The following box outlines the basic steps in economic analysis. The last three are often given most attention in “how to” guidelines and this is understandable given their greater technical complexity. But the earlier stage is no less important. In fact, the appropriateness and efficiency of the analysis itself depends crucially on getting these first steps right.

The basic steps:

- Specify the problem and define the objectives of the project in relation to that problem
- Identify all plausible options for achieving those objectives
- Decide what level of analysis is worthwhile
- Describe in detail the options being considered
- Estimate the costs of each option
- Estimate the benefits or effectiveness of each option, based on the projected demand
- Analyze the relationship between costs and benefits (or effectiveness) for each of the options being considered.

Problem and objective definition

The principal objective largely determines the analytical approach used. The “objective” is expressed in terms of some specified reduction in a defined problem. This might be a nutrition problem (e.g. vitamin A deficiency is high, malnutrition in children has increased), or a technical or administrative one (e.g. iodine levels in fortified salt appear to be too low, the supplementation
program is not working as well as hoped, there is insufficient nutrition expertise available). It may be a broader health or welfare concern (e.g. mortality rates are high). The more precisely defined the objective, in terms of population and geographic targets and timetable (e.g. “to reduce by 50% the level of vitamin A deficiency in young children in rural areas of Guatemala by the year 2000”), the easier the subsequent steps in an economic appraisal will be.

Built into the declaration of the objective of a project is a judgement that that objective is worth meeting. Sector level economic analysis should have determined this before the project appraisal stage, but it may be appropriate to question that assumption, open up the issue and redefine the problem. If support for that judgement is not solid, there may be good grounds for recommending that project resources be invested in further analysis or research to provide more convincing evidence to guide future decisions and help mid-course corrections to project implementation.

**Identification of alternatives**

While disease and inadequate dietary intake both contribute to malnutrition, “nutrition” projects traditionally focus on rectifying the problem of inadequate or inappropriate intake (e.g. premature feeding of liquids to young infants). In general terms, there are three important broad routes through which dietary intake can be improved—changing “tastes” (preferences, habits, values), changing the price to consumers of foods or food inputs to consumers (fortified foods, food supplements, materials for home gardening etc.) and changing the resources (income) available to procure appropriate food in adequate amounts.

Governments can influence the first directly through “information, education and communication” for the targeted population. This can be done indirectly by training those outside government service or regulating their educational activities. The second can be accomplished by fully funding, subsidizing, or requiring through legislation and regulations that someone else provide those foods or food inputs (e.g. food fortification regulations). The third can
be influenced through income transfers (e.g. food stamps). There may be interactions among these (e.g. income transfers may influence prices and/or “tastes”). Also, less direct ways may be used, such as through education and agricultural policies.

In considering the alternative ways to ameliorate the defined nutrition problem, it pays to be creative and cast a wide net in the first instance. Involve technical specialists to canvas the options as broadly as possible. Consider the different routes through which change could be effected and whether the problem is best tackled through interventions in the health, agriculture or education sectors; which mix of inputs (more food or education, training or quality assurance techniques) is key; whether or how much targeting to undertake (by age, income or location); what technologies or delivery systems to use; and the optimal scale of operation. Consider the possible instruments for affecting that change (direct provision, subsidies, regulation) and alternative providers and implementing agencies including those in the private as well as the public sector. Labor is often the largest cost component, and exploring alternative ways to use this resource more efficiently is a relevant cost-effectiveness issue for most nutrition programs.

In practice, the choices within some of these dimensions will be quite limited for some interventions, and certain issues will emerge as more important for a given intervention. Some choices will be clearly less efficient than others on the basis of a rough assessment of likely cost and effectiveness. Others might fail to satisfy some absolute constraints (e.g. financial, technical, legal, cultural or ethical). These options should be recorded and the reasons for not considering them further noted. It is important not to eliminate from the list any alternatives which have powerful political support.

Three micronutrient problems illustrate the kinds of differences in issues and choices that are likely to emerge. The problem of vitamin A deficiency, for example, can be tackled in three very different ways: fortification of food vehicles, periodic distribution of high dose capsules (supplements) or education to encourage the consumption of vitamin A-rich foods. The demand
for existing supply of each of these will vary and will form a basis for the analyses. Which strategy, or mix of strategies, is preferable will not be immediately obvious in most cases and can usefully be subjected to cost-effectiveness analysis (see Case Study 1).

Iron deficiency in pregnant women, on the other hand, can only be addressed through supplements—the iron needs of pregnant women exceed any safe level of population-wide food fortification and naturally rich food sources of iron do not provide enough. Cost-effectiveness analysis can, however, be used to explore the alternative ways in which supplementation can be implemented. Important issues, for example, include the role of screening and the magnitude of public sector subsidies for social marketing and supplements (see Case Study 2).

Among options for iodine deficiency control, there is usually no viable alternative to iodizing salt; injections are more costly and complex and are used as a stop-gap emergency measure only. Within the broad strategy of salt iodization, a number of alternative approaches are possible. One is how to encourage small salt producers to produce iodizable quality salt, whether through subsidies or through penalties against un-iodized salt, which would drive some salt producers out of the market. Another is the appropriate balance of investment in demand generation through public education, and in a regulatory and monitoring system.

Where the question being posed is “should we continue this nutrition project as it is or in some modified form” analysis of the existing project is likely to be an important source of ideas about suitable alternatives. Case Study 2 illustrates this approach as applied to an iron supplementation program in Jamaica.

Public/private question

One of the key sets of alternatives that must be considered concerns the nature and extent of public sector involvement. Governments can play a
variety of roles. They may act as providers of goods or services which can be financed through taxation or user fees. Alternatively, governments may contract out services to the private sector or provide other incentives to modify private provider behavior through regulations or pricing policies or by directly subsidizing some inputs such as information or training.

Cost-benefit or cost-effectiveness analysis will not answer the question of whether government involvement is appropriate or not. An attractive economic return does not necessarily justify public involvement. Indeed, if the net financial returns are also positive it suggests that the project be left entirely or largely to the private market (Devarajan, et al, 1996).

Government involvement can generally be justified where there are identifiable failures in the market, which arise in the case of public goods, externalities and imperfect information, or where income redistribution is considered desirable. Where government involvement is justified, the Bank has favored government finance (as opposed to government provision of goods and services). One reason for this is that public sector institutions have often been found to operate less efficiently than those in the private sector, and attempts to improve their performance have generally been unsatisfactory.

Undertaking a detailed analysis of all the private/public alternatives is not necessary. Some will be clearly inappropriate. The best procedure is to start by identifying the rationale for public involvement and explore what this might mean for an appropriate government role. In nutrition, there are few examples of pure public goods or of market failure arising from externalities or indivisibilities. Many of the benefits from improved nutrition are private benefits, captured by the individual and her/his family (Levin, 1985). Much of the rationale for public involvement in nutrition will revolve around market failure resulting from imperfect information (Behrman, 1995) and the desire to redistribute income to poorer members of society. If information failure is the rationale, it may be worth investing in education, communications and research (including basic research to improve understanding of intervention benefits, as well as monitoring epidemiological trends in deficiencies) rather
than free provision of subsidies for goods and services. If equity is the rationale for public financing, then income incidence of benefits needs to be looked at very closely.

Since full cost recovery will rarely be a desirable goal for those nutrition projects which do have a convincing public sector rationale, it is important that appraisals include the cost of distortions created by financing projects through taxation. The marginal cost of public funds is an additional and substantial cost incurred by the project. For every dollar in additional taxation that is required, distortionary costs have been estimated to lie in the range of 20 cents to one dollar, depending in part on the tax instrument employed (Devarajan, et al, 1996).

**Level of analysis**

Economic appraisal is not an “all or nothing” exercise. It can be done more or less thoroughly and comprehensively and should itself be subjected to some level of economic assessment. It is important not to fall into the trap of holding “modest decisions hostage to elaborate manipulations of data” (Field, 1987). On the other hand, failure to devote adequate attention to assessing the options and their implications can have costly consequences. For example, failure to adequately assess the expected costs, benefits and demand for routine hemoglobin testing in Jamaica has resulted in an unnecessary drain on scarce health resources (see Case Study 2).

In deciding how much time and money to invest in the analysis, the following should be considered:

- the possible losses from making a wrong choice
- the nature of the available data and the likely costs of different levels of complexity of the analysis
• the amount of influence the analysis is likely to have (both for this decision and others)

• the type, level of detail and presentation of data that is suitable for the study’s audience

The general principle is to do the minimum necessary to answer the question being posed. The analysis only need be as precise and sophisticated as is necessary to decide to accept or reject a project. Clearly identifying what is known about cost, or effectiveness or their component parts, and what can be used “as is” with minimal adaptation, and what data will need to be specially collected, is key to being efficient in the appraisal process. Another strategy is to focus data collection and analysis on those elements that are likely to contribute most to costs or benefits, such as the cost of fortificant in the vitamin A fortification program in Case Study 1.

**Description of the alternatives**

An important step before embarking on the estimation of costs and benefits or effectiveness is to delineate as precisely as possible exactly what it is that is being appraised. Part of the reason for doing this is to make sure that the cost and effectiveness estimates match, that what is being costed is really the intervention whose effectiveness is being estimated. Size, time horizon and perspective are important dimensions to define.

A societal perspective is generally appropriate for donors such as the Bank and is the perspective adopted in most of this document. It implies being comprehensive in the measurement of costs and benefits. Different parties involved, for example, government ministries and consumers will have different viewpoints. It is often useful to also calculate the costs and benefits they will experience, in order to understand the nature of the incentives or disincentives to their participation. This is particularly true of the potential
beneficiaries of the project. The costs and benefits they perceive will
determine the level of their demand for the project outputs and hence
project effectiveness.

If the intervention is a discrete, time-limited one, the analysis should be on
the whole of the project, over its lifetime. If the intervention is long-term,
indefinite and relatively stable, a more manageable short-cut might be to
define the intervention in terms of one year and estimate the effectiveness of
resources employed in that typical year.

Immediate project outputs are often the pivot around which estimates are
derived. For example, in a food distribution program, the cost exercise
might involve estimating the cost per kilogram of food delivered per benefici-
ary per year, while the effectiveness calculations will involve estimating how
a kilogram of food per beneficiary per year will translate into a reduction in
mortality. It is important to ensure that the link is secure. It would not be
appropriate for the costs to refer to food delivered for example, while effec-
tiveness is based on food consumed.

Consistency in approach between interventions is also an important princi-
ple. For example, if a “typical” year is being used, the approach should be
comparable for different interventions. It would not be legitimate, for exam-
ple, to study an early start-up year, probably with high costs and poorer
effects, for one project and a year when the program is well-established for
another (see Case Study 4). Consistent assumptions regarding key eco-
nomic and epidemiological variables, such as discount rates, exchange
rates and mortality rates, should be employed across the interventions. The
perspective adopted should be the same for each intervention.