidelines for the Control of Maternal Nutritional Anemia*. For further information, contact:

INACG Secretariat, ILSI  
1126 16th Street, N.W., Suite 200  
Washington D.C. 20036  
Tel: 202 659-0789; Fax: 202 659-3617

11. The *WHO/Micronutrient Deficiency Information System (MDIS)* is a global surveillance mechanism for continually assessing the magnitude and distribution of deficiencies in iodine, vitamin A and iron. The database provides the information required both to estimate the prevalence and magnitude on a national and global scale and to provide timely and direct support for implementation and monitoring related prevention and control programs. Several working papers have been prepared. More information is available from:

MDIS, WHO, Nutrition Unit  
1211 Geneva 27  
Switzerland  
Tel: 41 22 791 3318; Fax: 41 22 7914156

12. *The Micronutrient Initiative (MI)* was established in 1992 as an international secretariat within the IDRC in Canada by its principal sponsors: Canadian International Development Agency, International Development Research Center, USAID, United Nations Children's Fund, United Nations Development Programme and The World Bank. The mission of the MI is to strengthen, expand, and accelerate operational programs to eliminate iodine deficiency disorders and vitamin A deficiency and to reduce by one-third the anemia in women, all goals of the World Summit for Children. While addressing all available approaches, the focus is on sustainable interventions, with fortification of commonly eaten foods with essential micronutrients as the centerpiece of MI's efforts. The following resources are available from MI: *Vitamin A Key Resources*; *Technical Manual on Salt Iodization*; *Salt Monitoring Kit*; *Food Fortification State of the Art Manual*. For additional information, please contact:

The Executive Director, The Micronutrient Initiative  
c/o International Development Research Center  
P.O. Box 8500, Ottawa, On K1G 3H9 Canada.  
Tel: 613-236-6163 Ext 2118; Fax: 613- 238-7230  
Internet: TGUAY@IDRC.

13. The *Administrative Committee on Coordination/Subcommittee on Nutrition (ACC/SCN)* is the focal point for harmonizing the policies and activities in nutrition of the UN system. The SCN carries out a range of activities aimed at reducing malnutrition primarily in developing countries, including sponsoring working groups on intersectoral and sector-specific topics. It compiles and disseminates information on nutrition; *Updates on the World Nutrition Situation, State-of-the-Art papers and SCN News* are routine publications of the ACC/SCN. Information can be obtained by contacting:

Technical Secretary ACC/SCN  
c/o WHO Headquarters  
Avenue Appia, 20  
CH-1211 Geneva 27, Switzerland  
Tel: 41-22-791-0456 Fax: 41-22-798-8891  
email: ACCSCN@WHO.CH