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1129 20th Street, NW
Suite 801
Washington, DC 20036
(202) 466-3318
FAX (202) 466-3328

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**GUIDELINES FOR SECTORAL
FOOD AND NUTRITION POLICIES
IN HEALTH, AGRICULTURE AND
EDUCATION**

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GUIDELINES FOR SECTORAL FOOD AND NUTRITION POLICIES IN THE COUNTRIES OF LATIN AMERICA AND THE CARIBBEAN

INTRODUCTION

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José O. Mora, MD

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University Research Corporation/International Science & Technology Institute
7200 Wisconsin Avenue, Suite 600
Bethesda, MD 20814*

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I. UNDERNUTRITION, STILL A SIGNIFICANT PROBLEM IN LATIN AMERICAN AND CARIBBEAN COUNTRIES

Despite significant progress in many countries, household food insecurity, energy-protein malnutrition (EPM) and micronutrient deficiencies of young children and mothers continue to be major obstacles for sustained social and economic development in many countries of Latin America and the Caribbean (LAC), particularly in Agency for International Development (USAID) child survival emphasis countries (see Tables 1-3). In the LAC region as whole, national per-capita energy supplies improved from 2370 per day in 1961/63 to about 2710 in 1989/90. Regional prevalence rates for global malnutrition (low weight-for-age) declined from about 17% in 1975 to 11% in 1992; improvement was more marked in South America (from 15.7% to 8.2%) than in Central America/Mexico (from 19.3% to 16.4%, as seen in Table 1).

However, most of the positive change in child malnutrition and energy supplies occurred before the 1980s, with slower gains, if any, in the last decade. The United Nations estimates that if the trend of improvement in the 1970s in South America were restated in the 1990s, underweight rates in children would be eliminated before the end of the century (United Nations, 1992). The problem seems to be somewhat more resilient in Central America, where more effective targeting of nutrition programs and special efforts to reach out to remote communities and to the poor would be required. All of this has occurred within a socio-economic and political context in which the majority of countries, with democratic systems, are struggling to recover at least the rates of sustained economic growth which they experienced prior to the "lost decade" of the 1980s (see Table 3). At the same time, the countries face growing social problems which have been exacerbated by the short-term impact of the structural adjustment policies that have forced them to direct priority attention to social development and poverty eradication using, insofar as possible, subregional strategies of social integration.

LAC HNS estimates (Mora & Wickham, 1994) based on most recently available national data indicate that 5.7 million children (11.3%) in the LAC region suffer from global malnutrition (16.6% in Central America/Mexico and 8.2% in South America), whereas 10.9 million or 21.8% are stunted (26.5% in Central America/Mexico and 18.7% in South America). At least one out of three or four children under five years of age is malnourished in Guatemala, Haiti and Honduras, and at least one of two or three is stunted in Bolivia, Ecuador, Guatemala, Haiti, Honduras, and Peru (see Table 2). Population-weighted prevalence rates in the nine USAID child survival emphasis countries¹ amount to 18% (underweight) and 37% (stunting), respectively.

¹ Bolivia, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Peru and the Dominican Republic.

TABLE 1
Prevalence and Number of Underweight Children in the LAC Region, 1975-1992

	1975	1980	1992
Central America & Caribbean/Mexico			
Percent prevalence	19.3	17.7	16.6
Million children	3.4	3.1	3.1
South America			
Percent prevalence	15.7	9.3	8.2
Million children	4.8	3.1	2.6
Total LAC Region			
Percent prevalence	17.0	12.2	11.3
Million children	8.2	6.2	5.7

Sources: United Nations, 1992; De Onis et al., 1993; LAC HNS files.

Breastfeeding rates have been declining in a number of LAC countries as a result of multiple forces including urbanization, women's work, medical/hospital health care practices and the marketing of breast milk substitutes, although some modest improvements have been recently reported (Sharma et al., 1990; Pérez-Escamilla, 1993). Perhaps more important, duration of exclusive breastfeeding, which is critical to take full advantage of the health and nutrition benefits of breastfeeding, remains low, even in countries where total duration is relatively long. The proportion of children 0-4 months exclusively breastfed found in the Demographic and Health Surveys (DHS) recently conducted in nine LAC countries ranged from less than 1% to more than 55%, with estimated median durations of only 0.2 to 1.1 months (Sharma et al., 1990; Pérez-Escamilla, 1993). Between 46% and 75% of children 0-5 months are bottle-fed.

There are no data available on national trends in the prevalence of low birth weight (LBW), an indicator of intrauterine growth retardation, which is to a great extent attributable to inadequate nutrition before and during pregnancy. Modest improvements have been reported, from 15% to 12% in Central America and from 12% to 10% in South America (United Nations, 1992). Poor maternal nutrition remains a significant problem in a number of countries, as indicated by weight-for-height, dietary intake and weight gain during pregnancy, and iron deficiency anemia is highly prevalent. Recent estimates of the rate of LBW are higher than 10% in Bolivia, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico and Nicaragua (World Food Council, 1992).

TABLE 2
Prevalence (%) of Global Malnutrition (Low Weight for Age) and Stunting (Low Height for Age)
Among Children Under 5 in Latin America and the Caribbean¹

Country	Under 5 Population (millions)	Year	Weight/Age (% < 2 SD)	Height/Age (% < 2 SD)	Wt/Age (thousands)	Ht/Age (thousands)
Argentina	3.2	-	-	-	-	-
Bolivia	1.1	1989*	13.3	38.3	146.3	421.3
Brazil	17.2	1989	7.0	15.4	1204.0	2648.8
Chile	1.5	1994**	0.9	2.7	13.5	40.5
Colombia	3.9	1989	10.1	16.6	393.9	647.4
Costa Rica	0.4	1990**	2.8	7.8	11.2	31.2
Dominican Republic	1.0	1991	10.4	19.4	104.0	194.0
Ecuador	1.5	1986	16.5	34.0	247.5	510.0
El Salvador	0.8	1993	11.2	22.8	89.6	182.4
Guatemala	1.7	1990*	38.5	57.9	654.5	984.3
Guyana	0.1	1987	24.3	-	24.3	-
Haiti	1.0	1990	33.9	40.6	339.0	406.0
Honduras	0.9	1994	21.0	39.6	189.0	356.4
Jamaica	0.3	1990	6.9	8.7	20.7	26.1
Mexico	11.7	1988	13.9	22.3	1626.3	2609.1
Nicaragua	0.7	1993	11.9	23.7	83.3	165.9
Panama	0.3	1992	7.1	9.4	21.3	28.2
Paraguay	0.7	1990	3.7	16.6	25.9	116.2
Peru	2.9	1991	10.8	36.5	313.2	1058.5
Uruguay	0.3	1989**	6.5	14.6	19.5	43.8
Venezuela	2.5	1992**	8.2	17.0	205.0	425.0
TOTAL	53.7		11.3	21.6	5732.0	10,895.1

¹ Most recent data. Sources: United Nations, 1992; De Onis, et al., 1993; LAC HNS files.

* = Demographic and Health Surveys, 3-36 months.

** = Health services

TABLE 3
Basic Socioeconomic Indicators for Countries of Latin America and the Caribbean

Countries	Estimated population (millions) 1993 ¹	Under 5 mortality 1993 ¹	Infant mortality 1993 ¹	Calorie availability per capita 1989-1992 ²	GNP per capita US\$ 1992 ¹	Percentage growth rate of GNP 1965-80	Percentage growth rate of GNP 1980-92 ¹	Human development index 1992 ³
Argentina	33.5	27	24	3,103	3,970	1.7	-0.9	0.853
Bolivia	7.7	114	78	2,000	680	1.7	-1.5	0.530
Brazil	156.6	63	52	2,736	2,920	6.3	0.4	0.756
Chile	13.8	17	15	2,565	2,360	0	3.7	0.848
Colombia	34.0	19	16	2,473	1,250	3.7	1.4	0.813
Costa Rica	3.3	16	14	2,711	1,870	3.3	0.8	0.848
Dominican Republic	7.6	48	40	2,310	940	3.8	-0.5	0.638
Ecuador	11.3	57	45	2,402	1,010	5.4	-0.3	0.718
El Salvador	5.5	60	45	2,313	1,090	1.5	0	0.543
Guatemala	10.0	73	53	2,261	980	3.0	-1.5	0.564
Guyana	0.8	63	47	2,454	330	-	-	0.580
Haiti	6.9	130	85	1,995	370	0.9	-2.4	0.354
Honduras	5.6	56	43	2,246	590	1.1	-0.3	0.524
Jamaica	2.5	13	11	2,549	1,380	-0.1	0.2	0.749
Mexico	90.0	32	27	3,037	3,080	3.6	-0.2	0.804
Nicaragua	4.1	72	51	2,212	340	-0.7	-5.3	0.583
Panama	2.6	20	18	2,256	2,130	2.8	-1.2	0.816
Peru	4.6	34	28	2,675	1,270	4.1	-0.7	0.679
Paraguay	22.9	62	43	1,955	1,070	0.8	-2.8	0.642
Uruguay	3.1	21	19	2,690	2,880	2.5	-1.0	0.859
Venezuela	20.6	24	20	2,660	2,720	2.3	-0.8	0.820

¹ State of the World's Children, UNICEF, 1995.

² World Food Day Report, USAID, 1993.

³ Report on Human Development, UNDP, 1994.

According to the 1993 World Food Day Report (USAID, 1993) based on 1989-1994 averages of five indicators (GNP per capita, average daily per capita calorie availability, under-five mortality rates, gross foreign exchange earnings, and gross domestic food production), four LAC countries are among the most food insecure (Haiti, Bolivia, Nicaragua and Peru) and four more are borderline (Honduras, Dominican Republic, Guatemala and El Salvador). Hence, there is not enough food in these countries, even if it were equally distributed, to ensure each person access to sufficient calories.

Household food insecurity also affects variable proportions of the population in relatively food secure countries. Aggregated national figures, however, typically hide large disparities between socio-economic strata and regions. Frequently, the problem tends to cluster in certain population groups. The 1993 World Food Day Report assessed trends in the same five indicators over the past several years: two countries of the region experienced clear progress (Colombia and Mexico), six showed some progress (Bolivia, Brazil, Costa Rica, Jamaica, Paraguay, and Suriname), there was no clear change in nine countries, and there was some deterioration in Haiti.

Sub-clinical micronutrient deficiencies of iron, vitamin A, iodine and others persist as public health problems with significant functional implications in a large number of countries. The distribution and other epidemiological characteristics of micronutrient deficiencies often differ from those of EPM, as do effective approaches to solve them. Given the marginal nature of vitamin A deficiency (obvious clinical signs of deficiency are less common than in other regions), awareness of the significant magnitude of the problem and its developmental consequences did not exist until recently and thus remained for the most part unattended.

Recent assessments have shown vitamin A deficiency to be a significant public health problem country-wide in El Salvador, Nicaragua, Guatemala, the Dominican Republic, Honduras, Ecuador and Belize, and very likely in Haiti and Peru, as well as in certain regions or population groups in Brazil, Mexico, Bolivia and Panama (Mora & Dary, 1995). Iron deficiency and anemia are widespread in the region; close to 100 million or almost one fourth of the population are affected, including above 60% of children under two years of age and 40% of all pregnant women; very little is done to control and prevent it. Despite significant progress, iodine deficiency persists as a public health problem in some countries (Peru, Paraguay, El Salvador, Guatemala, Panama) and in limited areas in most other countries, with an estimated 63 million (14.2%) affected (WHO, 1993).

At both the World Summit for Children in 1990 and the International Conference on Nutrition (ICN) in 1992, LAC countries made a firm commitment to formulate national plans of action and pledged to make all efforts to eliminate iodine and vitamin A deficiency and to substantially reduce undernutrition and other important micronutrient deficiencies, including iron deficiency, before the end of the decade. The most important nutritional goal for the year 2000 is to reduce the prevalence of moderate to severe undernutrition among children under five years to half of the levels found in 1990. Other goals to support this overall goal include:

- Reduce the prevalence of low birth weight to less than 10%.
- Reduce by one-third the levels of iron-deficiency anemia among women.
- Virtually eliminate iodine and vitamin A deficiencies and their sequelae.
- Institutionalize growth monitoring/promotion in all countries.
- Exclusive breastfeeding for all infants up to four to six months of age, and partial breastfeeding for as long as possible in the second year.
- Higher levels of local food production to guarantee household food security.

In the International Conference on Nutrition in 1992, the LAC countries signed the Declaration and Nutrition Action Plan in which the commitments and goals set in the World Summit for Children were ratified and nine nutrition and food security strategies outlined:

- Incorporation of nutritional objectives, considerations and components in development policies and programs.
- Improvements in household food security.
- Consumer protection through improvements in the quality and safety of foods.
- Prevention and nutritional management of infectious diseases.
- Promotion of breastfeeding.
- Priority attention to socially and economically disadvantaged and nutritionally vulnerable groups.
- Prevention and control of micronutrient deficiencies.
- Promotion of adequate diets and health lifestyles.
- Evaluation, analysis and surveillance of food and nutritional status.

In line with the first strategy, the incorporation of nutritional objectives in health, agriculture and education policies and programs is both relevant and timely. The majority of LAC countries have prepared or are in the process of preparing national plans of action in nutrition.

If the goals established for the year 2000 are to be met, such plans should encompass the formulation and effective implementation of specific sectoral nutrition policies and programs,

with the necessary political and financial support. The guidelines for sectoral nutrition policies presented here are intended to facilitate the decision-making process for sectoral nutrition policy formulation and implementation to meet the ICN goals in the LAC region, with particular attention to USAID child survival emphasis countries.

These guidelines are designed to aid those who are charged with incorporating, implementing and evaluating nutritional objectives in the development of sectoral policies. They may also be useful for wider application by those responsible for achieving such nutritional objectives by effectively coordinating sectoral policies and strategies.

Policy development can be conceptualized as encompassing four processes: policy assessment, analysis, advocacy, and decision-making (see Figure 1). Ideally, the formulation of policies and the implementation of activities derived from them would constitute an interactive process, whereby the monitoring of policy implementation would yield technical and social inputs for ongoing policy analysis. Decision-making about policies may be based on the results of "objective" analyses, although more frequently is determined by the effectiveness of policy advocacy and the political strength of those promoting specific policies. The interactions between policy analysis, advocacy, and decision-making are critical, and the guidelines presented here are designed especially for the actors involved in these three processes (see Table 4).

The implementation of policies in the form of concrete actions (programs and projects) is carried out at the central, regional and community levels, involving a myriad of different actors. The overlap between the development and implementation of policies implies the participation of these different actors in the policy development processes. It is therefore critical that: (a) nutritional goals and objectives be adequately reflected in the operational design of policy actions; (b) the most effective and efficient actions be implemented to achieve nutritional goals and objectives; and (c) nutritional goals and objectives realistically take into account the technological, operational, social and political constraints of each policy option. Consequently, these guidelines should also respond to the needs of decision-makers at the local and community levels. While there has been an attempt to anticipate such needs in the preparation of these guidelines, field-testing of the guidelines should include a needs assessment of operational and methodological inputs to policy development at the local and community levels so that future revisions to the guidelines could best take such needs into account.

FIGURE 1

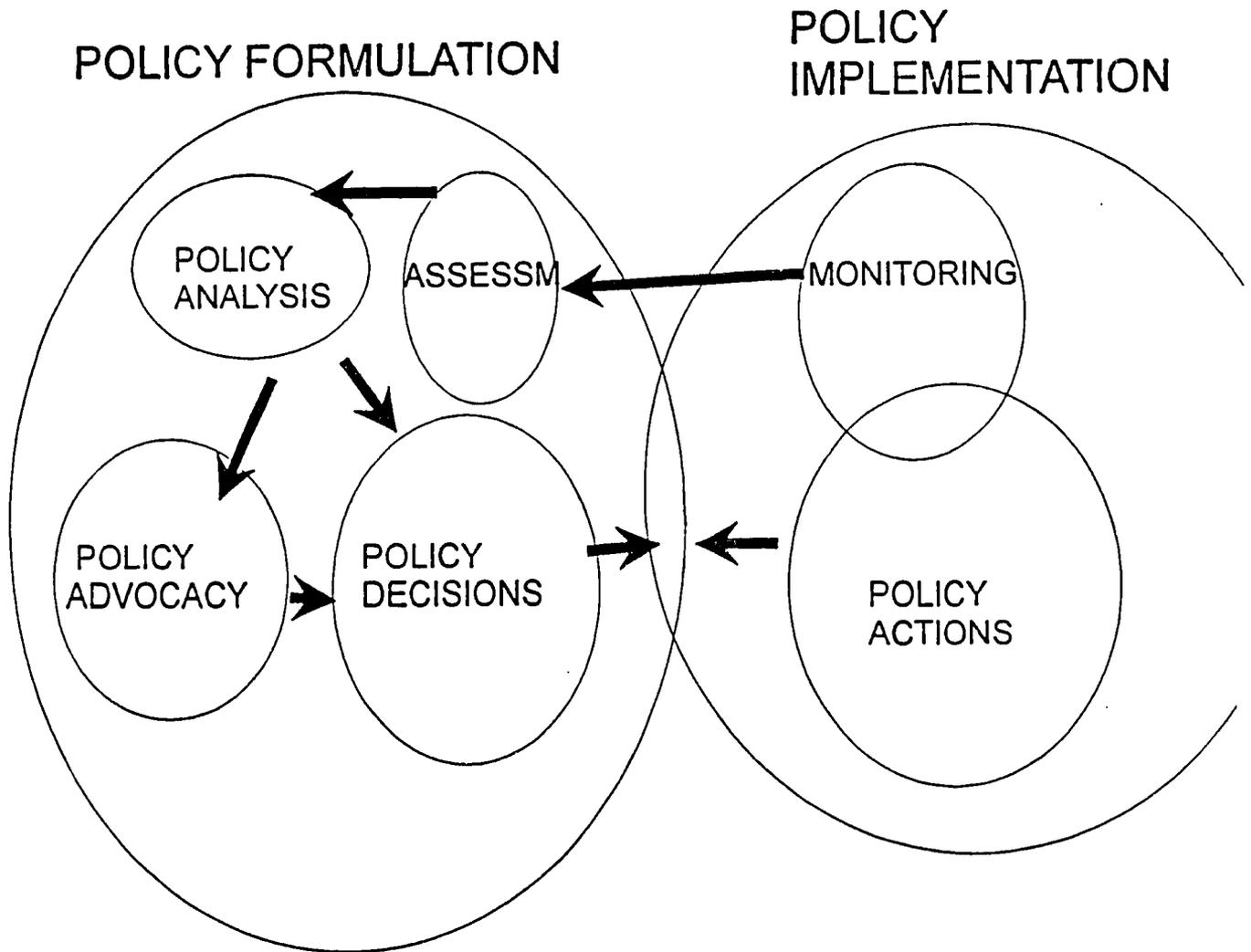


TABLE 4
Key Actors in the Policy Development Process

PROCESS	ACTORS
1. Policy Analysis	Planners Researchers Non-governmental Organizations
2. Policy Advocacy	International Donor and Technical Assistance Agencies Special Groups: - Professional Associations - Consumer Groups - Non-governmental Organizations - National Organizations Private Sector Companies, Associations
3. Policy Decision-making	Members of the Legislative Body Members of the Executive Body
4. Assessment	Technical Personnel: - National Statistics Office - Central Planning Office - Ministries - Non-governmental Organizations
5. Policy Actions	Technical, Operational and Management Personnel: - Ministries - Non-governmental Organizations Local Authorities Community Groups
6. Monitoring	Technical Personnel at the Local Level: - Ministries - Non-governmental Organizations - Local Authorities - Development Projects Community Groups

II. RATIONALE FOR INVESTING IN NUTRITION

It is now recognized that nutrition is both a critical input to social and economic development and a long-term outcome of it. The economic rationale for investing in nutrition stems from the social and economic implications of malnutrition, as well as from the significant pay-offs obtained from nutrition investment.

There is abundant evidence on the substantial negative economic implications of poor nutrition in developing countries. Mechanisms include increased risk of morbidity and mortality, generating greater financial costs to the health care system, decreased physical growth and endurance leading to reduced labor productivity and wages, and retarded cognitive and psychomotor development conducive to poor learning capacity and school performance, lower rate of return from investments in education and reduced adult labor productivity and income. The additional health expenditures needed to address the excess morbidity associated with nutritional deficiencies is a large burden for health systems already facing financial constraints (World Bank, 1993).

The additional costs to the educational system of primary school failure (repetition, attrition) associated with poor nutrition, including iodine deficiency and the impact (likely to be irreversible) of iron deficiency anemia in early childhood on mental development, are also significant. The economic implications of reduced physical endurance and labor productivity and of increased morbidity in the poorest segments of the population are staggering. Overall, poor nutrition is responsible for a large burden of disability-adjusted life-years (DALYs) in the population of many LAC countries, with enormous costs in terms of excess health care expenditures and lower labor productivity.

The economic implications of nutritional deficiencies for a country and, particularly, for the public sector, in terms of excess health care costs, inefficiency of investments in health and education and diminished overall economic productivity, and for the individual in terms of reduced labor income and increased health care costs, highlight the enormous costs of not acting. If further nutritional improvement is not fostered in the LAC region, not only the quality of life will be affected but the significant gains in child survival so far achieved are likely to slow down; likewise, replacement mortality may in the long term diminish the mortality reduction effects of child survival interventions.

An important indirect effect from investing in nutrition consists of enhancing the impact of other investments, such as those in health and education. By investing effectively in nutrition, in addition to reducing human suffering, a substantial proportion of the additional financial burden to the health system resulting from malnutrition-related excess morbidity could be removed and the savings in health care costs can eventually be used to meet other pressing health needs, including increased coverage of child survival interventions. Also, better nutrition increases the efficiency of investments in education by improving cognitive development, learning capacity and school performance. Greater efficiency of health and education investments, in turn, will lead to further nutrition improvement.

As Behrman (1992) contends, investing in nutrition is also an effective and efficient means of achieving the broad goals of development, namely increasing productivity to expand consumption of goods and services, and improving equity, that is, distributing those goods and services as evenly as possible among members of society. Investments in nutrition contribute to the productivity goal of economic growth and development directly through increased labor productivity, and indirectly through enhanced cognitive achievement, which ultimately translates into improved school performance and adult labor productivity (Levinger, 1992).

Investments in nutrition also contribute to the equity goal through immediate improvements in consumption among the poorest groups from targeted resource transfers (e.g., primary health care and nutrition services), and also because the effects of increased productivity from better nutrition tend to accrue disproportionately to the poor through higher labor income in the labor market economies of most LAC countries. Micronutrient intervention programs, in particular, dramatically enhance productivity, education, overall health and child survival and, by increasing the returns from investments in sectors such as health, education and agriculture in a magnitude that greatly exceeds their cost, they represent cost-effective and sound investments (Sanghvi, 1993).

In summary, the social and economic implications of not acting are too serious to be afforded by a developing society. Cost-effective solutions with high economic returns are available. In addition to the humanitarian rationale, investing in nutrition is arguably an efficient use of development resources. Not only do nutrition improvements generate significant savings to the health care system and translate into higher productivity through enhanced human capital, but investments in nutrition serve to increase the productivity and social benefits of other socioeconomic investments and contribute to the pursuit of economic growth with equity, as the poorest groups received the greatest benefit. Nutrition as an input to development plays a catalytic effect, increasing the returns on investments in agriculture, education and health, and significantly contributing to improving a country's human capital and social and economic development, of which improved nutrition is a critical outcome.

III. CURRENT NUTRITION ACTIVITIES IN THE REGION

A variety of nutrition programs and interventions are currently being implemented in most LAC countries, including supplementary feeding programs (sometimes in conjunction with growth monitoring and health/nutrition education), breastfeeding promotion measures, micronutrient supplementation and fortification, and some nutrition education. Food and nutrition surveillance systems have been designed and implemented partially in some countries. Efforts have also been made to integrate nutrition interventions within primary health care.

Many countries are engaged in a process of restructuring their health systems, with emphasis on: decentralization; social mobilization; community participation; the development of

integrated local health systems; the privatization of health care; the integration of health promotion and health care; strengthening management capacity and the efficiency of public sector spending and program effectiveness; and, in some cases, intrasectoral coordination and a redefinition of the functions of the Ministry of Health. Moreover, processes of subregional social integration are also underway, especially in Central America, and in some cases, efforts are being made to address the problem of food security in a multidisciplinary and intersectoral way. The process of Central American integration, for example, seeks sustainable development and combatting poverty as critical elements of social and economic development. However, supplementary feeding continues to be by far the most visible, and in some cases, practically the only nutrition intervention implemented on a large scale in most countries, to the extent that it is often referred to as "the nutrition program" (Musgrove, 1991). More recently, food subsidy and targeted "coupon" programs for income transfer or "food-coupon" programs have been promoted as potentially effective means to improve food security/consumption of vulnerable groups while avoiding the logistic burden involved in direct food distribution.

The number of supplementary feeding and food subsidy programs increased notably in countries of the LAC region in the 1980s. In an inventory and critique of such programs prepared by the World Bank (Musgrove, 1991), 104 food distribution programs were identified in 19 countries, with a total cost of US \$1.6 billion (including the estimated market value of the donated food commodities). Of these programs, 53 were maternal and child health programs managed by or associated with health care delivery institutions, 23 were school feeding programs, and the rest were a mixture of food subsidies, community food kitchens, and other feeding programs. Some 100 million beneficiaries were covered (24% of the total population of the region): 5 million mothers, 24 million infants and pre-school age children, 42 million school age children, and 29 million other beneficiaries. The coverage of the maternal and child health programs far exceeded the estimated number of malnourished children in the studied countries, suggesting that investments in these programs were misdirected and that greater progress could be achieved with the same level of resources.

Breastfeeding promotion activities have been and are being implemented in a number of countries with variable coverage, mix of interventions and effectiveness, often by non-governmental organizations without significant government political commitment and support. Sustainability of apparently successful pilot or demonstration projects has often been problematic. Significant efforts have been made in providing in-service training and motivation to health care personnel, in removing some obvious obstacles to breastfeeding in health facilities (more recently through the Baby Friendly Hospital Initiative) and in promoting legislation on the marketing of breastmilk substitutes.

Much less has been done to formulate and implement national policies for promotion, protection and support of breastfeeding, to strengthen pre-service training of professional and other health care personnel, to routinely provide education and counselling to mothers attending health services and post-natal lactation management support services, and to

monitor current legislation. This is to a great extent the result of poor government political commitment and insufficient resources assigned to breastfeeding.

Greater awareness of the magnitude and public health significance of micronutrient deficiencies has been recently generated in the region (Mora & Dary, 1994). Some micronutrient interventions are being implemented in a number of countries, and there is some interest in integrated approaches rather than in isolated single nutrient interventions. Vitamin A supplementation is in place, albeit irregularly, in some countries (Haiti, Guatemala, Bolivia, El Salvador, and Honduras). Iron (and folate) supplementation to pregnant women and young children is contemplated in the technical norms for maternal and child health (MCH) in most countries, although often not implemented. Sugar fortification with vitamin A resumed in Guatemala and Honduras after years of interruption and was initiated in El Salvador. Iron fortification of food staples such as wheat and corn flour is beginning to be considered. Salt iodination is operational in a number of countries, although monitoring systems are often ineffective. Small scale food production and preservation activities (including some home gardening projects) are being implemented mostly by non-governmental organizations (NGOs) in some countries. Nutrition communication and education activities are still weak and not implemented systematically.

International organizations active in nutrition in the region include the Pan American Health Organization/World Health Organization (PAHO/WHO), the United Nations Children's Emergency Fund (UNICEF), the United Nations Food and Agriculture Organization (FAO), USAID, the World Bank, the Interamerican Development Bank, the World Food Program (WFP), and the European Community (EC). A number of NGOs are also involved in nutrition as implementors of either supplementary feeding or community development programs.

Recently, PAHO/WHO formulated a Regional Plan for Control of Vitamin A Deficiency (PAHO, 1992), an Expanded Program for the Control of Iodine Deficiency Disorders (PAHO, 1988) and a Integrated Regional Breastfeeding Action Plan (PAHO, 1994). UNICEF, FAO and the World Bank are giving increasing priority to assistance in nutrition, including prevention and control of micronutrient deficiencies. USAID, UNICEF and the World Bank are currently preparing micronutrient strategies. The World Food Program and the European Community have been providing food aid and other assistance, whereas FAO and PAHO/WHO have been engaged in follow-up to JCN at the regional and national levels.

In contrast with nutrition intervention programs and projects, much less has been done to promote overall and sector-specific nutrition policies. Some international donors (e.g., the World Bank, UNICEF) have been interested in increasing national concern for nutrition and food security, and in promoting the design and implementation of nutrition-related policy reforms, programs and projects, often to compensate for the potentially negative impact of structural adjustment. UNICEF has actively promoted the notion of structural adjustment with a human face to emphasize the need to protect those segments of the population that are most likely to be adversely affected by economic reforms. While UNICEF's advocacy in

nutrition is mostly based on social equity, ethical and human rights concerns, the World Bank has taken the lead in advocating nutrition on the basis of an economic rationale. Both the equity and the economical rationale are compelling enough to support the need for greater priority to direct nutrition action.

The World Bank has been most active in promoting policy reforms, including structural adjustment policies to restore stability and restructure the economy, with specific attention to protecting the most vulnerable groups (Selowsky, 1991). Such policies have included restructuring of the public sector, improvement of tax systems and reallocation of government expenditures and functions to release resources toward targeted social programs for the very poor. Policies are often complemented by specific projects to strengthen the capability of the country's institutions and delivery systems to efficiently use the additional resources released to provide social services to the most vulnerable groups of the population. The Interamerican Development Bank (IDB) is interested in investing in nutrition as part of its strategies for promoting social and economic development.

Data from the USAID Health Projects Data Base show that USAID funding for nutrition in child survival in the LAC region almost doubled from 1989 to 1992 (\$ 6.9 to \$ 12.7 million). Most of the increase is accounted for by breastfeeding promotion (from \$ 0.9 to \$ 2.1 million) and growth monitoring (from \$ 1.6 to \$ 6.6 million); allocations to maternal nutrition have declined from \$ 1.5 to \$ 0.6 million. Besides mission portfolios, USAID also supports nutrition-related activities and projects in the region through centrally or regionally-funded projects such as: Opportunities for Micronutrient Interventions (OMNI), Food Security and Nutrition Monitoring (IMPACT), Expanded Promotion of Breastfeeding (EPB), Lactation Management Training, Women's and Infant's Nutrition (WIN), Food Technology and Enterprise for Development (SUSTAIN), Maternal and Neonatal Health and Nutrition (Mothercare), LAC Health and Nutrition Sustainability (LAC HNS), Technical Assistance in Food Security for Latin America and the Caribbean (LACTECH), and the Multisectoral Food and Nutrition and Food Aid Indefinite Quantity Contracts (IQCs).

IV. NEED FOR MORE EFFECTIVE NUTRITION POLICIES AND PROGRAMS

Progress in reducing malnutrition in LAC countries has been uneven, with impressive gains in some countries, modest improvements in some, and very little progress, if any, in others. It is precisely the latter countries, as well as those where only modest improvement has occurred, that need to learn from the experience of the former.

Although poverty is clearly an important determinant of nutritional status, there is enough evidence that, both at the aggregate and the individual level, increased income is a necessary but not sufficient condition for improved nutrition. Moreover, some nutrition improvement may be possible through specific actions even under unimpressive economic performance. Of course, progress is greater when sustained economic growth proceeds together with greater social equity. At the national level, a significant relationship has been found between

GNP per capita under US \$900 per year and the prevalence of child malnutrition (United Nations, 1992); such relationship, however, is much weaker at higher GNP levels, such as those of most LAC countries². On this basis, some nutrition improvement through increased GNP would still be possible in Bolivia, Guyana, Haiti, Honduras and Nicaragua.

At any rate, significant nutrition improvement at the national level would require both sustained broad-based economic growth and firm government commitment to promoting nutritional well-being through specific social support policies and actions addressed to communities, families and individuals at risk of malnutrition, including health care and nutrition services and interventions (United Nations, 1991). Countries that have reduced malnutrition rates to levels lower than those expected for their income have consistently given greater priority to public expenditures for social support (primary health care, nutrition, education). Experience from those countries indicates that nutritional improvement was the result of a relatively long-range process lasting more than 25 years, with continuity in social policies, investments, and actions (Horwitz, 1987). Sustained political commitment to social equity was essential.

A dual policy approach appears to be the most promising for improved nutrition: (1) fostering consistent economic growth and (2) promoting greater social equity through distributive policies and the establishment of a safety net of social services to protect the most vulnerable, particularly in times of economic hardship (World Bank, 1990). This is particularly true under the conditions of LAC countries currently undergoing structural adjustment economic policies that are likely to hurt the poor in the short run. In the face of poor economic growth and/or relatively low or inefficient social expenditures, further nutrition improvement will not be possible. But sustained economic growth alone would not be enough, at least in the short-term, to secure nutrition improvement beyond certain limits that have already been reached by most LAC countries. The social and economic cost of not acting would be dramatic: no further improvement and even reversal of the nutritional conditions in countries with uneven economic growth, and persistence of the problem in those experiencing growth alone.

The multiple causality of malnutrition would call for a multi-sectoral approach including sectoral policies and interventions in at least health, agriculture and education. However, after the failure of multisectoral nutrition planning as a comprehensive, systematic and cost-effective approach to address malnutrition, to a large extent due to the absence of a suitable institutional base to meet its ambitious organizational requirements, more emphasis is now placed on sectoral policies and actions and on functional intersectoral coordination. This approach is supported by the recent experience of LAC countries that have successfully reduced childhood malnutrition to levels of non public health significance. In these countries, clusters of sectoral activities have been implemented simultaneously, without a comprehensive multisectoral planning approach or integrated planning process, but supported by well-defined and coordinated sectoral policies (Horwitz, 1987; Valiente, et al., 1993).

² In 1992, GNP per capita was under US \$900 in Bolivia, Guyana, Haiti, Honduras and Nicaragua.

National nutrition action plans that are being prepared in follow-up to the International Conference on Nutrition (ICN) are not likely to foster further significant progress in dealing with the problem unless a strong government political commitment--expressed in budgetary allocations--is secured and explicit sectoral policies are formulated and effectively implemented. Further nutritional improvement in LAC countries will require more aggressive and sustained actions (particularly in countries where the problems are more serious and resilient), greater efficiency in public spending, and improved targeting. As their prevalence declines, nutritional deficiencies tend to cluster in specific groups, and additional improvements are more difficult to achieve unless more effective mechanisms and interventions are implemented to reach those who remain at greatest risk. This can only be achieved through appropriately formulated and implemented sectoral nutrition policies and programs in health, agriculture and education.

V. PREREQUISITES FOR EFFECTIVE SECTORAL NUTRITION POLICIES

There are some general development policy prerequisites for effective implementation of sectoral nutrition-oriented policies (see Box 1).

- **Sound economic policies** are the foundation for consistent economic growth which, in turn, is critical for sustained nutrition improvement. Economic growth is necessary to reduce poverty, so establishing sound economic policies for growth is fundamental. However, the particular strategy adopted for achieving economic growth has enormous implications for how the benefits of growth are distributed throughout the economy, and ultimately affect the nutrition, health and welfare of the poor (United Nations, 1991).
- **Broad-based growth (with equity)** should be the pillar of development strategies so that the poor have better income-earning opportunities and access to social services. Macro-economic policies (monetary and fiscal policies, exchange rates, wages, price structures, and trade policies) may adversely affect the poor if, for instance, they are biased against the agricultural sector or create instability in the availability and prices of food commodities. It is therefore critical that economic policies be designed in such a way that ensures the participation of the poor (e.g., labor intensive development) and provides for their protection, particularly if they are likely to be threatened by economic measures in the short-term.

Growth-oriented economic policies should be complemented with specific policies enabling the poor to participate in economic growth by increasing their access to land, infrastructure, credit and public services, with a view to expanding their income-earning opportunities. This may include policies that encourage rural development (e.g., expanded rural infrastructure, increased small farm production and wage labor) and urban employment for

BOX 1
GENERAL DEVELOPMENT POLICIES WITH SIGNIFICANT
IMPLICATIONS FOR NUTRITION

1. **Sound economic policies.** Sustained economic growth is a necessary, but not sufficient, condition for improving the population's nutritional status.
2. **Policies that guarantee broad-based economic growth (with equity).** Policies that enable the poor to participate in economic growth by increasing their access to land, infrastructure, credit and public services.
3. **Strong government political commitment to social development.** This commitment should be reflected in the allocation of a significant proportion of public spending (above 20%) allocated to the establishment of social services safety net (education, health and nutrition, etc.).
4. **Policies that rationalize the allocation and efficiency of social expenditures.** Greater priority should be assigned to the provision of basic social services (primary health care, primary education) and improvement of their efficiency through stronger management and targeting of services to the most poor.
5. **Promote popular participation in political and economic decision-making.** Popular participation through local community organizations is needed in political decision-making and in the design, implementation and evaluation of social programs and services.
6. **Policies aimed at overcoming gender and racial disparities.** Racial and gender discrimination must be eliminated in terms of access to educational opportunities, employment, credit, infrastructure, and social services.
7. **Population policies.** In some countries, explicit policies are essential to improve women's health and reduce reproductive risk, as well as ensure that population growth keeps pace with the availability of resources.
8. **Policies that ensure the design and use of functional information systems.** Timely information is needed to evaluate the implementation of policies and programs, to modify and reorient them, and to monitor trends in social change.
9. **Policies of institutional and human resource development.** Institutional strengthening and human resource training should be directed at improving the efficiency of social sector spending.
10. **Specific policies of consumer food price subsidies.** Policies of non-generalized food price subsidies, targeted at the lowest income groups, can achieve high benefits in relation to their costs.

unskilled workers while enhancing their job skills through investments in health and education. Redistributive policies through progressive taxation and self-targeting (not general) consumer price policies and subsidies are also important. In the 1970s, Colombia was able to improve an initially very unequal distribution of income by progressive taxation, increase in real unskilled wages, and enhanced job skills of unskilled workers through an

aggressive training program (World Bank, 1990); nutrition improvement was also significant (Mora et al., 1992).

■ **Strong government political commitment to social development** is vital for securing the well-being of the people and protecting the country's human capital, with specific emphasis on nutrition improvement, and explicit translation of the political will into national policies assigning high priority and the maximum possible budgetary allocation to the social sector (United Nations, 1994). Significant social progress has been achieved in countries with at least 20% of their gross domestic product allocated to the social sector (education, health and nutrition, housing, social security and labor). In the 1980s, real per capita public social spending on health, education and social security fell in a number of LAC countries, while efforts were made to increase the efficiency and equity of social service provision (Gross, 1990). More recently, a number of LAC countries are giving higher priority to investments in the social sector and have established Social Emergency Funds and programs.

A stronger government commitment is required in LAC countries with less than expected social progress and nutrition improvement to making education, health care, nutrition and other social services accessible to all levels of society. Social policies should have two main objectives: in the long-term, to promote social progress, e.g., increase poor's participation in development and access to social services; and in the short term, to provide a "social safety net" to protect the most disadvantaged segments of the population from the negative impact of economic adjustment measures. Establishing a social support network or "safety net" of social policies (e.g., food price policies) and well-targetted services/transfers (e.g., minimum food rations) to the poor may be needed, particularly to counteract the social cost of growth-oriented economic policies.

■ **Better allocation and greater efficiency of social expenditures** and, in particular, of those devoted to the provision of basic social services (primary health care, nutrition, education, family planning) should be achieved through improved management, building social infrastructure and targeting of social services to the poor (World Bank, 1993a). Social services are an essential part of any long-term strategy for reducing poverty and malnutrition, and improvements in health, education, and nutrition reinforce each other. Even in the face of financial constraints, restructuring of public expenditures to improve allocation (e.g., emphasizing preventive health care, primary education) and efficiency of social investments may make a significant difference. A shift in the allocation of funds from higher-level services to basic health and primary education will serve both efficiency and equity objectives. In many cases, both the absolute amount and the allocation/efficiency of social expenditures need to improve substantially. By and large, quality assurance of social services and user satisfaction are critical areas requiring significant improvement.

■ **Popular participation in political and economic decision-making**, in program design, implementation and evaluation, and in provision of social services must be explicitly promoted, that is, involving people in the solutions rather than treating them as passive recipients of relief services. Community organization for active and informed popular

participation in policy development and implementation, particularly in provision of social services, is essential. Community participation is likely to be facilitated by decentralization of social service systems: communities are better able to identify their needs, local managers have a better information base and are more responsive to the community, and community participation in program design and implementation would increase service utilization and in-kind or in-cash contributions to support them.

- Overall national policies aimed at overcoming gender and racial disparities in access to education, employment and social services should be formulated and made effective. For instance, long-term policies to reduce women's discrimination and to increase women's income, access to credit, social status and participation in the labor market are critical, as are policies encouraging participation of racial minorities (or majorities) in economic and social development. Racial inequalities are still at the root of social disadvantage, poverty, illiteracy, poor health and malnutrition in a number of LAC countries.

- More consistent population policies may need to be implemented for the purpose of increasing child spacing and reducing too early, too late and unwanted pregnancies, diminishing maternal and child risks, and keeping population growth in check with available resources. Population policies and programs may indirectly improve nutrition by diminishing the nutritional risks associated with close birth spacing and maternal nutrition depletion resulting from closely spaced pregnancies, and by reducing family size and needs for food, shelter, clothing, education and health care. Progress in fertility reduction has greatly differed among LAC countries.

- The need for functional information systems to help track the impact of government policies and programs on the poor can never be overemphasized. Such systems should provide a systematic compilation of social and income indicators (including a food and nutrition surveillance system) to measure economic and social progress by socio-economic strata and provide guidance for decision-making. Indicators may include family income distribution; per capita expenditures in health, education and nutrition; producer prices for small farmers; wages of agricultural laborers and urban unskilled workers; cost-of-living indices; coverage of social services; percentage of school-aged children actually attending school; household expenditures (e.g., total and percent food expenditures); and other indicators (e.g., infant/child mortality and nutritional status indicators).

- Institutional and human resource development is an area of social policy deserving special consideration (World Bank, 1993b). Social sector institutions in the LAC region have traditionally been weak in terms of organizational structure, human resources and implementation capabilities. In the face of a trend to reduce government size, institutional development and strengthening and better trained human resources in the social sector are critical aspects of social policy requiring urgent and more sustained attention. Strengthening the capacity of public institutions for improved management of public expenditures and the provision of basic social services in health and nutrition, education and social welfare, is an important prerequisite for effective social policy implementation.

■ Finally, **consumer food price subsidies** may play an important role in nutrition improvement by increasing the resource base of the poor who usually spent a large proportion of their income in food. The abundant literature on food price subsidies, rations and money transfers has been analytically reviewed (Pinstrup-Andersen, 1989; Musgrove, 1991; Alderman, 1992). In general, increased consumption of food by the poor is seen as both politically more acceptable and socially more desirable than direct income transfers. Food subsidies and income transfers are more likely to improve nutrition when they are combined with nutrition education and related health interventions. Since the targeting efficiency and effectiveness of generalized price subsidies appear to be low, there has been a trend toward favoring more focused approaches, such as self-targeting food subsidies, food stamps and direct food distribution, e.g., food-for-work schemes and supplementary feeding through the health and/or educational system. The latter will be discussed as related to sectoral policies in health and education.

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**GUIDELINES FOR SECTORAL FOOD AND NUTRITION POLICIES IN
THE COUNTRIES OF LATIN AMERICA AND THE CARIBBEAN**

FOOD AND NUTRITION POLICIES IN HEALTH

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**José O. Mora, MD
Eduardo Atalah, MD**

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University Research Corporation/International Science & Technology Institute
7200 Wisconsin Avenue, Suite 600
Bethesda, MD 20814*

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I. INTRODUCTION

The purpose of this module is to provide concrete practical guidance to decision-makers in the health sector of the countries of the Latin American and the Caribbean (LAC) region in order to facilitate the formulation and implementation of sound nutrition in health policies. It provides an outline of the basic rationale for food and nutrition policies in the health sector, describes the type of information needed for nutrition in health policy-making, describes policy options and their strengths and weaknesses, and discusses opportunities and recommended approaches for incorporating nutritional objectives into health policies; finally, it suggests strategies to promote intersectoral coordination in their implementation. The module was prepared by Dr. Jose O. Mora, Deputy Director of the USAID-funded Latin America and Caribbean Health and Nutrition Sustainability (LAC HNS) contract, and Dr. Eduardo Atalah, LAC HNS consultant. It was then reviewed by the participants in two subregional workshops on Food and Nutrition Policies and National Action Plans held in San Jose (Costa Rica) and Santa Cruz (Bolivia) in July 1995, attended by senior officials from the Ministries of Health, Agriculture and Education of 20 countries in the region. The present version of this module incorporates the suggestions and recommendations which came out of the two workshops.

The need for specific food and nutrition policies in the health sector is compelling. First, it is only through explicit nutrition in health policies that a coherent set of nutrition interventions can be designed and implemented effectively within the health sector. Second, policy decisions are needed to secure implementation of effective preventive public health and essential health care and nutrition services. Third, not only does the health sector ultimately carry the economic burden resulting from the excess health care costs associated with malnutrition, but it has the moral and equity responsibility to provide basic health and nutrition services to the neediest. Finally, national policy decisions are required to define what needs to be done to improve nutrition through health-related actions, allocate public resources required to do it, and make provisions for implementation through the service delivery infrastructure of public and, eventually, private institutions.

Nutrition in health policies are needed to translate good intentions and political commitments into action, make provisions to meet national goals, identify sectoral responsibilities, define priorities and intervention strategies, allocate health and nutrition expenditures, foster efficiency in implementation, establish targeting mechanisms, and guide the design and implementation of intervention programs and services. Nutrition in health policies should be complemented and coordinated with other sectoral policies, particularly in the agriculture and education sectors; this is more likely to foster general nutritional improvement than single, isolated interventions.

If the health sector in LAC countries is seriously committed to meeting the nutrition goals for the year 2000, greater priority to nutrition in health is required in most countries, in terms of policy decisions, resource allocation and efficiency of primary health care and nutrition services. The rationale for assigning high priority to nutrition in health stems from both the enormous health and economic implications of nutritional deficiencies resulting in excess burden and reduced efficiency of health care expenditures and the growing evidence that

significant nutritional improvement may be obtained through cost-effective and affordable interventions implemented through the health sector.

Some nutrition in health interventions may also serve as incentives to increase demand for and utilization of other primary health care services (immunizations, child growth monitoring, oral rehydration therapy for diarrhea, child spacing and other basic services), thus increasing coverage and efficiency of health care expenditures which, in turns, will improve nutrition. Therefore, nutrition in health actions are likely to meet both nutritional and health objectives.

Estimations of excess health care expenditures resulting from the increased morbidity rates associated with inappropriate breastfeeding practices and malnutrition in LAC countries have yielded impressive figures. The estimated additional costs to the health care system attributed only to the excess morbidity from diarrhea and respiratory infections associated with non-exclusive breastfeeding early in life represent above 10% of total health expenditures and more than one fourth of recurrent health expenditures in Guatemala, Belize, El Salvador and Peru (Mora, 1991; Huffman et al., 1992; Wong et al., 1994; Baiocchi et al., 1994). Vitamin A deficiency in children and iron deficiency anemia in pregnant women are also associated with increased risk of morbidity and mortality. Furthermore, children born with low birth weight as a result of poor maternal nutrition are at higher risk of malnutrition, infection and developmental disabilities; they are likely to remain malnourished well into childhood, and are twice as likely to die from diarrheal and other diseases.

Finally, nutrition in health interventions represent a critical component of a safety net of social services to provide permanent protection to the poor and most vulnerable segments of the population throughout the development process, and/or temporary protection during difficult times, e.g., to ameliorate the short-term negative effects of structural adjustment. Such a safety net is mainly implemented through the health and educational sectors. Nutrition in health policies should provide a framework for the design and implementation of the nutrition component of such a safety net.

II. RELATIONSHIP BETWEEN NUTRITION AND HEALTH POLICIES

There is a clear relationship between health policies and the nutritional status of a population. In particular, the following general health policies affect nutritional status and are fundamental for the successful implementation of nutrition in health policies and interventions:

A. High priority to health promotion and the provision of a package of basic primary health care services

The purpose is to promote self-care as a basic responsibility of the individual and the community and to reduce disease risks through health promotion and disease prevention,

and to treat illnesses and ameliorate the consequences of disease and disability through the delievery of **essential clinical care**.

Important policy issues to be defined are: definition of poverty and identification of the poor, definition of specific content of the PHC package, reallocation of health care expenditures (e.g., greater priority to PHC versus secondary and tertiary care) to ensure adequate PHC financing, and establishment of effective targeting mechanisms. The content of the package is better defined on the basis of **cost-effectiveness** considerations, that is, the net health/nutrition gain per unit of investment. Recently, the concept of **disability-adjusted life years (DALYs)** has been proposed to measure the effects of basic health/nutrition interventions (World Bank, 1994). Despite its limitations (failure to account for income losses because of disease and for non-health benefits of health/nutrition interventions, insufficient cost-effectiveness data available from non-experimental settings, exclusion of non-economic considerations), the concept has generated a great deal of interest in the LAC region.

B. Emphasis on disease prevention through health promotion and public health interventions, as opposed to curative care

This is, to a large extent, linked to the priority accorded to PHC. This is a difficult policy decision in the face of severely limited resources, large burden of disease and high demand for curative health care for the poor, as well as political pressure for increased expenditures on hospitals, which are often in desperate need of resources.

On the positive side, significant progress has been made in the prevention of infectious diseases through expanded programs of immunization (EPI) and in the availability and use of oral rehydration therapy (ORT) for diarrheal dehydration. However, at least part of the progress has been the result of substantial input from international donors, and there is an urgent need for the countries themselves to secure the long-term sustainability of EPI, ORT and other public health interventions. Much needs to be done also in development and implementation of effective **health and nutrition education and communication**, an area requiring substantially greater efforts and innovation (ineffective educational methodologies are still widely used).

C. Targeting of health and nutrition activities

Targeting is a rational means of effectively using limited resources, by concentrating investments in health and nutrition on the population at greatest risk and therefore with greatest potential for impact; it optimizes the use of resources and increases the impact of interventions.

D. Policies that address regional, racial, urban/rural inequities in the delivery of health care

Greater equity in assigning national resources is badly needed in most LAC countries, particularly in those with large indigenous populations (Guatemala, Peru, Ecuador, Bolivia) that tend to cluster themselves in less accessible rural areas. Further improvement in the nutritional conditions of these countries is not likely unless priority attention is given to securing participation of indigenous populations in development and providing them with culturally and geographically accessible basic social services (health, nutrition, education).

E. Decentralization of health care

Decentralization strengthens local management capacity to deliver basic health care services and facilitates resource mobilization and intersectoral coordination for health and nutrition interventions. Several countries have formulated decentralization policies and made some progress in their implementation, despite significant constraints. Community participation in local program design, implementation and evaluation is more easily achieved in a decentralized health system. Within the context of health promotion, decentralization implies the transfer of decision-making authority to the local level, the reorganization of the health system, and the priority development of local health systems. Against this background, several countries have begun "health cities" initiatives. In the specific case of food security strategies and actions, an intersectoral approach within the process of decentralization underscores the need to "think globally but act locally."

F. Expansion of the capacity of the private sector (both commercial and NGOs) to deliver effective, low-cost, quality health services

Services can be designed for those who are willing and able to pay for the purpose of reducing the demand for public services so that scarce public funds can be reoriented toward increased coverage of preventive services and curative care for those unable to pay for private services. To meet equity objectives, a key policy option is to encourage the private sector, NGOs, municipal governments and community organizations to provide low-cost primary health care services, given that government health services in a number of LAC countries do not have the capacity to achieve significant population coverage and/or to reach those at greatest risk of disease and malnutrition.

III. BASIC INFORMATION FOR THE DEVELOPMENT AND MONITORING OF NUTRITION POLICIES IN HEALTH

Information is a fundamental tool for measuring the magnitude of nutritional problems, generating political commitment, designing the most appropriate type of intervention and evaluating program effectiveness. To meet these objectives, the information used must be valid and representative and presented in a clear and simple format.

Most countries invest great effort and resources in nutrition programs, but show much less concern with obtaining the necessary information to optimally use the resources invested. Frequently, much more information is generated than is needed, with excess costs of data collection, processing and analysis. Often information is obtained only after long delays and is not well utilized because of its poor quality, complexity or the limited analytical capacity of decision-makers. Most countries use too many forms to generate nutritional information in the health sector (more than 15 forms in some cases), a situation which often makes it difficult to answer even basic questions. A limited number of indicators should be defined which are sensitive, easy to collect and interpret, and that are truly useful for the development and monitoring of food and nutrition policies.

The following criteria should be considered in selecting **basic indicators** for the formulation, monitoring and evaluation of food and nutrition policies:

- **Sensitivity.** Indicators should respond early to changes in the level of wellbeing of different population groups (urban/rural, socio-economic level).
- **Specificity.** A change in the indicator should occur with a change in the level of well-being of the population.
- **Measurable at the individual or family level.** Aggregate indicators (e.g., gross national product, unemployment rate, mortality rate) do not adequately reflect changes among the most vulnerable families.
- **Consistency with a defined conceptual framework.** The conceptual framework should relate economic growth and social development with the level of household well-being. It is suggested that economic, food and nutrition indicators be included.
- **Ease of interpretation.** Indicators should be easy for professionals of various disciplines and decision-makers to understand.
- **Reasonable cost.** The costs of data collection, processing and analysis must not be too high.

As a first step, priority problems and the groups most affected by them should be identified. The analysis should basically focus on nutritional deficiencies (protein-energy malnutrition, anemia and iron deficiency, endemic goiter and iodine deficiency, and vitamin A deficiency) most common in low-income countries. In countries undergoing the epidemiologic transition, non-infectious chronic diseases related to diet (obesity, atherosclerosis, hypertension, osteoporosis) should also be considered, since they are growing in prevalence in such countries. Generally, available data are adequate for a first impression, although they may be biased by non-representative samples.

In designing an information system, two main principles should be taken into account: (1) information is only valuable if it is used effectively; and (2) a balance should be struck between the resources used to obtain, process and analyze the data and the resources needed to intervene on the problem. In principle, the use of a certain amount of resources to obtain information is justified; however, even if the cost is relatively low, there is no reason to generate information if it does not lead to action. It should also be kept in mind that some interventions that could have a positive impact on a problem may be very expensive; it is prudent, in such cases, to invest more resources in obtaining information for monitoring and evaluation purposes than will enable public funds to be used more efficiently and to measure progress in achieving goals.

The following basic indicators are proposed (see Box 1):

A. Socio-economic indicators

- total household expenditures
- household food expenditures
- proportion (%) of household expenditures for food

The strong association between expenditures and the level of household well-being makes these indicators highly sensitive and specific. They should be calculated in relation to the number of persons in the household. Some authors use the concept of "adult equivalent" to adjust per capita expenditures to the age of the different family members; it is difficult, however, to define a weighting factor for children of different ages, and the age adjustment does not significantly affect per capita expenditure figures. It is important that economic indicators be adequately adjusted for inflation to signal price fluctuations over time. These indicators are especially useful in urban areas, where different segments of the population can be analyzed (in expenditure deciles or quintiles). There are serious methodological constraints on obtaining such information in rural areas or subsistence economies, although the market value of crops produced can be estimated.

There are other socio-economic indicators which have more limitations. Consensus exists among economists as to the difficulty of accurately measuring income. The measurement of durable goods and property (access to arable land, ownership of cattle, household furnishings, etc.) is also problematic since these also tend to be acquired differently by different social groups. Data on salary levels and type of employment tend to be highly aggregated and available only for the formal sector.

An indicator that is relatively easy to obtain is the proportion of school-age children who attend school. This is an indirect measure of socio-economic level and is, as has been demonstrated in studies on the impact of economic adjustment, very sensitive to changes in household well-being. Other educational indicators, such as the percentage of the population that is literate or the proportion of the population that has completed a certain number of years of schooling, are less sensitive to short-term changes.

BOX 1

BASIC NUTRITION INDICATORS IN HEALTH

A. SOCIO-ECONOMIC INDICATORS

- total household expenditures
- household food expenditures
- proportion (%) of household expenditures for food

B. HEALTH AND NUTRITION INDICATORS

- weight for age in children (under 3 or 5 years)
- height for age in children (under 3 or 5 years)
- height for age in children entering the school system
- newborns with birthweight less than 2,500 grams
- infant mortality rate
- preschool mortality rate

C. COMPLEMENTARY INDICATORS

- prevalence of anemia in pregnant women and children under 5 years
- prevalence of serum retinol levels of less than 20 micrograms/dl in children 1 to 5 years old
- prevalence of goiter in school-age children
- exclusive breastfeeding at 4 to 6 months of age
- individual and household food consumption
- prevalence of obesity in adults or children

Food and nutrient consumption is not recommended as a first-choice indicator, even though it is the most direct measure of household food security. The precise measurement of food consumption is laborious, complicated, relatively expensive and has a higher margin of error than does measurement of expenditures. Furthermore, there is abundant evidence that nutrient consumption responds slowly to changes in income.

B. Health and nutrition indicators

- weight for age in children (under 3 or 5 years)
- height for age in children (under 3 or 5 years)
- height for age in children entering the school system

- newborns with birthweight less than 2,500 grams
- infant mortality rate
- preschool mortality rate

The first three indicators should express prevalence in relation to conventional cut-off points (< 2 Standard Deviations [S.D.] from the NCHS/WHO reference curves). The prevalence of global malnutrition (low weight for age) and chronic malnutrition (low height for age) are direct indicators of well-being and represent one of the best indicators of whether basic needs are being met. Data should be disaggregated by age so that groups of highest risk may be identified and assigned priority for action. Given that most nutritional damage occurs in the first two or three years of life and that there is a need for better coverage of that age group by health programs, information should focus on children under 24 or 36 months. As the nutritional situation of the country improves, it is important to examine the prevalence of low weight for age between 1 and 2 S.D. below the reference (i.e., those at nutritional risk) so that this group may be identified and incorporated into preventive programs.

Height at school entry reflects that cumulative effects of environment and access to health and nutrition services since the prenatal period. **School height censuses** represent a low-cost method for obtaining nutritional information which is representative at the national, regional and even lower administrative levels. Censuses are especially useful when nutritional data are not available on pre-school age children, and they have been used to construct poverty or "social vulnerability" maps (Panama, Venezuela, Chile and El Salvador). One of their limitations is the relatively long period between changes in the level of household well-being and the appearance of height deficits in school children. Recently there has been much debate about the validity of school censuses due to problems with data quality (lack of standardization and calibration), representativity (especially when the level of school enrollment is low), and because with a well-designed sample, better quality data can be obtained at lower cost. When the objective is simply to obtain overall nutritional information, a census is not justified; height can be studied effectively through a representative sample. However, if the objective is to construct a map of social vulnerability that serves to plan actions at the local level, then a height census can be very useful.

When weight and height information are available, the indicator weight for height can be estimated. This indicator, which has been used frequently in Latin America, reflects the recent nutritional situation (wasting or acute malnutrition) and complements information from other indicators (weight for age and height for age). However, chronic undernutrition often simultaneously compromises both weight and height without producing a weight-for-height deficit, suggesting that the value of this indicator is limited. Weight for height is less important in the region as a single indicator of the nutritional situation given the low prevalence of low values for this indicator and the high proportion of false negatives (chronically undernourished children with normal weight for height), factors which lead to an underestimation of the real magnitude of the nutritional problem.

The distribution of **birth weight** is an indirect indicator of the nutritional status of the mother and the level of well-being of the population. Even though numerous factors affect birth weight, a high prevalence of low birth weight is an indicator of maternal malnutrition. Birth weight is relatively easy to obtain at low cost, sensitive and specific to changes in maternal well-being, and is especially useful when information on maternal nutritional status is not available. The proportion of newborns with birth weight of less than 2,500 grams (low birth weight) should not be above 4% or 5% in well nourished populations; in most countries of the region, the rate is two or three times greater. As the proportion of low birth weight infants drops below 10%, it is important to also be concerned with newborns with insufficient weight (2,500 to 3,000 grams) who are also at higher risk of illness and death. The proportion of newborns with insufficient weight is from 15% to 20% in well nourished mothers and two to three times that in undernourished mothers.

Infant and preschool (1 to 4 years) mortality rates are also sensitive to changes in well-being, available in most countries, widely accepted, and facilitate international comparisons. Their usefulness is limited by the fact that they are highly aggregated, which makes it difficult to discern differences by geographic area or by socio-economic group. There is also an underreporting bias in less developed countries with incomplete vital statistics. An infant mortality rate above 50 to 60 per 1000 live births is an indirect reflection of a high rate of malnutrition. The same occurs with preschool mortality, which is less than one per 1000 in well nourished populations and five or more times larger in groups with a high prevalence of malnutrition. In addition to the mortality indicators, some morbidity indicators, especially those related to food-borne diseases (acute diarrhea, food poisoning), merit consideration.

C. Complementary indicators

Depending on the availability of resources and the type of nutritional problems experienced, some other complementary indicators may be considered to help better define the problem and the type of intervention required, especially related to specific deficiencies.

- prevalence of anemia in pregnant women and children under 5 years
- prevalence of serum retinol levels of less than 20 micrograms/dl in children 1 to 5 years old
- prevalence of goiter in school-age children
- exclusive breastfeeding at 4 to 6 months of age
- individual and household food consumption
- prevalence of obesity in adults or children

Data on anemia requires measurement of serum hemoglobin in order to quantify the magnitude of the problem and the expected impact of measures to combat it. The use of portable hemoglobinometers with immediate digital read-out (from a drop of blood) facilitates hemoglobin measurement in population studies. Vitamin A deficiency may be suspected when characteristic ocular symptoms (xerophthalmia) or night blindness are present, since these are very uncommon in LAC; nevertheless, marginal or subclinical deficiency, which is

highly prevalent in the region, can only be detected in population groups through measurement of serum retinol, although it may be suspected when there is low consumption of vitamin A-rich foods.¹ In the few countries or regions where iodine deficiency and endemic goiter constitute public health problems, their geographic distribution must be identified. Surveys of iodine levels and goiter in school children yield good information on the magnitude of the problem in the general population.

It is also important to determine the breastfeeding status of the most vulnerable groups in order to develop appropriate promotion strategies. Various indicators have been proposed, but probably the most useful is the proportion of infants 4 to 6 months of age who are being exclusively breastfed and the proportion of infants 6 to 8 months of age who are being breastfed and given solid foods. Despite the limitations and the costs of dietary surveys, they are an important instrument for defining the quality of the diet and the risk of energy and specific nutrient deficits (iron, protein, vitamin A). Such surveys provide the information needed to design more effective educational strategies and interventions to improve dietary practices.

In developing countries, nutritional deficiencies far outweigh the prevalence of obesity and other illnesses associated with overnutrition. Nevertheless, a growing problem of overweight and obesity has been observed in some countries, especially among the adult population. In middle-income countries, overweight has been associated with poverty and chronic undernutrition. It has been found that individuals with low height and/or low income have a significantly higher risk of obesity than the general population. Obesity is an important risk factor for many chronic illnesses, which account for 45% of all deaths in some countries of the region. This suggests the need for a better understanding of the magnitude of the problem and the initiation of measures to prevent and control overnutrition.

D. Sources of information

The following considerations may help to assess the usefulness of existing information sources:

■ **Data representativity.** Censuses and systematic random sample surveys (e.g., Demographic and Health Surveys, living standards surveys, height censuses) are the most representative sources of information. In only a few countries do routine records of the health sector present the necessary representativity, as in cases where coverage of the health system is high (e.g., Chile, Costa Rica). When coverage is low, the representativity of health services data is doubtful. In recent years, some countries have implemented epidemiologic surveillance systems using "sentinel sites"; in such cases, the representativity of the data depends on the selection criteria for the sentinel sites. The population group of

¹ IVACG has proposed a methodology for a simplified dietary survey to identify families or groups at risk of vitamin A deficiency.

interest must be well defined before determining which information source is the most appropriate.

- **Accuracy.** The low quality of information in routine management systems is a well known problem. Routine assessments of nutritional status that are performed in health facilities typically suffer from measurement errors, lack of calibration of equipment, and lack of standardization in measurement, age calculation, nutritional classification, record-keeping and interpretation. All of these factors can produce significant error in the estimation of the prevalence of malnutrition. If the objective is to have an estimate of the magnitude of the problem among users of health services, then health facility records are probably sufficient. If, however, the objective is to measure the effects of an intervention or nutritional tendencies, then such records are not adequate. More precise and standardized data can be obtained through special surveys.

- **Frequency of the information.** Routine data are usually generated monthly, while surveys and censuses are carried out every several years. The appropriate frequency of nutritional status data will depend on the magnitude of the expected changes, the data analysis capability, and how the information will be used in the decision-making process. Generally, it is not necessary to rely on routine data on a monthly basis, since changes in nutritional trends or seasonal variations can be detected with data collected every 3 or 6 months.

- **Timeliness of the information.** Traditionally, survey data have taken more time to process and analyze than routine information. However, computers have practically eliminated this difference, and what is more, there are typically delays of a year or more in processing routine service data. The latter do not necessarily yield more timely information.

- **Ability to disaggregate data.** Censuses and routine data may be disaggregated in very small geographic units, which facilitates the identification of high risk groups and permits the design of more focused interventions. Surveys, on the other hand, require large sample sizes in order to maintain representativeness in smaller territorial units. A Demographic and Health Survey with a sample of 5000 households is typically statistically representative only at the region or province level, which is adequate for the design of an intervention but not for constructing a nutritional or social vulnerability map.

Recently, Freire and colleagues developed a methodology for developing more disaggregated estimates from a national survey (Freire, et al., 1986). Using multivariate analysis (logistical regression), the authors identified socio-economic indicators that best predicted nutritional status in Ecuador. The equations were then applied to socio-economic data from the Population Census and yielded a high level of agreement between the projected prevalence of malnutrition and that obtained in the national height census. In other words, the method successfully predicted the prevalence of malnutrition in small geographical units (municipalities and districts) based on the socio-economic data from the national census and the regression equations obtained from the national health and nutrition survey.

E. Food and nutrition surveillance systems

In the last 20 years, numerous international cooperation agencies have promoted the creation of food and nutrition surveillance systems at the country level. Due to the multi-causality of nutritional problems, these systems have been conceptualized as having multisectoral information, encompassing variables from the entire food process: availability, consumption and biological utilization (agricultural, economic, educational, employment, environmental sanitation, health and nutrition indicators). Experiences in this direction have not been very positive due to the difficulties inherent in implementing such a complex system, limited capability for data analysis and utilization of the information, and because often such systems become ends in themselves instead of instruments for decision-making. More than a single multisectoral system, what is important is that information be made available in the respective sectors, with emphasis on the indicators described above, and that it be effectively used in decision-making and policy development. Food and nutrition surveillance systems should include indicators that permit monitoring of the implementation and impact of national food and nutrition plans as well as the policies and processes of structural adjustment.

F. Data collection, organization and presentation

Several alternative information sources should be considered. As a first step, routinely available information should be examined; such information often includes such indicators as food prices, industrial output, the level of employment, and mortality rates, among others. Anthropometric data from the health services and schools can give a rough idea of trends in those indicators. In some cases, short-term technical assistance and modest investments in computer software can help make available data more accessible on a timely basis.

In some Latin American countries, household surveys with national samples have been carried out with support from the World Bank; these surveys have included a series of indicators of household well-being and in some cases, anthropometric measurements. The Demographic and Health Surveys supported by USAID also include many of the above-recommended indicators and also offer the possibility of including additional modules at a marginal cost. Most of the recent Demographic and Health Surveys have included anthropometric measurements of children under 36 months, providing an excellent source of information on nutritional status. If such household surveys or other appropriate information sources are not available, the implementation of a nutritional survey should be considered. The estimated cost of a nutritional survey is on the order of US\$100,000 to \$200,000 for a sample of 5,000 households, including survey design, data collection and processing, analysis and dissemination of results. Such surveys should be carried out every two or three years.

Timely and appropriate information is essential for effective decision-making about policies and programs to improve the population's nutritional status. For such information to be useful, it should be disseminated among decision-makers at different levels of the system, on a timely basis and in a form that is readily interpretable. To this effect, efforts should be

made to adapt information to the needs of decision-makers. Various strategies can facilitate the use of available information to incorporate nutritional objectives in health policies. Information must be representative, reliable, and timely, and it must be presented in a simple format that is easily understood by professionals of diverse backgrounds.

As a first step, it is essential to sensitize public opinion and decision-makers to the importance of nutritional problems. This involves not only measuring the prevalence of specific maladies in a specific period, but also demonstrating their economic repercussions and the changes or trends over time which policies and programs produce. It may be useful to compare the rate of change over different periods and projections in order to estimate the time needed to attain an acceptable level of those indicators which are targeted for change. USAID has developed a computer program (called PROFILES) which uses actual data from a particular country to estimate the economic and other effects of nutritional problems as well as the expected cost and impact of interventions. Such software affords a valuable tool for policy advocacy for generating or increasing political commitment to addressing nutritional problems.

Comparisons of national data with indicators from other countries at similar levels of development but with better levels of health and nutrition can help to raise consciousness about the need for strengthening policies and investments in nutrition. At the same time, it is useful to compare indicators for different areas within a country in order to show existing inequalities and to guide the setting of goals and priorities for intervention. Academic groups and scientific societies can play a key role in providing independent assessments of inequities in health and nutrition and the need for strengthening interventions.

The mobilization of social organizations is another strategy to sensitize public opinion and decision-makers. With support from UNICEF, a "Baby Friendly Cities" movement was recently begun in Chile (emulating the "Baby Friendly Hospitals") to institute a series of initiatives with the goal of reducing disparities in the quality of life of children. Similar efforts, such as "healthy cities," "healthy schools," and "maternal and child friendly institutions" are underway in some countries. Finally, it is important also to strengthen those institutions which are responsible for addressing nutritional problems, enhance the technical capabilities of research and associated academic groups, and improve the management capability of public sector service delivery institutions; this will also contribute to better utilization of data for policy development.

IV. INCORPORATION OF NUTRITIONAL OBJECTIVES IN HEALTH POLICIES

Although most of the countries implicitly recognize the seriousness and implications of nutritional problems, this does not always translate into an active position aimed at preventing and treating them. In some countries, health specialists have a "fatalistic" attitude because of their conviction that there is no "solution" to the nutritional problem. This disenchantment is heightened by the small impact of dietary interventions, the "response" to

the problem that has most often been proposed. This attitude will certainly change if the positive experiences of several of the region's countries (Chile, Costa Rica, Jamaica, Colombia, and Brazil) in reducing childhood malnutrition are disseminated.

It is essential that health specialists make greater efforts to include more explicit nutritional objectives in health policies, which should not only focus on recovery from malnutrition but also deal with the various factors underlying nutritional status in order to prevent malnutrition. This should lead to better allocation of human and financial resources to intervention programs, without which policies will be ineffective. Various conditions have now created a more favorable environment and better opportunities for formulating and establishing nutrition policies in the health sector. The following can be noted among them:

- (a) The commitments made by the region's governments to children and nutrition at several international meetings: the World Children's Summit (1990), the Innocenti Declaration on Promoting, Protecting, and Supporting Breastfeeding (1990), and the International Nutrition Conference (1992). There is also a commitment to draw up specific plans of action to fulfill the goals proposed.
- (b) Lessons learned in recent decades about the kinds of interventions that have a greater probability of having impact, and recognition that emphasis should be placed more on sectoral interventions than on ambitious intersectoral programs.
- (c) The active support of bilateral and multinational cooperation agencies in effectively advancing the prevention and control of nutritional problems.

Health policies and the programs and interventions stemming from them have a variety of nutritional effects on the most vulnerable population. It has been demonstrated that a decisive factor leading to malnutrition is the inadequate access of the population at risk to preventive and curative health services. Thus, improving the coverage of primary care services, especially in lower-income groups and rural communities, should be a primary concern in health and nutrition policies. Policies that focus social expenditures especially on primary care and nutrition have shown themselves to be more cost-effective than other interventions and to contribute more effectively to improving nutritional status, while greater equity in income distribution is achieved.

Mistakenly and very narrowly, nutritional programs have almost become synonymous with food aid. In many of the region's countries, the Department of Nutrition in the Ministry of Health devotes a large part of its time to food assistance programs while neglecting other essential functions. It is especially worrisome that most of nutritionists' time is often devoted to administrative activities related to food distribution which could be performed more efficiently by a specialized administrative unit. This means that food distribution is conducted inadequately and, moreover, that other technical duties of greater importance are not carried out. Food distribution is neither the only nor the most important intervention to change nutritional status. There are many other opportunities for influencing nutrition

through interventions that change some of the determining factors, as described above. Specialists in each discipline and high-level Ministry officials often do not recognize this fact.

Nutrition Departments are responsible for promoting the inclusion of nutritional objectives in different maternal and child, adult, and senior-citizen health, environmental sanitation, health education, and other programs. This is not done in practice for lack of coordination between the technical departments of General Directorates of Health and because of the low profile that Nutrition Departments often have. Chile's experience shows that significant progress can be achieved in nutritional status by including nutritional objectives in each of the specific health programs. The maternal and child health program, which is directly responsible for most activities to prevent and treat nutritional problems, is particularly important.

Different nutrition-in-health policies, and combinations of them, have been proposed, formulated and implemented with varying degrees of success. Traditionally, the following specific policy and program interventions have been considered, one or more of which have been included within national nutrition plans in the LAC region: (1) supplementary feeding, (2) nutrition education, (3) food fortification, (4) formulated foods, and (5) consumer price subsidies. In some cases, integrated nutrition programs have been implemented within the primary health care system, often in the form of small-scale demonstration projects that have eventually been scaled up to the district level. The 1993 World Development Report (World Bank, 1993) suggests a set of six nutrition interventions in public health: (1) nutrition education, (2) control of intestinal parasites, (3) micronutrient fortification of food, (4) micronutrient supplementation, (5) food supplements, and (6) food price subsidies.

Data on the costs and effectiveness of individual policies and interventions are far from complete. In general, there is more information on cost-effectiveness of breastfeeding promotion, micronutrient fortification or supplementation, and supplementary feeding than of nutrition education, control of intestinal parasites, food price subsidies and integrated programs. The information available allows consideration of a number of different promising options. Recently collected cost-effectiveness data are available from LAC HNS on breastfeeding promotion through hospitals, on vitamin A and iron interventions, and on MCH supplementary feeding, school feeding and cash transfer programs.

In general, the following options for including nutritional objectives in health policies should be considered (see Box 2):

A. Health promotion

Health promotion is a policy and a strategy for improving life expectancy and quality of life at the same time as reducing the need for clinical services. The ultimate objective of health promotion is to strengthen the capability of the individual and of the community for self-care and disease prevention through the adoption of healthy behaviors, lifestyles and environments and seeking appropriate care for illnesses. Health promotion involves the dissemination of

BOX 2

INCLUSION OF NUTRITIONAL OBJECTIVES IN HEALTH POLICIES

- A. HEALTH PROMOTION
- B. PRIMARY HEALTH CARE
 1. Breastfeeding and Infant Nutrition
 2. Growth Monitoring and Promotion
 3. Prenatal Care and Maternal Nutrition
 4. Prevention and Control of Infectious Diseases
 5. Dietary Management of Infectious Diseases in Children
 6. Prevention and Treatment of Intestinal Parasites
 7. Treatment of Malnutrition
 8. Promotion of Family Food Production, Preservation and Consumption
- C. SUPPLEMENTARY FEEDING
- D. PREVENTION AND CONTROL OF MICRONUTRIENT DEFICIENCIES
- E. INFORMATION, EDUCATION AND COMMUNICATION (IEC) IN NUTRITION AND HEALTH
- F. POPULATION POLICIES IN HEALTH
- G. DEVELOPMENT OF HUMAN RESOURCES

information to all members of society on the importance and most effective methods for protecting health and on the causes and most effective methods for preventing illness. It requires raising consciousness about individual and collective responsibility for health through the adoption of healthy dietary and nutritional practices. To this end, **educational communication** through all available media should be used to induce positive changes in dietary, nutritional and health behaviors.

Health promotion implies the creation of a "**health culture**," which may be defined as a new individual and collective consciousness about responsibility for self-care, aimed at promoting and protecting health and preventing illness, especially related to diet and nutrition. The objective is to prevent nutritional illnesses, both those associated with deficiencies and those associated with excess consumption, the latter of which are growing in importance in many countries of the region. The active and democratic participation of the population in

identifying and resolving their own problems is imperative, using conceptual, attitudinal and behavioral instruments to improve the quality of life through health protection and disease prevention. This involves the creation of healthy lifestyles and environments and the prevention of nutritional deficiencies and chronic diseases which result from an excessive or unbalanced diet. Health promotion acknowledges the fundamental role that education plays as an instrument of sustainable, positive social change within a context of respect for human dignity.

B. Primary health care

Of all the policy options in the health sector, inclusion of nutrition objectives and services in primary health care (PHC) has the greatest potential for improving nutritional status. Primary health care is the universally accepted strategy for achieving health for all, and to a greater or lesser extent is being pursued in all of the region's countries. The strategy rests on reorienting the health system and redistributing resources so that individuals and communities themselves become responsible for caring for their own health. It also involves improving the efficiency of services by providing greater coverage in communities themselves through **local health systems** emphasizing preventive activities and health promotion with effective technologies. Despite efforts to improve primary care coverage, it continues to be lower than 50% in several countries in the region, which in part reflects the lack of political will to reduce inequalities in access to health care. Extending the coverage of primary health care is critical to improving nutritional status. The dilemma is how to increase primary care coverage with reduced budgets and in an environment of fiscal discipline.

The importance of a strong primary health care system with broad coverage and great efficiency in providing basic services to the poor as a prerequisite for effective nutrition interventions in health care can never be emphasized enough. The primary care strategy is the most appropriate vehicle for establishing basic health and nutrition interventions focusing on mothers and children. Nevertheless, the apparent support of that strategy by governments and Health Ministries does not always result in explicit policies and adequate allocation of resources; for this reason, the potential of PHC to increase coverage and efficiency in delivering basic health services has not been sufficiently exploited. It is necessary to explore various alternatives which, synergistically, can help improve PHC coverage and effectiveness:

- **Gradually restoring the historical budgets of Health Ministries as a percentage of Gross Domestic Product (GDP) or fiscal expenditures.** Public expenditures on health vary in the region's various countries from 1.2% to 6.7% of GDP and from 3% to 32% of central government expenditures. About 3% or 4% of GDP, depending on the complexity and efficiency of a system and historical trends, would be an acceptable minimum. It is important to include this idea in every new government program to bring about gradual and sustained increases in health sector resources.

■ **Reallocate budgets within the sector.** In most of the countries, more than 90% of the health budget goes to hospital care which, despite the size of the proportion, often has serious deficiencies. Reassignment of resources from hospital to primary care will have to counter opposition from the clinical sector, which often has greater power and control over decision-making. Nevertheless, it should be argued that while there are not satisfactory disease prevention and control programs at the primary level, pressure will continue at the hospital level to treat pathologies which often represent a failure at the primary care level. In Chile, the pediatric bed occupancy index fell by 50% when child malnutrition and the incidence of diarrheas were reduced, though almost the same number of beds were kept in operation in the last 30 years.

■ **Reassign human resources.** In all of the region's countries there is a concentration of human resources in urban centers and in hospitals, to the detriment of the rural sector and primary care. Panama, for example, has an adequate number of physicians per thousand population nationally, but a concentration seven times greater in the capital than in the least developed provinces; the same trend occurs for nurses and nurse auxiliaries. The few professional nutritionists working for Health Ministries are often concentrated in hospitals or at the central or regional levels and devote only a small part of their time to the technical aspects of nutritional interventions. Resource mobilization should overcome the resistance of personnel, but inducements must be created which will facilitate such reassignment.

■ **Demedicalize primary care.** In some countries, health care seems to be synonymous with medical care. A very restricted view holds that all health care activities should be performed by physicians. Although there are nurses and nurse auxiliaries in outpatient health services, they frequently act as physicians' assistants or secretaries instead of performing activities independently. This has two major consequences: (1) disease prevention and health promotion are generally carried out inadequately because of the scant importance physicians attach to such activities; and (2) it significantly increases the cost of primary care.

There are many successful experiences in increasing coverage using adequately trained and supervised non-professional staff (nurse auxiliaries, health promoters, health assistants), especially in non-governmental organizations (NGOs). Even unpaid mothers in a community can perform health promotion and protection activities and have an impact on preventing and treating child malnutrition. In Chile, more than 95% of health check-ups are performed by nurses and nurse auxiliaries. Physicians routinely perform initial check-ups only on newborns and, occasionally, examinations on referral from another member of the health team. Something similar happens with prenatal check-ups for pregnant mothers, who are chiefly cared for by midwives (whose training is equivalent to that of nurses) and not by physicians.

A satisfactory coverage extension strategy should include increased participation by nurses, auxiliaries, and health promoters in health care, together with the inclusion of nutrition

activities in primary health care and child survival strategies. Some small-scale experiments, as well as efforts at greater coverage, demonstrate that such integration is effective in improving child nutrition within a reasonable time at relatively low annual cost (US\$10 to \$30 per beneficiary). In contrast, food supplementation programs not included in primary health care activities have been relatively ineffective in improving nutrition, though their cost is significantly greater (US\$30 to \$60 per capita per year).

The number of malnutrition cases in a community depends both on the number of new cases (incidence) and the course of existing ones. The greatest intervention effort is often aimed at nutritional recovery; nevertheless, it is impossible to lessen the prevalence of malnutrition without reducing the number of new cases through primary prevention measures. An adequate malnutrition control program should therefore include a combination of both types of intervention. Some interventions serve both purposes simultaneously: iron supplementation for pregnant women, for example, can prevent as well as treat iron-deficiency anemias.

The nutrition policies in primary health care that in the short term have shown a large positive impact on nutritional status when implemented systematically in high-risk groups are described below.

1. Breastfeeding and infant nutrition

Health policies aimed at improving infant feeding practices, including breastfeeding protection, promotion and support, constitute one of the most promising approaches to improve infant and child nutrition in LAC countries. They should be given high priority in nutrition policies. Breastfeeding provides total food security for infants up to six months of age and partially well beyond that age. Breast milk is the most important source of available food for infants in LAC countries, both in quantity and quality, providing adequate amounts of essential macro and micronutrients for at least the first six months of life. Besides its key nutritional, anti-infective and psychosocial stimulation advantages, breastfeeding reduces infant exposure to infection in contaminated environments, and lactational amenorrhea reduces fertility, thus increasing birth spacing. Effective breastfeeding policies and interventions not only yield important savings in perinatal care (expensive incubators, glucose, uterine-contracting drugs, infant formula, rooming space) but, to an even larger extent, generate savings in health care costs resulting from reduction of excess morbidity and mortality associated with inadequate infant feeding practices.

The health, nutrition and other advantages of breastfeeding can only be fully realized when breast milk alone is provided **exclusive** of other foods (even water or other liquids) up to about 6 months of age and then gradually supplemented with frequent feeds of calorie- and nutrient-dense foods. The common practice of early introduction of foods other than breast milk carries a substantial additional risk of morbidity. Non-exclusive breastfeeding before six months of age, that is, early introduction of liquids or foods other than breast milk, accounts for most of the excess episodes of diarrheal and other infectious morbidity beyond

those for exclusively breast-fed infants. Therefore, the ultimate goals of breastfeeding and infant feeding policies are to significantly increase the rate (frequency/duration) of exclusive breastfeeding through the first 6 months of life and to institute proper weaning practices (supplemented breastfeeding) from then on.

Currently, most countries implement breastfeeding and infant feeding promotion activities with variable coverage, mix of interventions and effectiveness. Infant feeding counseling and education is expected to be provided together with child's growth monitoring. Formerly narrow-focused breastfeeding promotion programs have begun to expand their scope into infant feeding and weaning practices. However, the major responsibility for breastfeeding promotion is usually in the hands of National Breastfeeding Commissions (sometimes with nominal representation of the Ministry of Health), in collaboration with non-governmental organizations (NGOs). Government political commitment is often weak, with no explicit policies formulated or implemented, and breastfeeding promotion activities are carried out with little, if any, public sector participation and financial support. Hence, program implementation suffers from weak political commitment, relatively low coverage and effectiveness, and poor financial and institutional sustainability.

For a long time, there has been some skepticism as to the feasibility of improving breastfeeding in the face of growing urbanization and increasing women's participation in the labor market. Strong evidence is now being accumulated in the LAC region on the effectiveness of a combination of low-cost interventions to improve the frequency and duration of exclusive breastfeeding (Burkhalter and Marin, 1991; Altobelli et al., 1991; Huffman, 1992; Lutter et al., 1994). LAC HNS cost-effectiveness studies have shown that breastfeeding promotion is one of the most cost-effective health interventions, in terms of cost per both additional day of exclusive breastfeeding (US \$0.10 per day) and Disability-Adjusted Life Years (DALYs) gained (\$0.25 to \$3.75 per DALY). The demonstration that a well-defined health intervention package is highly cost-effective in significantly improving exclusive breastfeeding and in terms of cost per DALY gained, provides a strong case and convincing argument for priority investments in breastfeeding promotion as part of improving overall infant feeding.

The health sector is responsible for formulation and implementation of explicit policies to promote, protect, and support infant feeding and breastfeeding, with the following main objectives:

- **Increase awareness** among health personnel, non-governmental organizations, communities and the general public of the importance of breastfeeding, its superiority to any other infant feeding method, and appropriate weaning practices.
- **Support mothers** in their choice to breastfeed by removing obstacles and preventing interference that they may face in health services before, during and after delivery, in the work-place, or in the community.

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- **Ensure that all health personnel concerned are trained in appropriate infant and young child feeding practices, including the application of the principles laid down in the joint WHO/UNICEF statement on breastfeeding and the role of maternity services.**

- **Foster appropriate weaning and complementary feeding practices from the age of about six months, emphasizing continued breastfeeding, frequent feeding with safe and adequate amounts of calorie- and nutrient-dense local foods, and appropriate dietary management of infectious diseases in children, particularly diarrhea.**

- **Ensure periodic updating and full compliance with national legislation related to infant foods and the International Code of Marketing of Breast Milk Substitutes and that there are no donations of free or subsidized supplies of breast milk substitutes and other products covered by the code in any part of the health care system.**

As with other nutrition in health policies, implementation of national infant feeding/breastfeeding policies requires systematic information to health personnel and assignment of appropriate resources, through budgetary allocations. Implementation costs for breastfeeding promotion are not large and are more than compensated for by the important savings resulting from changing institutional practices. Given common financial constraints, such savings are usually attractive to health administrators. Considerable savings in health care are possible through establishing and/or expanding rooming-in, restricting the use of infant formula to very few instances and rationalizing the use of uterine-contracting drugs in maternity services, as well as from improving weaning and infant feeding practices.

High cost-effectiveness can only be achieved when changing institutional routines in maternity services is complemented with comprehensive support and educational services for mothers, especially in the post-partum period and during weaning. Increases in effectiveness can be expected from greater attention to the quality and coverage of maternal education and support, aimed specifically at building confidence and specific lactation management and infant feeding skills; investing in support during the post-natal period appears to be especially worthwhile. The financial benefits accrued by savings and increased effectiveness are likely to be considerable for hospitals and other health care facilities in reduced costs for maternity care and attention of fewer pediatric infection cases.

Infant feeding/breastfeeding policies should include a combination of policy initiatives related to provision of maternal and child health care services, pre-service and in-service training and education of health professionals, communication and mother's education and counseling on breastfeeding/infant feeding, and monitoring of the marketing of breast milk substitutes.

a. *Institutional policies in maternal and child health care*

To the extent possible, these policies should be targeted at both public and private service facilities and include:

- **Establishing explicit norms and guidelines for health care personnel and institutional practices** so that breastfeeding and proper weaning are systematically promoted, encouraged, facilitated and supported throughout the health system, especially through maternal and child health (MCH) prenatal, perinatal and post-natal services, well-baby clinics and other child care services.

- **Changing routine practices in health facilities** (e.g., maternity wards, ambulatory services) to encourage and facilitate breastfeeding by removing all obstacles to proper initiation and continuation, and to routinely advise mothers on timely supplementation. This is important in LAC countries where an increasing proportion of births occur at health facilities.

Positive practices to be systematically instituted include: breastfeeding motivation and training of pregnant women beginning at their initial contact for prenatal care; routine information to pregnant women about the benefits and management of breastfeeding; hospital norms for rooming-in; immediate initiation of breastfeeding in the delivery room; practical training of mothers on appropriate breastfeeding and weaning techniques, and assistance to initiate and maintain lactation; encouragement of breastfeeding on demand; suppression of glucose water and bottles or pacifiers for newborns; judicious use of infant formula; avoidance of maternal-child separation and minimal use of oxytocin and other medications likely to decrease milk output; and education/counselling on how to maintain lactation, prevent common problems, begin supplementation, determine if breast milk is sufficient, increase milk supply and go for help with breastfeeding after leaving the health facility.

- **Providing active support to the Baby Friendly Hospital Initiative** that encourages the application of the "Ten steps to successful breastfeeding" in public and private hospitals and maternity services, and promote proper weaning practices. Special emphasis should be placed on university (teaching) hospitals.

- **Facilitating outreach of infant feeding/breastfeeding support activities**, e.g., by fostering the establishment of lactation management clinic services and community support groups to which mothers are systematically referred.

b. Promotion and monitoring of appropriate legislation

Appropriate legislation is needed to protect and facilitate breastfeeding in the work-place, as well as ensure enforcement of legislation related to infant foods and health care services. Although promoting, passing and enforcing woman's labor legislation is not a direct function of the health sector, a promotion and monitoring role is well justified, including maternity leaves, nursing breaks and provision of facilities for breastfeeding at the work-place (and in prisons), including nurseries or creches and facilities for expression and storage of breast milk. Most LAC countries have subscribed to the International Code of Marketing of Breast Milk Substitutes and have enacted national legislation to comply with it. While legislation may need to be revised, completed or updated in some countries, the most important need is

for systematic law enforcement and monitoring. Policy provisions need to be made for bringing the code (and national measures developed to give effect to it) to the attention of health workers and for establishing routine monitoring through existing national health, regulatory, commercial and other administrative structures.

2. Growth monitoring and promotion

Although it is not an intervention in and itself, monitoring of child growth as an educational tool and for the purpose of taking appropriate actions to improving development is another very useful tool in preventing and controlling nutritional problems. Routine measurement not complemented by actions is meaningless. Periodic and adequately interpreted growth check-ups, especially during the first two years of life, enable growth deviations to be detected early and mothers taught how to improve feeding practices (Huttly et al., 1991). Growth monitoring is used in all of the region's countries with varying coverage and frequency, but in many it has become a routine measurement which does not perform an effective function as an instrument for supporting decision making, nutrition education, and changes in unsatisfactory food and health behaviors. For growth monitoring to help achieve its nutritional and health objectives, certain conditions should be fulfilled:

- **It should be started early, if possible in the first 15 days of life;** later check-ups often show that unsatisfactory feeding behaviors have already been established which have begun to affect lactation and growth.
- **It should be performed regularly and with varying frequency,** depending on the existence of risk factors. Five or six check-ups during the first year of life and four during the second may be sufficient in a low-risk family. The frequency of check-ups should be increased to the extent that there are risk factors (adolescent mothers, little maternal schooling, deficient environmental sanitation, low income, a large family, a history of malnutrition, etc.).
- **It is essential that mothers and health workers adequately interpret weight gain between check-ups.** Neither the weight obtained nor the nutritional classification at a given time is as important as the trend in the growth curve. The growth graph is standard throughout the region but in few places is it used satisfactorily, and so it loses the function for which it was designed. Nutrition education and the frequency of check-ups should be programmed on the basis of the interpretation of the growth curve.
- **When resources are limited, priority should be given to children under two years, the group in which the greatest nutritional injury occurs.** Observations in various countries show that nutritional injury does not increase significantly after two years.
- **Check-ups should be performed by all members of the health team, given adequate training.** In rural areas with low coverage there have been positive experiences with growth monitoring by promoters from the community itself.

■ **The results of growth monitoring should be tabulated and analyzed at the population level.** Even when all children attending health check-ups are routinely weighed, in almost no country in the region is the nutritional information generated used. After a great effort to perform check-ups, the proportion of children who are malnourished or whose growth rate is inadequate is overlooked. An opportunity is thus lost to measure the magnitude of the problem and evaluate the effectiveness of programs conducted. Systematic evaluation of such information is an effective tool for reorienting established activities and strategies.

The cost of growth monitoring depends on the training of the human resources (wage level) and the yield (number of check-ups per unit of time). On average, staff cost ranges from US \$0.20 to \$0.80 per check-up. In extreme situations when professional staff are used and yield is low, the cost of each check-up exceeds one dollar. The average annual cost of health check-ups for infants under one year is about US \$3.00, and a little less during the second year of life. In cost-effectiveness analyses, this figure should be compared with the cost of a day of hospitalization since an adequate system of preventive control significantly reduces the risk of malnutrition and hospitalization. A hospitalization day in most of the region's countries exceeds US \$20.00 to \$30.00, and a case of diarrhea with dehydration or bronchopneumonia results in an average hospitalization of more than five days. Thus, the cost of performing health check-ups on 50 children for an entire year is lower than treating a single serious episode of diarrhea or respiratory infection.

3. Prenatal care and maternal nutrition

Low birth weight is one of the main determinants of malnutrition and child mortality. Many factors contribute to low birth weight, some of which can be identified and corrected through prenatal care (maternal malnutrition, pathologies of pregnancy, smoking, etc.). The routine performance of early and regular prenatal care is another effective strategy for preventing child malnutrition; services should include evaluation of the mother's nutritional status, nutrition education, food supplementation for high-risk groups, and routine iron and folic acid supplementation for all pregnant mothers. It is important that prenatal care be started early (during the first trimester of pregnancy) and that it be periodic and regular. Four or five check-ups are recommended in a normal pregnancy, and that number can be increased if there are risk factors (adolescent mother, malnutrition, pathologies of pregnancy, etc.).

The importance of maternal nutrition is recognized throughout the region, but in few countries are standards for evaluating nutritional status routinely applied or maternal malnutrition identified at the individual or population level. In part, this is because the most adequate methods of nutritional evaluation, such as the weight:height index (Rosso, 1985), are relatively complicated since they involve determining weight, height, and gestational age. Easier alternative methods (weight gain, upper arm circumference) can be used and interpreted, and these are equally useful in identifying the population at nutritional risk.

It is recommended that some criterion be established for the nutritional evaluation of pregnant women which will identify the population that can benefit most from dietary intervention. The expected effect of food supplementation is greater, the larger the proportion of women with a nutritional deficit before conceiving or insufficient increase in weight during pregnancy. Since this information is not customarily available, it can be estimated indirectly through the proportion of low-weight newborns, which is a clue to maternal nutritional status. If the proportion of newborns with a birth weight of less than 2,500 gm exceeds 10%, a good cost-effectiveness ratio can be expected through nutritional intervention for pregnant mothers.

The cost of a food supplement for pregnant women may be US \$2 to \$4 a month, depending on the kind and amount of foods used. If a supplement is delivered for five months, the overall cost is less than US \$20 per pregnant woman with a nutritional deficit. This amount should be contrasted with the cost of caring for a low-weight newborn and the savings which would accrue because of the lower frequency of morbidity and malnutrition. A financial evaluation made recently in Chile showed an adequate social return on nutritional intervention in pregnant women despite being aimed in part at a population at low risk and with a low prevalence of low birth weight (a 5.3% national average). Generally speaking, food supplementation should be included in the prenatal care of women who are undernourished or have insufficient weight gain. It has been demonstrated that such programs not only improve the nutritional status of mothers and birth weight but also increase demand for health check-ups, which facilitates the prevention and treatment of other problems.

4. Prevention and control of communicable diseases

Activities aimed at preventing and controlling communicable diseases are also very important for improving the nutritional status of the population. The Expanded Program on Immunization (EPI) prevents millions of deaths and diseases which negatively affect nutritional status. Especially important is prevention of measles and whooping cough, which often trigger serious forms of malnutrition. The cost of a child's full immunization is about US \$20, which allows the burden of morbidity to be reduced from 3% to 10%; this proportion is greater the less a country is developed. Immunization programs also provide an opportunity to include vitamin A and iodine supplements for high-risk groups at very modest additional cost. Activities to prevent and appropriately manage diarrhea (environmental sanitation, hygiene education, and oral rehydration therapy) and acute respiratory infections, as well as control of malaria and other communicable diseases, have demonstrated nutritional effects. This component also includes health sector activities to improve the quality and safety of foods, including hygiene control.

5. Dietary management of infectious diseases in children

In developing countries and poor families, children suffer from infectious diseases much of the time, and such diseases have a negative effect on nutritional status as a result of the

decrease in food consumption, increase in health care related expenditures, and losses of nutrients. Significant differences have been shown in the growth of poor children during their first year of life based on the number of diarrhea episodes. The problem is aggravated by inadequate diet management since sick children are often unjustifiably given diets of little nutritional value for extended periods. Better nutritional management during the acute phase of a disease and convalescence is a cost-effective way of improving the nutritional status of the child population. Among the measures that can be recommended are continuous feeding, uninterrupted breastfeeding as is, for example, part of oral rehydration therapy in diarrhea (ORT),² and an increase in the frequency, amount, and nutritional density of foods during convalescence.

6. Prevention and treatment of intestinal parasites

In some areas, intestinal worms infect a high proportion of children of preschool and school age. Among other effects, they produce anorexia, growth retardation, vitamin A deficiency, and anemia. Helminthiasis can be corrected quickly with a single oral dose of a low-cost antihelmintic. Studies of periodic single-dose deparasitization of children have shown notable progress in growth and development, including reduction of the high proportion of asymptomatic infections and improvements in vitamin A nutrition status. Modern drugs do not require determining the species causing an infection and are very effective and innocuous. Reinfestation can be reduced through improvements in environmental sanitation and repeated community treatments. Treatment of school children (one of the most affected groups) costs between US \$0.50 and \$1.00 per beneficiary and is very cost-effective.

7. Treatment of malnutrition

Measures to prevent malnutrition should be complemented by activities to treat sick children. A system enabling malnourished children to be identified is of no avail if it is not supplemented by a mechanism allowing their treatment. Mild or moderate child malnutrition, which is the most common kind of malnutrition, can and should be treated by the family itself. Advanced malnutrition not associated with other pathologies, especially in children older than one year, can also be treated at home. Nutritional treatment services should be limited to serious malnutrition in infants under one year. Dietary treatment is essential in overcoming child malnutrition.

The possibility of achieving satisfactory alimentation with the resources available in a family with a malnourished child is limited, and so alternatives to increasing food availability (food production, food supplementation) should always be explored. Despite these limitations, experience shows that it is possible through nutrition education to redirect part of scarce family resources and better use available foods. To improve the dietary management of malnourished children, it is necessary to strengthen the training of human resources and draw

² Oral rehydration therapy (ORT) consists of the provision of an oral rehydration solution, continuous feeding, and uninterrupted breastfeeding during the acute phase of the diarrhea.

up easily applied standards which will guide primary care personnel, including health promoters and other community agents. Experiences in developing countries demonstrate that suitably trained mothers in communities can themselves bring about major changes in the dietary behavior of other mothers when they act as health promoters.

A seriously malnourished infant less than one year old, especially if the case is complicated by an infection (diarrhea with dehydration, bronchopneumonia, or measles), should be hospitalized in order to treat complications and prevent death, more than to bring about nutritional recovery. Hospitals are not a good alternative for nutritional treatment because of their high cost, their greater risk of nosocomial infections, and their few long-term results. Malnourished children restored to health in hospitals often relapse, especially when there are no mechanisms for later follow-up, educational activities, and family social support. A child should be discharged when its infection is overcome and it begins to regain weight satisfactorily.

Various kinds of nutritional treatment services with different degrees of complexity, effectiveness, and cost have been developed:

- **Daily nutritional treatment services or centers are the most common.** These centers operate for a half-day (sometimes for a full day) five days a week and provide children a varying number of meals, depending on how long they stay (one to three per day). Mothers and community staff are included in the care of the children, which facilitates their education and adoption of better dietary practices. Discharge is determined when a child attains a normal weight:height ratio or after a fixed period. These centers generally use donated foods, and the operating expense is about US \$0.50 per child-day. Complete recovery may average six months at a cost of close to US \$100.

Administration of such centers may be a responsibility of a public agency related to social programs, the Office of the First Lady, an NGO, or a community itself. There should be close coordination with the health sector, however, in defining admission and graduation criteria, treating malnutrition and concurrent pathologies, staff training and supervision, and evaluation of results. Kindergartens and child-care centers also provide an opportunity for supporting the treatment of malnourished preschoolers. In some countries the malnourished have admission priority, which is a good strategy.

- **Closed or 24-hour nutrition treatment centers, such as the CONINs in Chile.** Children remain in these centers until they achieve nutritional recovery. In Chile, CONIN (a non-governmental organization) created a structure with national coverage (about 40 centers and around 2,000 beds) which significantly helped eradicate serious malnutrition. The staff caring for children is partly volunteer but also includes paid professionals (physicians, nurses, nutritionists, social workers, and child-care workers), which results in operating expenses much higher than other alternatives (US \$5 to \$10 per child-day). The cost of treating a case of serious malnutrition exceeds US \$1,000 in this case.

■ **Family snack programs such as COFADE in Chile**, in which a family chosen from the community takes continuing charge of the care of one or two malnourished children until they have fully recovered. As in the programs described above, mothers are trained and integrated into treatment of children, and the social support network is used to change the family environment (employment, food supplementation, low-cost housing, worker training programs, etc.). This alternative has proven effective in treating serious cases of malnutrition at a cost significantly lower than treatment centers of the CONIN type or hospitals. It has the additional advantage of facilitating treatment of children in rural areas.

The costs of the various alternatives vary widely depending on infrastructure, personnel, and the kind and origin of the foods used. The alternatives that cost least can operate for US \$0.50 a day; costs can reach \$10 a day or more when better trained staff are included, and exceed \$30 a day in hospitals. The effectiveness of each system varies: in general, three or more months are needed to treat a child with moderate malnutrition and a longer period for serious malnutrition.

8. Promotion of family food production, preservation and consumption

Under some conditions, family, school, or community produce gardens intended to improve the availability of foods, particularly vegetables and fruits that are good sources of micronutrients (e.g., vitamin A), may be useful. The function of the health sector in directly implementing community or family food production activities is often thrown into question. Experience with family or community produce gardens has varied in the region, although in general it can be concluded that their effectiveness is relatively low, especially when they have been implemented through the health sector. Another activity which may have greater impact is training the population in methods to improve the preservation, preparation, and consumption of available foods as part of nutrition education.

C. **Supplementary feeding**

Supplementary feeding interventions of a wide variety have been traditionally implemented in most LAC countries as part of public assistance to the poor for humanitarian, nutritional or other reasons. They are usually conceived as temporary interventions. The general purpose has been to meet the food needs of persons who can not provide fully for themselves, with emphasis in the most "vulnerable groups" (young children, pregnant and lactating women) and school children. Along with much debate about food as a basic human right, government's role in ensuring access to enough food for those who can not afford it, and concerns about potential welfare dependence, supplementary feeding continues to be widely implemented.

The health system is, in theory, the most appropriate channel to provide supplementary feeding to pregnant and lactating women and young children, the groups most vulnerable to

malnutrition. However, the capacity of the health system to reach those at greatest need is contingent upon its coverage and efficiency. Unfortunately, government health services and, particularly, the primary health care system, in countries with persistently high malnutrition rates have traditionally been too weak, too inefficient and have too low a population coverage to provide basic health care to the most needy. The fact that the maximum expected coverage and impact of health sector supplementary feeding will not exceed those of the primary health care system is often ignored. A common feature of LAC countries that have succeeded in reducing malnutrition to levels of little or no public health significance is the existence of a strong PHC system covering a high proportion of the country's population, with particular emphasis on the poor. In these countries, health facilities have been used successfully as distribution centers for MCH supplementary feeding. Targeting and coverage of high risk population groups may be enhanced through involvement of non-governmental organizations, provided that functional linkages and referral systems to the health system are established.

1. Objectives

The immediate goal of maternal and child supplementary feeding has traditionally been to **increase food consumption** of mothers and children above their regular dietary intake, either directly (direct feeding modality³) or indirectly (take-home modality) through increased food availability to the family. Increased food intake, in turn, is expected to result in **improved nutritional status**. However, specific intra-household food distribution and infant feeding patterns and household responses to increased in-kind income are likely to affect the extent to which food consumption by the target individual increases; sharing of supplementary food among members of the family other than the intended beneficiaries, feeding patterns in the presence of disease, misuse (selling, trafficking) and substitution of foods regularly purchased (reduced family food expenditures) may be obstacles to improving food consumption by target individuals. Other factors related to malnutrition, particularly infectious diseases, may preclude increased consumption from improving nutritional status. This would in part account for the poor response of supplementary feeding alone to improving nutritional status of the recipients (Beaton and Ghasemi, 1982). Nutritional impact also depends on the amount, type and quality of food delivered to the target group, the duration of feeding, the timing of supplementation, the initial nutritional status of the recipients, and the degree of targeting.

Supplementary feeding has traditionally been assigned nutritional improvement objectives (e.g., improved food intake, reduction in childhood malnutrition and low birth weight rates). As discussed earlier, direct nutritional improvement may not be the only, or even necessarily the most important, objective of supplementary feeding. **Health service utilization objectives** may be at least as important as nutritional objectives. More recently, emphasis has been given to supplementary feeding as an incentive to increase the low demand for basic

³ Direct feeding for recovery of moderate-to-severe malnourished children in institutional settings (e.g., hospitals, nutrition rehabilitation centers) is seen as part of regular curative clinical care.

health services and public health interventions by the poor (health service utilization objective) which, in turn, is likely to contribute to improved nutritional status. Disappointment with the nutritional outcome of supplementary feeding programs has apparently triggered the current interest in shifting from purely nutritional into health-related objectives, both of which are indeed legitimate. When the primary objective is to increase demand for basic health services, issues of intra-household distribution, substitution and other diversion of food supplements lose relevancy.

There is growing evidence that properly targeted and implemented supplementary feeding is effective in increasing basic health service demand and utilization, particularly if coupled with improvements in the supply side, e.g., quality assurance and client satisfaction. A sustained impact on the use of services is likely to be achieved by the synergism between supplementary feeding and quality assurance incentives. The effect of phasing out feeding programs on the demand for quality health services has not been evaluated, though. If a high demand for basic health services is not fully sustained through quality assurance and client satisfaction, long-term supplementary feeding may be needed.

Income transfer to the poor has also been proposed as an important objective of supplementary feeding; however, health staff may not perceive income transfer as a legitimate role for health services and may not enthusiastically participate unless health service utilization objectives are clearly incorporated. Undoubtedly, supplementary feeding programs have variable income transfer effects resulting from the release of household resources commonly spent on food; hopefully, these resources may be spent on additional or more nutritious food.

Food as an in-kind resource transfer has been postulated to have some advantages over in-cash transfers (Katona-Apte, 1993): (1) the marginal propensity to increase food consumption is expected to be greater; (2) the additional income from food transfers is more likely to be controlled by women and spent on additional and better quality food; (3) the risk of diversion is lower; (4) nutritionally appropriate foods with low status and little market value or appeal can be more effectively targeted to vulnerable groups and may become self-targeted; (5) food is a more efficient and useful resource when inflation is high, food supplies inadequate or markets inefficient; and (6) food distribution is politically more acceptable.

2. Intended beneficiaries

A critical aspect of supplementary feeding is the definition of intended beneficiaries: poor families, mothers and children, urban vs. rural population, etc. It is well established that the groups most vulnerable to malnutrition are pregnant women and children under two or three years living in the poorest areas (peri-urban and rural); these groups are thus expected to be the main beneficiaries of feeding interventions. In some countries, supplementary feeding programs are concentrated in urban areas due to their great accessibility, logistical advantages, and greater political visibility. Nevertheless, it must be kept in mind that throughout the region, the rural population is most severely affected by malnutrition.

Empirical evidence has shown that supplementary feeding is most likely to have significant nutritional effects (e.g., on physical growth) on children between the ages of 6 and 24 months, a period of physiologically normal rapid growth (Beaton, 1993). Such period is also a critical one in terms of weaning practices and growth faltering. Because of its potential negative impact on breastfeeding, children younger than six months should be excluded, unless the health system has the capacity to identify growth failure (e.g., an effective growth monitoring system) for individual targeting.⁴

There is also abundant evidence on the impact of supplementary feeding during pregnancy on intrauterine growth as measured by birth weight, particularly when provided for more than three months to women with poor nutritional reserves (e.g., low weight for height), as well as on the influence of birth weight on post-natal growth and immunity. Supplementary feeding should be targeted for as long as possible to women with low weight for height (or low arm circumference) during pregnancy and lactation, together with basic health care and health and nutrition education focused on infant feeding and weaning practices.

3. Targeting

Until recently, supplementary feeding planners and implementors were mostly concerned with reaching high absolute coverage rates. In 1991, overall coverage rates for children under five in LAC countries reached 21% (ranging between 1.9% in Haiti and 96% in Chile), and the number of children covered was nearly five times the estimated number of malnourished children in most countries (Musgrove, 1991). This would suggest inefficient targeting. Programs are supposed to focus not only on recuperating malnourished children but also on preventing malnutrition in those at risk; thus, if resources suffice, the target population is expected to be greater than the estimated number of malnourished children. However, financial constraints often dictate the need for more efficient targeting.

Appropriate targeting is critical to supplementary feeding because of equity, cost-effectiveness and efficiency considerations. Targeting is needed to make the best use possible of limited resources by focusing on those at greatest risk or most likely to benefit but who, unfortunately, are not always the same. The question indeed is not whether but how to target, since targeting mechanisms differ in their costs, effectiveness and political attractiveness. Individual targeting usually requires costly administrative apparatus and good cooperation from the target population, yet needy persons may be excluded unless the benefit per person is large enough to encourage eligible people to show up for screening. Too strict targeting may not be politically feasible. Supplementary feeding may be targeted by age, individual need (social/economic or nutritional status), and/or by geographic region. Self-selection targeting may also be used.

⁴ The World Food Program has prepared specific guidelines to ensure that supplementary feeding programs do not interfere with exclusive breastfeeding.

Targeting by age is always desirable, as indicated above, although in take-home programs sharing of supplements among other members of the family may reduce targeting effects on the intended beneficiaries. If the objective of the feeding activity is nutritional, targeting on pregnant women and children 6 to 24-36 months is recommended because the weaning period is known to carry the greatest risk for malnutrition; few cases of malnutrition, if any, develop after 24 or 36 months of age, and anthropometric recovery at older ages is less likely. **Targeting by community, family or individual need** is always important and may entail means testing (verification of individual or household need on social/economic or related grounds, e.g., nutritional status) which may be logistically cumbersome. The efficacy of **targeting by geographic region** may be contingent upon the spacial distribution of poverty and malnutrition; it may be efficient when the most needy are clustered in well-defined geographic areas (e.g., rural areas, urban slums).

Self-selection targeting has been often suggested for supplementary feeding, e.g., by providing food commodities not favored by those at no nutritional risk or by members of the family other than mothers and young children, or to distribute them at sites likely to be attended only or preferentially by the poor (e.g., geographically targeted health clinics). Linking food distribution to the provision of primary health care services (e.g., prenatal care, growth monitoring, immunizations, health and nutrition education) in poor communities has been used for self-targeting. Identification of self-targeted food commodities and development of self-targeted formulated foods (such as weaning foods) deserves further exploration, provided that the cost of the latter is not exceedingly high.

4. Distribution modality

The food distribution modality has important logistical, effectiveness, targeting, management, monitoring and other implications. There are several implementation modalities, the most frequent being: (1) direct on-site feeding with foods cooked or prepared in institutions; (2) distribution of uncooked food commodities to be prepared and consumed at home (take-home modality); or, eventually, to be used in "community kitchens" or in "community day care centers"; and (3) distribution of food-stamps or food-coupons. Each modality has advantages and disadvantages. Regardless of the distribution modality, supplementary feeding other than through food coupons usually involves a large logistic burden for mobilization, transportation, storage and distribution of large amounts of food commodities, with institutional requirements that are often unavailable in developing countries.

Direct on-site feeding is commonly used to assist special groups that can be reached in institutions (schools, hospitals, child care centers, nutrition rehabilitation centers, orphanages, nursing homes). Most governments in the LAC region implement direct on-site feeding of young children for humanitarian reasons or for rehabilitation from severe malnutrition. On-site feeding assures consumption of the allocated ration by the intended recipient, avoiding problems of sharing and substitution of the ration, facilitates continuing surveillance and, because it is highly targeted, may increase cost-effectiveness for nutritional recuperation.

Major disadvantages are the high cost, limited coverage and concentration on single individuals with little, if any, spill-over effects on other members of the family.

Take-home food distribution has been by far the most frequently used in MCH supplementary feeding, through health services (hospitals, health centers), NGO outreach programs or other channels (e.g., mothers' clubs). It consists of periodic distribution of food rations to be prepared at home and consumed by specific individuals, usually pregnant or lactating mothers and young children. A major advantage is the possibility of relatively high geographic and population coverage, less administrative and logistic demands and lower cost per recipient than on-site feeding, and the possibility of linkage with PHC services, including health and nutrition education to mothers. Major disadvantages are the need for extensive distribution, transportation and storage systems and mechanisms to reach those at greatest risk, misuse (selling) and sharing of food rations (usually among family members), and replacement of regular foods, all of which ultimately result in diversion from intended recipients and reduced actual supplementation of the regular diet.

Food stamps or coupons have been used extensively in the United States, and partially or temporarily (mostly as pilot projects) in some developing countries (Sri Lanka, Jamaica, Colombia). The purpose is to provide food-linked income transfers to the poor by distributing coupons of a nominal currency unit entitling the recipient to exchange them for food at retail outlets. In some instances, a purchase requirement, that is, a minimum payment necessary to obtain stamps have been tried with variable success to encourage households to shift their budget allocation to more food. It is expected that coupons would prompt households to buy more food than they would under equivalent cash transfers. The most attractive feature of food stamps is that they do not require the government to directly handle any commodities because of the utilization of normal marketing channels, hence the logistical complexities and problems around food transportation, storage and distribution are avoided. However, the use of existing marketing channels makes food stamps more suitable for reaching urban populations.

Major disadvantages of food stamps are the constraints imposed on recipient choice; the potential embarrassment and stigma attached to their use; large program administration costs; the need for both a system of supplies and outlets accessible to the poor, and retailers acceptance of a parallel currency and willingness to redeem it; and the incentive to engage in illegal behavior (by merchants and participants) to avoid the constraints, which tends to generate corruption. Inflation undermines the value of food stamps and may require adjustments that increase program costs.

Cash transfer coupons have been used in recent years in Honduras, with the support of the World Bank. Even though the basic objective of the coupons is simply cash transfer to the most poor, the program is still carried out (in one of its forms) through the health system and is linked to the delivery of primary health care services. The program is thus expected to increase health services utilization and eventually attain nutritional impact. USAID and LAC

HNS has recently completed a study of the cost-effectiveness of this program, as compared with direct food distribution.

5. Type of food commodities

The type of food commodity used has practical importance in supplementary feeding. Acceptability of supplements by the target population is key to ensure consumption by the target population and reduce misuse and leakages (selling). To the extent possible, food supplements should be selected to match the food preferences of the recipients or, at least, to avoid inclusion of unfamiliar foods that may not be readily accepted. Food commodities most commonly used in supplementary feeding programs in the LAC region are powdered milk, wheat flour, bulgur, corn, corn meal, oats, lentils, cooking oil, rice, sugar, salt, beans and meat. A large number of countries use food commodities donated by the World Food Programme (WFP), the European Community (EC) and USAID (P.L. 480 Title II), which significantly reduces program costs. However, selection of food commodities is often dictated by donor's availability rather than the food preferences of the target population. Furthermore, frequent changes in the availability of specific donated commodities impedes continuity and education to improve their utilization. In the LAC region, traditional foods (rice, beans, oil and corn) are also used, and these tend to be consumed by the entire family.

Foods which are given in greater proportion to young children are those which have the perception of being infant foods, especially flour-vegetable mixes such as Incaparina, Bienestarina, Nutricereal, Panacrema and Sopa-puré. The cost of these products is on the order of US \$0.60 to \$0.80 per kilogram, and a ration of 3 kilograms per month allows for the preparation of two daily servings with a caloric contribution equal to 35% of the daily recommended requirement of a two-year-old child. They also have the advantage of being fortified with micronutrients at a relatively low cost. Another advantage is that their method of preparation and consumption fits with the dietary habits of small children. The monetization (i.e., commercial sale) of donated food commodities has enabled some countries to increase program resources by substituting weaning mixtures with high nutritional value for traditional foods.

Nutrient-dense vegetable mixes are used in some countries, either locally produced (Incaparina, Bienestarina) or donated (CSM, CSB), as well as cereal-milk combinations (oatmeal-milk) and whole milk (Chile). Specially designed products, which have also been used, tend to be too expensive compared with natural foods. Although supplementary foods may also be used as vehicles for fortification with micronutrients, other micronutrient interventions are more appropriate for attaining significant coverage of the maternal and child population.

6. Ration size

When supplementary feeding is intended to meet nutritional objectives (e.g., improve nutritional status/physical growth), the size of the individual ration becomes critical.

Frequently, failure of supplementary feeding to have a nutritional impact has been attributed to insufficient food rations; this is even more important when sharing, substitution and other leakages occur. Ration size affects both cost and potential for nutrition impact. In theory, ration size should be established on the basis of the existing nutrient intake gaps of the intended beneficiaries. Since total calorie intake has been shown to be more limiting than nutrient intake in a number of studies in the LAC region, estimating ration size on the basis of the measured calorie intake (calorie deficit) of the target population may be warranted.

7. Coverage and duration of participation

The coverage of supplementary feeding in a given population is basically a function of the resources available. Population coverage may be as large as the resources suffice. Regardless of the overall coverage, however, targeting is a critical issue for program effectiveness. In theory, population coverage should be at least as large as the proportion of malnourished children in that particular population, and political decisions should be made to allocate adequate resources for that purpose. Under certain circumstances (e.g., availability of donated commodities), population coverage may be larger. Even when total coverage of children under a certain age is larger than the estimated number of malnourished children in that age group, effective targeting to the groups at highest risk is needed for nutritional impact. When supplementary feeding is used as an in-kind income transfer, desirable coverage may be estimated on the basis of the size of the poorest population, contingent upon the resources available.

Supplementary feeding programs with nutritional objectives should establish individual "graduation" criteria to limit the duration of eligibility for participation. In programs targeted to malnourished children, one of such criteria may be recuperation from malnutrition. Individual temporary targeting while growth failure exists has been used successfully to enhance the nutritional impact of supplementary feeding, using growth monitoring to identify children at the early stages of growth failure (high risk of malnutrition). In programs with nutritional objectives, supplementary feeding should be terminated when malnutrition rates drop below a pre-established target. When supplementary feeding is used as an incentive to increase demand and utilization of primary health care services, it may become permanent in the long term, unless the quality of services is enough to sustain the demand or other incentives are implemented.

8. Management and logistics

Supplementary feeding programs require strong institutional and administrative managerial capabilities. Poor management and deficient logistics for food transportation and distribution are by far the most common causes of program failure. Many programs fail to provide for adequate storage facilities and to secure timely transportation of food commodities from central to distribution places, hence supplement distribution is irregular and poorly coordinated and/or integrated with other health and nutrition actions. Attempts to set up large-scale supplementary feeding programs that exceed the existing institutional and

administrative capabilities, without deliberate efforts to strengthen them, have consistently failed.

Local institutions may lack appropriate managerial skills, adequate operational infrastructure for transportation and storage, and well developed and efficient distribution systems; furthermore, the managerial and logistics requirements of such programs are often underestimated. This is one of the reasons advocated for promoting food coupon schemes that use regular commercial marketing and distribution channels, although, as discussed above, such schemes pose other types of operational problems also demanding sound management and logistics. Specific training may be required to develop managerial skills of program planners and implementers and should include full awareness and familiarity with the logistical requirements of program implementation. Besides appropriate planning, strong management and efficient logistical systems are prerequisites for program success that must be developed before programs are launched.

9. Concurrent interventions

It would appear reasonable to expect, and empirical evidence tends to confirm it (Mora et al., 1990), that the nutritional impact be greater when supplementary feeding is complemented with other concurrent actions, particularly effective nutrition education and public health interventions aimed at preventing the occurrence and improving the dietary management of infectious diseases (e.g., immunizations, sanitation, personal hygiene, health education). Therefore, maternal and child supplementary feeding should be implemented primarily through the health system and/or closely linked with the provision of primary health care and public health measures. Targeted programs providing some combination of food, micronutrient supplements, primary health care and health and nutrition education to vulnerable children and their families (e.g., MCH supplementary feeding programs) have been advocated as the core of nutrition in health interventions. The nutritional impact of supplementary feeding is ultimately contingent upon the relative importance of deficient food intake versus morbidity as a cause of malnutrition in a particular setting, as well as upon the extent to which the existing food consumption gap is met by the intervention and to which effective measures are taken to improve the biological absorption of the foods consumed (prevention, control and dietary management of infections).

Some of the most successful nutrition interventions programs have implicitly recognized complementarity of inputs and have linked food supplements to the provision of health care and education, with the additional advantages of increasing economic efficiency of staffing through administrative efficiency and reducing the unit costs per participant. The poor nutritional impact of isolated supplementary feeding interventions has been frequently documented. A common conclusion of program evaluations is that for supplementary feeding to be nutritionally effective, a number of complementary interventions in health and nutrition should be implemented concurrently. This may raise questions as to the potential of supplementary feeding by itself to affect nutritional outcomes, since multiple intervention approaches entail attribution problems. A more balanced interpretation considers that

supplementary feeding provide a concrete input that, when complemented with program interventions addressing other significant restrictions to household and individual food security and nutrition (e.g., poor nutritional practices, poor awareness of the nutritional needs of young children and of the relationship of growth, health and nutrition, high burden of infections), is likely to have greater nutritional impact on prevention and/or recuperation of malnutrition. Integrating food-related programs with primary health care offers great promise because they address several interacting constraints simultaneously.

10. Program costs and cost-effectiveness

Supplementary feeding programs have shown a wide range of costs per beneficiary per year (US \$24 to \$160), in part due to differences in concurrent services provided (education, medical care, growth monitoring) as well as targeting effectiveness. Estimated costs per beneficiary/year in the programs reviewed by the World Bank in 1991 (Musgrove, 1991) ranged between \$10 and \$50, with an average of \$20. Costs per beneficiary and cost-effectiveness may improve by cutting costs without negative effects on nutritional benefits if such cuts are accompanied by better targeting and improved program implementation. Cost-effectiveness could be further improved by strengthening concurrent primary health care and water and sanitation programs. Overall costs may be reduced by designing more focused programs, by improving targeting, and by establishing nominal charges (small amounts) to recipients.

Program costs depend in part on the quantity and type of foods used. A traditional package that includes 3 to 5 kilograms of food has a cost on the order of US \$4-5 per month per beneficiary. The cost is significantly higher when powdered milk is used (around \$4 per kilogram)--a product with high acceptability but high cost per unit of calories or proteins delivered--such that its use is rarely justified. The cost is lower for protein mixes. If the food ration is delivered every six months, the cost per beneficiary is US \$25 to \$30.

11. The role of food aid

A frequent decision confronting policy makers in LAC countries is the extent to which food aid should be looked at or welcome. Besides its justification in emergency situations, food aid has been advocated as a development tool and may be politically attractive to governments facing financial restrictions that reduce their choices. Given that food aid is often one of the few resources freely available for budget balancing in developing countries, national dependency on food donations has steadily increased in a number of LAC countries.

As a result of its advantages and disadvantages, food aid has advocates as well as detractors. A major advantage is low cost. An additional advantage is the availability of donated micronutrient fortified foods, particularly from P.L. 480 Title II. Among the real or apparent disadvantages are: (1) potential disincentive to local food production, presumably contingent upon the type and total amount of foods commodities donated; (2) changing recipient preferences from locally available foods to commodities that need to be imported

using foreign currency; (3) limited or no choice of food commodities to match local preferences; and (4) eventually, persistent country and government dependency on donated commodities for their nutrition programs. Recipients' dependency is a potential risk if supplementary feeding and food stamp programs are not designed in such a way that lead to a situation where they are not longer needed. The challenge is to use food aid as a development resource to increase access to food in the short run while developing the poor's capacity to obtain the food needed without food aid in the long run, by promoting self-sustained income-generating capacity, e.g., by using food along with technical assistance and credit to facilitate the development of small-scale enterprises and other self-help activities, and programs to increase the productivity of women's time within and outside the household (Pinstrup-Andersen, 1988).

In any case, food aid should be seen as an instrument of support for food security and as a temporary resource that sooner or later should be phased-out; if supplementary feeding programs continue to be needed, responsibility for the provision of food commodities should be gradually transferred to the government, using locally available foods. Such transition from food aid to the use of locally acquired food commodities is a policy issue that should be given proper consideration as early as possible, and the appropriate resources allocated accordingly. The ultimate goal will be to reduce or overcome a country's dependence on food aid for national food security and for maintaining a safety net of social and nutrition policies and programs.

Innovative uses of external food aid need to be developed that offer opportunities for funding social programs while protecting farmers from adverse effects. Food aid may be used directly in supplementary feeding programs, or it may be monetized by the recipient government and the proceeds used to cover administrative costs of the same programs or to fund a variety of other related nutrition, community development and income-generation initiatives. Monetization is strongly promoted by donors and increasingly used in the LAC region, where significant experience is now available.

D. Prevention and control of micronutrient deficiencies

Micronutrient deficiencies of vitamin A, iron and iodine, and possible other vitamins and minerals often unmeasured, are increasingly recognized as significant public health problems in the LAC region, especially in USAID-assisted countries. Micronutrient malnutrition occurs even in the face of adequate energy and protein intakes and is more widespread than energy-protein malnutrition. While vitamin A deficiency is mostly sub-clinical in the LAC region, iron deficiency is severe enough to be responsible for a high prevalence of nutritional anemia among young children and women of reproductive age, especially pregnant and lactating women. The well known functional implications of marginal vitamin A and iron deficiency on child's health and development, and on adult productivity, are serious enough to justify immediate action in practically all countries. However, there is a need for more intensive information dissemination at all levels to sensitize decision-makers, generate

awareness among the general population and foster the social mobilization needed for stronger government political commitment to action, private sector support and community demand for micronutrient interventions.

WHO has recently proposed criteria to assess the public health significance of micronutrient deficiencies of vitamin A, iron and iodine, as follows: for vitamin A, when the prevalence of low serum retinol (20 or less micrograms per deciliter) among children under five years of age is 10% or higher, compounded with clinical, epidemiological or dietary information; the prevalence of iron deficiency anemia is seen as severe (requiring urgent action) when greater than 40%, moderate (action needed) when 10-39%, and mild (not a high priority) when less than 10%; similarly, iodine deficiency is a severe problem needing urgent action when the endemic goiter prevalence is over 20% or urinary iodine concentration is less than 2 micrograms/dl., moderate when goiter is 5-10% or urinary iodine is 2.0 to 4.9 micrograms/dl., and mild when goiter is less than 5% or urinary iodine is 5.0 to 10.0 micrograms/dl.

The two immediate causes of micronutrient deficiencies are deficient availability and consumption of micronutrient-rich foods, and parasitic and infectious diseases affecting bio-availability and utilization of ingested micronutrients. Frequently, deficiencies of different micronutrients are found to be associated; however, because of their being so largely related to specific feeding patterns, the epidemiological features of micronutrient malnutrition in a given population may differ from that of energy-protein malnutrition and affect greater numbers of the population. Such is the case with iron deficiency, which is the most prevalent micronutrient deficiency and which is, even in its most severe form of anemia, generally more common in children than protein-calorie malnutrition.

Micronutrient policies should address both supply and demand factors through a combination of interventions, rather than relying on a single intervention (World Bank, 1994). Since populations at risk tend to overlap and a number of interventions address more than one micronutrient, there are important complementarities in addressing several micronutrient deficiencies simultaneously. However, some interventions are highly effective when implemented as free-standing efforts targeting a specific micronutrient, such as salt iodination; even in this case, however, multiple fortification may be feasible and effective. It is always important to identify the optimum combination of interventions for each particular country or setting. Any optimal strategy should be multi-sectoral involving several government sectors (health, education, economics, trade) and the private sector (e.g., food industry, NGOs).

Improved availability of micronutrient-rich foods may be achieved through either agricultural policies providing incentives for production and marketing of specific food (see the Agriculture Module of these Nutrition Policy Guidelines), fortification of staple foods, and specific efforts to promote community and household production. Improving consumption of micronutrient rich foods requires good knowledge of factors that facilitate and constraint dietary diversity. In particular, behavioral modification is needed to improve feeding

patterns resulting from assigning low status and prestige to vegetable sources, especially green leafy vegetables and sources of vegetable iron, which may account for the poor's low propensity to increase intake of micronutrients (especially precursor sources of vitamin A) with increased income. Micronutrient content is, indeed, often a hidden property of foods.

The ultimate objective of micronutrient policies is to increase consumption of micronutrients. This may be achieved through a combination of short and long-term micronutrient interventions, including direct provision of them to individuals at high risk (therapeutic and/or preventive supplementation), a number of "food-based" interventions aimed at fortification of staple foods consumed by a large proportion of the country's population (including donated food commodities), and the promotion of dietary diversity (see Box 3).

BOX 3

PREVENTION AND CONTROL OF MICRONUTRIENT DEFICIENCIES

1. SUPPLEMENTATION

- Therapeutic
- Preventive
- Universal coverage
- Targeted

2. FORTIFICATION

- Single
- Multiple

3. DIETARY DIVERSIFICATION

- Production and marketing
- Conservation
- Consumption

4. PUBLIC HEALTH MEASURES

- Prevention, treatment and dietary management of infectious diseases (EPI, ORT, ARI, etc.)
- Periodic de-worming

Dietary diversification strategies include a range of approaches to modify food choices and improve production, availability, storage, preservation, preparation and consumption of natural foods rich in micronutrients. Increased consumption of natural dietary sources of micronutrients usually requires changes in dietary patterns through intensive long-term

education and communication efforts. A number of public health interventions such as immunizations, environmental sanitation, prevention and appropriate dietary management of infectious diseases (e.g., diarrhea, acute respiratory infections, measles) are also likely to have a impact on micronutrient nutritional status.

1. Micronutrient supplementation

Conventionally, the term micronutrient supplementation has encompassed therapeutic use of high doses of a specific micronutrient to treat clinical cases of deficiency (e.g., xerophthalmia, anemia, endemic goiter) or certain diseases responding to them (e.g., vitamin A for measles, severe malnutrition, and prolonged diarrhea), that is, **therapeutic supplementation**, as well as periodic distribution of micronutrient supplements for prophylactic purposes to protect population groups at high risk of deficiency, or **preventive supplementation**.

Therapeutic supplementation should be instituted routinely as part of the treatment of specific diseases and included in health care protocols regardless of the significance of micronutrient deficiencies in the country. Universal or targeted preventive supplementation would be indicated when the magnitude of a specific deficiency reaches public health significance in all or even part of the country. Supplementation should be conceived of as a short-term, temporary intervention to be implemented until other longer-term and more sustainable interventions (e.g., fortification, dietary diversification) are effectively put in place.⁵ Targeted supplementation may focus on geographic areas or population groups not usually reachable with other interventions, e.g., not consuming fortified foods (such as iodized salt, fortified sugar). Geographic clustering of iodine and other deficiencies often calls for targeted supplementation.

Micronutrient supplementation programs have suffered from a number of logistical and operational problems leading to irregular implementation and decreasing population coverage. Common problems relate to procurement and supply management (vitamin A and iodine supplements usually need to be imported), storage and distribution logistics (inventory control, timely resupply), technical norms, supervision, record keeping and information systems, training and support of health workers, staff commitment, and population demand and compliance (iron supplements). Supply problems may be even more important than noncompliance as a cause of iron supplementation failures (Schultink et al., 1993). In order to reach and maintain high coverage rates, a number of delivery channels can be used, including already established public health programs (e.g., the Expanded Program on Immunizations), the school system, agricultural extension agents, religious leaders and private pharmacies.

⁵ Nevertheless, routine supplementation with iron and folic acid for pregnant women should continue even when permanent fortification or dietary diversity interventions are in place.

Micronutrient supplementation programs require the establishment of adequate systems for procurement, supply and distribution of supplements, the establishment of clear technical norms, systematic training and supervision of health personnel, and a functional information system in which supplement delivery is adequately and regularly registered and the information transferred to tally sheets that permit estimation of program coverage and quality. A procurement mechanism has been established by which UNICEF facilitates procurement of vitamin A and iodine supplements using foreign currency to be then reimbursed by governments in local currency. Failure of vitamin A or iron supplementation programs to sustain high population coverage is often the result of irregular supply of supplements at the national, district and local levels.

Supplementation programs tend to be popular and attractive for political reasons (high visibility), thus a number of countries have engaged in those programs to the detriment of other more sustainable interventions. Micronutrient supplementation has advantages as well as critical aspects (see Box 4). It should be kept in mind that, even when properly implemented, supplementation alone does not provide a permanent and sustainable solution for micronutrient deficiencies. The theoretical advantage of being able to target the highest risk population is often, in practice, counteracted by the low coverage of health care services and their inability to reach those at greatest need. This problem may be partially circumvented by involving NGOs in supplementation activities to reach geographic areas and population groups not usually covered by regular health services, although their population coverage is usually low. Both the regular health system and a network of NGOs are suitable channels to reach those population groups not usually covered by more universal and permanent interventions such as food fortification (e.g., those who do not regularly consume fortified foods).

Vitamin A supplementation may be considered whenever vitamin A deficiency is a problem of public health significance in part or all the population. Preventive vitamin A supplementation may be universal, that is, directed at the entire population at risk of deficiency because of their age and/or physiological status (e.g., children under 5 years of age and women after delivery), or more narrowly targeted to certain geographical areas or socioeconomic groups. The preventive supplementation scheme recommended by WHO is: one dose of 100,000 IU for infants 6 to 11 months of age (or weighing less than 8 kg.); 200,000 IU every 4-6 months for children older than one year of age; and 200,000 IU once for women within 4 weeks after delivery (this will benefit the breastfed infant during at least the first six months through increased vitamin A content of breast milk). The cost of vitamin A supplementation is extremely low: while the cost per capsule of 200,000 IU is about US \$0.02, and estimated costs per beneficiary range between \$0.42 and \$1.86, and the cost per DALY, based on the mortality reduction effects found in countries with significant vitamin A deficiency, is only \$6.00, one of the lowest among public health interventions.

Universal iron (and folic acid) supplementation of pregnant women is recommended in all cases, since iron requirements during pregnancy are not likely to be fully met from dietary sources. When iron deficiency anemia affects at least one third of a population group, iron

BOX 4

ADVANTAGES AND CONSTRAINTS OF MICRONUTRIENT SUPPLEMENTATION

ADVANTAGES

- Short-term effects
- Relative low cost
- Visibility

CONSTRAINTS

- Procurement
- Complex distribution logistics
- Acceptability
- Dosage and bioavailability
- Toxicity/secondary effects
- Declining coverage
- Individual records
- Sustainability

deficiency is presumed to be practically universal; in this case, **universal iron supplementation of reproductive-aged women and young children** may be more cost-effective than screening for therapeutic treatment of anemia.⁶ Selective screening of suspected individuals from other groups may be more cost-effective than regular screening; indeed, for vitamin A and iron, the cost of screening may exceed the cost of presumptive supplementation.

Routine preventive iron supplementation of young children should be implemented in countries where iron deficiency anemia in this age group is a problem of public health significance. Iron supplementation programs often fail to attain high coverage and continuity, due to supply (iron supplements generally can be obtained locally) and distribution problems as well as to poor compliance associated with frequent side effects of daily doses. Recent evidence of the advantages of weekly over daily dosage of ferrous sulphate (the least expensive of highly bio-available iron supplementation compounds) is opening new possibilities for iron supplementation. Indeed, both in women and young

⁶ For instance, while a hemoglobin test costs about \$1.00, the yearly cost of supplementation with a weekly dose of ferrous sulphate is less than \$0.50.

children, a weekly dose has resulted in similar hematological response to that of a daily dose, with the additional advantage of reducing side effects and overall costs and increasing compliance (Gross & Schultink, 1994; Liu, et al., 1995). While there is still some controversy over this issue, in the future, iron supplementation protocols are likely to shift from daily to weekly doses. If this is the case, the corresponding technical norms should be revised and health personnel retrained. The annual cost of daily iron supplementation per beneficiary can range between US \$2.65 and \$4.44. The cost per DALY gained has been estimated at \$12.80. Weekly supplementation would reduce the costs of iron supplements and significantly improve compliance.

After relatively successful iodine deficiency control programs in the LAC region, endemic goiter is usually clustered in some specific communities where iodized salt is not consumed by the majority of the population. **Iodine supplementation** should be implemented in those communities, concurrently with efforts to increase consumption of iodized salt. Target communities may be selected through the identification of goiter cases attending clinical facilities, estimation of the proportion of households consuming non-iodized salt, or assessment of endemic goiter (thyroid palpation) or of urinary iodine excretion in samples of school children. The product of choice for iodine supplementation appears to be Oriodol in yearly doses of 616 mg. for school-aged children and adults, at a cost of about \$0.50 per year. UNICEF may facilitate procurement of iodine supplements.

2. Fortification of staple foods

Micronutrient fortification of widely consumed processed foods represents one of the most effective means to improve consumption of micronutrients. Fortification of staple foods is one of the most cost-effective interventions to prevent and control micronutrient deficiencies in populations at risk. While it is practically the only sustainable option for iodine deficiency, it is seen as an integral component of a package of multiple interventions to address other micronutrient deficiencies. Fortification of food has greatly contributed to eradicating micronutrient deficiencies in industrialized countries. In those countries, food fortification has become both a quality requirement for certain foods and an effective "nutritional insurance" to protect the population from eventual declines in consumption from natural sources.

Micronutrient food fortification has advantages as well as constraints (see Box 5). A major advantage over other micronutrient interventions is that it does not require significant changes in feeding patterns to be effective. However, in most developing countries, political commitment is still weak and identification of suitable vehicles for fortification is sometimes difficult; but, as dietary habits change rapidly with urbanization, local food industries develop and processed foods become more widely available, fortification will become more feasible in LAC countries. The cost of fortification per person covered is as low as US \$0.14 to \$0.29 for vitamin A in sugar, \$0.10 to \$0.84 for iron in salt or sugar, and \$0.04 for salt iodination.

BOX 5

ADVANTAGES AND CONSTRAINTS OF MICRONUTRIENT FORTIFICATION

ADVANTAGES

- High coverage
- Social acceptability
- Demonstrable effect in the medium term
- No changes required in dietary habits
- Minimal risk of toxicity
- Relative low cost (as % of price of final product)
- Optimal cost-effectiveness

CONSTRAINTS

- Selection of food for fortification
- Motivation/commitment of producers
- Legislation
- Adaptation/development of technologies
- Procurement/cost of fortificant
- Use of foreign exchange
- Monitoring/quality control
- Sustainability

Some LAC countries have made significant progress in single nutrient fortification of a few staple foods (salt, sugar, wheat flour, corn flour, pasteurized milk, margarine), but fortification is still not implemented to the extent it should, despite the fact that it is socially acceptable and affordable, does not require changing food habits, can be introduced quickly, has readily visible effects, can be legally enforced, and it is relatively easy to monitor and make sustainable. Simple, low cost fortification technologies are readily available for practically all micronutrients and may be easily adapted to local conditions and implemented at a remarkably low cost that could be transferred to the consumer. Government costs of fortification are usually restricted to quality monitoring.

There are vitamin A, iron and iodine fortification technologies available for a large number of potential vehicles: liquid milk, powder milk, wheat and corn flour, rice, vegetable oil, margarine, sugar, monosodium glutamate, beverage powders and sugar for vitamin A; powdered milk, wheat and corn flour, rice, salt, sugar, margarine, water and beverage

powders for iron; and salt and water for iodine. Rather than availability of fortification technology, the most common problems relate to promotion of political commitment and identification of appropriate food vehicles that are widely consumed in significant amounts by the target population, e.g., the urban and rural poor. This is often a problem in predominantly rural populations with high consumption of home-processed foods (corn flour, tortillas) and low consumption of centrally processed foods that would be appropriate vehicles for fortification; in some cases, such foods are mostly consumed by middle to high income urban groups which are not usually at high risk of micronutrient deficiencies.

Single or multiple micronutrient fortification is justifiable when micronutrient deficiencies reach public health significance and appropriate vehicles can be identified. Before a policy decision is made, however, the technical and economic feasibility of fortification should be assessed. First, an appropriate vehicle for fortification needs to be identified which: (1) is widely consumed in significant amounts by the population, particularly by those at highest risk, (2) does not have a wide variation in intake between individuals, and (3) is centrally processed in a relatively small number of producing plants. Next steps include: (1) generating political commitment in both the public and private sector (food industry), (2) developing and implementing proper legislation through a concerted action with the food industry, (3) fostering quality assurance and industry competition for quality as a means to secure sustainability, and (4) establishing a functional enforcement and monitoring system. Voluntary compliance with legislation and quality-based competition may be developed and appear to be more effective than mandatory enforcement alone; legislation without food industry commitment is not likely to succeed.

After problem documentation, sensitization and identification of appropriate food vehicles, a policy decision on fortification is usually the result of advocacy and a systematic process of policy dialogue involving both the public and private sectors (food industry). The aim is to reach a formal consensus and generate firm government and food industry commitment leading to the development and implementation of proper legislation. Rather than food-specific legislation, it is often advisable to pass general fortification legislation empowering the Ministry of Health to establish and monitor regulations on specific foods to be fortified, types of nutrients and levels of fortification, price policies, quality control, monitoring and law enforcement regulations. Attempts to have food producers cover the cost of fortification have proved unrealistic; usually, the marginal cost of fortification is low enough (often less than 2% of the retail price of the unfortified product) to be transferable to the consumer as part of normal price increases associated with inflation.

Common constraints are the timely acquisition of fortificants (mostly imported) and the availability of mixing equipment that often needs to be especially built to match particular plant specifications. Government regulations are needed to prevent red tape and facilitate procurement of fortificants exempted from import duties. Locally relevant technical assistance is often needed for adaptation of existing fortification technology, cost estimations, feasibility analysis, and design and implementation of functional monitoring systems. INCAP/PAHO, USAID/OMNI, and UNICEF are important sources of technical support for

fortification programs. Food producers who are willing to comply with fortification regulations and committed to quality products are likely to request technical assistance and staff training in fortification technology, equipment acquisition, quality control and labeling, and the government should be prepared to provide it readily.

Multiple fortification may be considered in some cases, after careful consideration of its advantages and constraints (see Box 6). Fortifying more than one food staple has the advantages of requiring a lower concentration of fortificant in each food, thus reducing fortification costs. Fortification of a single food with more than one micronutrient would be advantageous if there is a need to address several micronutrient deficiencies simultaneously at a minimum additional cost, since the marginal cost for each additional micronutrient is only a small fraction of the cost of fortifying with a single nutrient. Critical aspects to be considered are potential incompatibilities between nutrients (e.g., at a certain ratio, iron and zinc may interfere with each other's absorption), difficulty of identifying more than one suitable vehicle, and arguments about justifying fortification with nutrients whose deficiency has not been assessed or does not reach public health significance given conventional criteria.

BOX 6

ADVANTAGES AND CONSTRAINTS OF MULTIPLE FORTIFICATION

ADVANTAGES

Several Vehicles

- Lower level of fortificant in each vehicle
- Lower cost per vehicle

Several Micronutrients

- Minimal additional cost
- Simultaneous control of multiple deficiencies

CONSTRAINTS

- Potential incompatibility
- Difficulty of identifying several vehicles
- Variable risk of specific deficiencies

Effective micronutrient fortification require a functional monitoring and evaluation System. Government monitoring systems tend to be inefficient in LAC countries, and this accounts for most program failures. A proper monitoring system would include quality control of the fortificant premix preparation (fortificant potency is usually guaranteed by the producer) and of the addition of the pre-mix to the food at the most appropriate site through the production process, as well as analysis of random samples of the fortified food at the production plant, at retail stores and in households. Centralized production of fortificant premix has proved feasible and advantageous in Central America. Quality control at production sites should be the responsibility of the food producers themselves. A specific government unit, often the Food Control Division of the Ministry of Health, may be responsible for monitoring food fortification at production plants, retail stores and households, which requires the design of a specific system securing periodic monitoring at a given frequency using a statistically appropriate number of samples and the timely use of the information. Fortification of foods with specific micronutrients should continue until the consumption of foods naturally rich in the micronutrient meets the needs of the majority of the population, as measured through dietary surveys using statistically representative samples.

3. Dietary diversification

The term "dietary diversification" encompasses a large number of mid- to long-term multi-sectoral interventions aimed at increasing production, distribution, preservation, preparation and consumption of natural food sources of micronutrients. Dietary diversification and food fortification comprise the so-called "food-based approach," which is being given increasing emphasis relative to temporary short-term measures such as supplementation, since it is expected to be more sustainable in the long-term. Although the health sector has a limited role in direct promotion of food production and distribution/marketing, it may play an important advocacy role to promote proper agricultural and other sectoral policies (see the module, *Food and Nutrition Policies in Agriculture*).

Dietary practices may be improved through educational and other interventions aimed at improving food preservation and preparation and, particularly, increased consumption of micronutrient-rich foods, including those being fortified. This will require special efforts in information dissemination, removal of social/cultural barriers, and a well-designed and implemented communication and education strategy aimed at dietary behavior modification to positively change dietary practices, particularly those of pregnant women and young children. Box 7 summarizes major advantages and constraints of dietary diversification.

The potential of nutrition education to improve intake of micronutrients from natural sources appears to be greater for vitamin A than for iron or iodine. Income elasticity of vitamin A intake has been found to be lower than that of energy and even iron; this has been attributed to low status and prestige enjoyed by vegetable sources of vitamin A, which tend to be relatively inexpensive but infrequently consumed. A key objective for nutrition education is to increase the prestige of these foods. It is only above a certain level that increased income may lead to significant increases in iron, protein and vitamin A intake, as a result of greater

BOX 7

ADVANTAGES AND CONSTRAINTS OF DIETARY DIVERSIFICATION (PRODUCTION, CONSERVATION, PREPARATION, CONSUMPTION)

ADVANTAGES

- Long-term solution
- Theoretically self-sustaining
- Apparent low cost

CONSTRAINTS

- Multidisciplinary intervention
- Resistance to change
- Economic constraints
- Cultural traditions
- Appropriate technology
- Educational methodology
- Cost-effectiveness
- Sustainability

consumption of foods of animal origin that are usually more expensive. Changing dietary patterns is a difficult goal that can be reached in the long term as a result of an intensive education and communication process but which, once attained, is relatively permanent.

Combining participatory and interactive interpersonal education approaches (popular education) and social marketing techniques appears to be most effective in eliciting sustainable modifications of dietary practices. Modern communication techniques, such as those of social marketing, can help to achieve behavioral changes in the medium term when they can be directed at specific critical behaviors and when it is possible to identify a product whose consumption can be promoted. To induce permanent changes, there is a need for the development of a systematic educational process that leads to reflection and conscious change of dietary habits; social marketing techniques can provide important support for such long-term changes as well.

Data on costs and cost-effectiveness of dietary diversification programs to improve consumption of micronutrient rich foods are scanty. Often, they are restricted to evaluations of home gardening projects implemented by NGOs. A recent assessment by LAC HNS in Guatemala estimated the cost of home gardening per person covered at US \$1.60, at \$1.83

per beneficiary and \$4.16 per beneficiary whose vitamin A consumption gap was filled. In this study, cost-effectiveness of home gardening was the least attractive compared with vitamin A supplementation and sugar fortification. However, the study did not estimate other possible benefits from family gardens than vitamin A consumption.

4. Public health measures

As discussed elsewhere, effectively implemented public health measures will greatly contribute to general nutritional improvement and, in particular, to prevention and control of micronutrient deficiencies. Most noticeable for their nutritional impact are measures to prevent and control infectious diseases, particularly diarrheal diseases, acute respiratory infections, malaria, intestinal parasites, and diseases that can be prevented by immunizations. Such measures include clean drinking water supply and sanitation, immunizations, oral rehydration therapy, malaria treatment and prophylaxis, and control of intestinal parasites (e.g., periodic de-worming), in addition to general health and nutrition education.

Two specific public health measures with significant potential to improve micronutrient status are periodic de-worming and education to improve the dietary management of diseases in children. Intestinal parasites (helminths) have been shown to have negative effects on both iron and vitamin A levels, and there is strong evidence of the positive impact of periodic de-worming on reduction of iron deficiency anemia and improvement of vitamin A status. Periodic de-worming is now facilitated by the availability of single-dose medications such as Albendazole. In endemic areas, malaria prophylaxis and case treatment will contribute to reduce the rates of anemia.

Inappropriate dietary practices associated with infectious diseases of children, particularly diarrhea, are important contributors to poor nutritional status; therefore, positive changes in such practices (e.g., securing continued feeding and uninterrupted breastfeeding during the acute phase, and increased feeding during convalescence) are likely to contribute to prevention of malnutrition and micronutrient deficiencies.

E. **Information, education and communication in health and nutrition**

All countries, regardless of their level of development, need to develop and implement policies and strategies for information, education and communication (IEC) in nutrition and health. The basic objectives for such policies and strategies are two-fold:

(1) Disseminate information and raise awareness among the different levels of society, increase political commitment of the government and the community, and stimulate the necessary social mobilization and participation to promote nutritional and dietary concerns as an integral part of self-care and a "health culture."

(2) Facilitate positive dietary and nutritional attitudinal and behavioral changes in the population, using the most appropriate communication channels and media.

Inappropriate dietary practices constitute one of the main risk factors for malnutrition. Individual behavior does not change simply through the transmission of scientific information and knowledge on diet, nutrition and health. Nutritional education in and of itself does not lead to improved nutritional status of the population if it is not complemented by ongoing, mutually reinforcing, concerted intersectoral actions. Nutrition and health education, based on a thorough understanding of the population's socio-cultural characteristics, are in a sense facilitating processes that lead to the creation of positive individual and collective conditions that in turn enable the adoption of new behaviors. As a directed process either within or outside the health delivery system and using different modalities, nutrition and health education should develop participatory methodologies which:

- promote reflection and analysis and the exchange of experiences through individual or group activities,
- put in doubt practices which positively or negatively affect nutritional status and therefore, health, which have been acquired through social learning or culturally assumed, and
- develop new knowledge which becomes integrated into daily activities and practices as a result of positive experiences which its application, especially by mothers and young children.

The sociology of learning places emphasis on the **educational process**, which implies conscious breaks or lapses in individuals' daily experiences. As a new behavior is internalized, it affects individuals' cognitive structures of cultural and social significance, which in turn must incorporate the new knowledge so that it becomes a routine practice. In contrast to expectations of short-term changes through behavioral modification with dramatic measures, educational processes are slow, gradual and progressive. It is thus essential that politicians, officials, legislators and international cooperation agencies, as well as planners, educators and communication specialists who are interested in nutritional and health problems understand those factors which affect the quality of educational processes and the time that it takes to achieve realistic goals.

Mass media communication provides a valuable complement which creates the necessary conditions at different levels to facilitate nutrition and health education activities. Through modern techniques of **social communication**, technical information may be disseminated to decision-makers and to the public to sensitize them as to the magnitude and importance of nutritional problems and their social and economic costs, thereby strengthening political commitment for the development and implementation of feasible policies and interventions. Communication media, through various channels, use educational materials and messages to interact with the target population through combined educational strategies. The goal is not to satisfy the "consumer needs" of the population but rather to facilitate an educational process directed at the conscious adoption of changes to improve the quality of life. Nutrition and health educators should keep in mind that the use of any communication

medium must be tailored to the educational requirements of the learning process. For educational materials and communication channels to maintain their effectiveness and not bore or desensitize their audience, a variety of techniques must be creatively used.

The following strategies and actions can help to enforce these recommendations in the countries of the LAC region:

1. Ministries of Health should define national food and nutrition IEC policies which are integrated with food security policies and with maternal and child health and nutrition programs, in the context of primary health care, in order to avoid poorly planned educational interventions.
 - Establish operational and methodological criteria for adapting and translating national policies into nutrition and health educational and communication interventions at the regional, community, local and family levels.
 - Focus integrated nutrition education activities on ongoing programs that meet equity concerns, especially those directed at pregnant women and adolescents, to link fertility with the prevention of nutritional problems.
 - Develop public health priorities that include: nutritional education for pregnant women; the use of prenatal care to systematically educate mothers; growth monitoring and development, using the infant growth card as an instrument of health education from birth and providing counseling to mothers with messages tailored to the child's growth curve; lactation management and labor legislation to support breastfeeding; counseling and clinical management of malnourished children; supplementary feeding emphasizing locally available foods; supplementation with micronutrients; dietary management during and after illness episodes, both in the health facility and at home; hygiene and basic sanitation.
 - Develop "dietary guides" for the different age groups which are adapted to the conditions of each country and region and which enable the preparation of combinations of locally available foods to meet the nutritional needs of specific groups within existing economic limitations.
 - Establish a permanent system of consumer information and guidance concerning the selection and identification of relatively low cost foods with high nutritional value, using the most culturally accessible means (e.g., radio) to transmit periodic bulletins. A good example of this is the initiative of the Instituto de Investigación Nutricional in Peru to periodically inform consumers of the "best buy," based on price and nutritional quality.

2. Central governments should encourage the development of IEC plans at the regional level, stimulating local interest in dietary/nutritional problems, especially in the context of decentralization processes which are occurring in many countries.
 - Develop methodological guidelines to conduct participatory regional and community assessments to identify the most prevalent nutritional problems in the maternal and child group and the cultural factors which affect nutrition and health, guide analysis of the magnitude and importance of nutritional problems, and help make the most rational use of resources with concerted actions by local organizations.
 - Provide training guides to facilitate the use of local indicators of nutritional status, especially for the maternal and child group, so that nutritional epidemiologic surveillance systems can be more useful for regional planners for setting goals and designing, carrying out and evaluating sectoral food and nutrition plans in which the local community feels it is both the focus of the problem and part of the solution.
3. International cooperation agencies can provide technical assistance and the central level in the countries can provide the resources to conduct workshops for producing educational materials which take into account cultural, ecological, ethnic and linguistic differences which condition dietary and nutritional practices. Such workshops can help develop local capacity for addressing nutritional and maternal and child health problems.
 - Train human resources in the conduct of **qualitative research** methods, such as focus groups and in-depth interviews, which allow them to identify the knowledge, practices, feelings, fears and motivation of the population on which to base educational messages, select communication channels, and design and test educational materials which are consistent with local traditions, preferences and available resources.
 - Train technical personnel in the use of the **social marketing** approach as a complement to interpersonal channels and media, especially in focused campaigns with messages aimed at overcoming social and cultural barriers (fears, prejudices, susceptibilities) related to dietary and nutritional practices, e.g., recognition of the value of native foods in feeding a sick child. Ensure that service delivery institutions conduct qualitative formative research and quantitative baseline studies to assess practices before, during and after exposure to interventions in order to demonstrate the effectiveness of nutrition education in changing behavior.
 - Train personnel from the education, agriculture and health sectors in the appropriate use of materials.

- Ensure follow-up of the use of materials in pilot health areas to assess their impact, not only on knowledge, but on the adoption of new dietary and nutritional practices which are reflected in changes in indicators.
- 4. Design in-service training activities for health personnel using worksheets, short self-teaching theoretical-practical modules, and on-the-job coaching in the application of methodological skills in counseling mothers during routine consultations, stimulating changes in hospital practices in support of breastfeeding and ambulatory management of sick children, and integrating nutrition education in other primary health care activities.
- 5. Continue non-formal nutrition education activities for adults, promoting bilingual literacy efforts for women and taking advantage of new opportunities and agents for improving the coverage of efforts to prevent malnutrition and health problems, monitor them, and provide timely referral of nutritional problems.
 - Take advantage of educational reforms which are being carried out in many countries of the region to integrate relevant social competencies in health and nutrition into primary, secondary and other curricula to enable students to acquire practical knowledge which will help them to meet their basic development needs and improve their quality of life.
 - Train primary school teachers to actively monitor the nutritional status of their students so that they can detect and refer cases at risk of, suspected of or confirmed with nutritional problems that can affect health and learning potential. Also train teachers in the management of supplementary feeding and de-worming medications in school populations.
 - Review and develop student texts, teacher's guides and teaching aids (games, videos, flip charts, slides) that support teaching on food, nutrition and health of children, adolescents and pregnant women.
 - Support in-service training courses in the regions for active teachers and teachers in training on learning methods based in reflective experiences of the students themselves (instead of memorization, which is centered on the teacher), popular wisdom and the solution of local health problems. Such learning methods can be complemented by the development of school gardens, the organization of youth brigades, the participation of parents' and civic groups, and coordination with the local health services and NGOs, such as in the healthy cities initiative.
 - Institutionalize nutrition and health education in waiting areas of outpatient facilities, maternity wards and hospitals, using personnel (including physicians) on a rotating basis.

6. Use low-cost alternative communication media and minimedia which can be used by the population itself. The development of such communication activities constitutes a motivational and positive learning experience which predisposes individuals to behavioral changes which are favorable to health and nutrition.
 - Make use of local radio stations, combined with marketing techniques, fairs, forums and contests. The indiscriminate use of posters is not recommended because these tend to use propagandistic slogans on health and nutrition to satisfy political expectations and detract from the social goals of supporting educational programs.
 - Plan educational activities in the regions as part of cultural and agricultural fairs and by placing food, nutrition and health topics (related to regional products) on the agenda of community meetings and festivals.
 - Conduct local workshops on the development of simple design, low-cost print materials (e.g., educational games, cards, dominoes, puzzles, games of chance, etc., using drawings and photographs).
7. Stimulate demand for health services through nutrition and health education, keeping in mind facilities' technical capacity, available infrastructure, personnel, supplies, transportation considerations, etc., in order to inspire confidence and user satisfaction and avoid disappointing the population.
8. Provide technical information through bulletins and executive reports for legislators, politicians and government officials on the nutritional and health situation, school performance and quality of life, to support and encourage policies, programs and projects in health, nutrition and food security. The latter would range from advocacy to protect the right of mothers to breastfeed their children to the formulation of national and regional policies for agricultural and food industry development, as well as projects to improve diversified food production by small subsistence farmers and to develop microenterprises to increase household income.

F. Population policies in health

In some countries, population growth at a rate greater than the availability of resources to meet basic needs in food and health care is a major risk factor for food insecurity and malnutrition. In addition, numerous pregnancies, with a short interval between them, whose frequency is significantly greater in poor families, represent risks to the health of mothers and children and have been identified as one of the risk factors in child malnutrition. It has been found that among families with the same income level, children in large families are exposed to greater risks of deficiency in energy and other nutrients. This is especially significant in the poorest families, but is also found in the second and third income quintile. In Guatemala, children born less than 18 months after the previous birth have a 2.5 times

greater probability of dying than those born after a longer interval. As a result, population policies, especially in family planning and other areas intended to change reproductive behavior to lessen the frequency of pregnancies and increase their interval, have unquestionable nutritional repercussions and may contribute significantly to preventing child malnutrition.

The repercussions of population policies on nutrition are especially important in countries with deficiencies in food availability in which demographic growth continues to be rapid and urbanization is increasing. Although the overall balance between population and food availability is not the only factor determining nutritional well-being, it has a clear influence: the greater the national or regional population, the greater will be the amount of food, goods, and services needed. This is a serious problem in many developing countries, especially in those where it is forecast that the population will double in the next 20 to 25 years and where there is not enough land. As with environmental problems, it is essential to deal with population problems if sustainable improvements in nutrition are to be achieved. An effective policy for dealing with the population problem should pursue greater equity in economic development as well as facilitate greater access to health care, education, and family planning services.

Most policies related to fertility try to reduce its level by lowering the number of children per woman and extending the interval between births; both phenomena have a positive effect on the nutritional status of mothers and children. Family planning services can help mothers reduce health risks stemming from unwanted or inappropriately spaced pregnancies. In low-income populations and rural areas, it is advisable for reasons of equity that governments organize and subsidize the provision of such services through public, non-governmental, and private institutions. Subsidized services are often the most effective way of informing the poor about reproductive health and improving the well-being of families. For both reasons, such services should form part of the minimal set of clinical services essential at the primary care level. In addition, governments should facilitate access to such services by those who can pay for them and are willing to do so. To improve services and increase the availability of contraceptive methods, price controls and prohibitions on advertising must be eliminated, restrictions on importation must be streamlined, and medical prescription requirements must be abolished.

A common problem is how to deliver services to the rural population, which usually has no access to the field staff responsible for family planning. In Guatemala, for example, 86% of peasant women live in communities without personnel specializing in family planning. In Colombia, Mexico, Bolivia, and other countries, community strategies have been successfully used to reach low-income women. Community health workers disseminate information about family planning and provide contraceptives to the most isolated populations, especially barrier methods (condoms, foam suppositories). Such community services are a very cost-effective means of improving maternal and child health. The cost of providing services to women who have no access to them is estimated at US \$15 to \$20 per year, and in countries with high mortality, the cost is less than \$10 per year of life saved.



Nutrition, maternal and child health, and family planning programs will be more effective if they are integrated and linked with each other. The effectiveness of exclusive breastfeeding as a contraceptive method is high during the first six months but diminishes with time and should be considered a supplement to other family planning methods. Such methods should keep in mind local breastfeeding and belief patterns so that contraceptive use does not interfere with breastfeeding. Nevertheless, breastfeeding and family planning programs often go uncoordinated.

G. Development of human resources

Health professionals play a critical role in generating political commitment and formulating, implementing and/or supporting nutrition in health policies that, to a large extent, are implemented through the health system. The public health system, as the largest employer of health care personnel, should include specific nutrition skills within the job profile of health care personnel at professional and other levels. Insufficient information and motivation, and deficient pre-service training of health professionals in nutrition in general, and particularly in breastfeeding, lactation management, infant feeding and micronutrient deficiencies, have been identified as significant constraints for program effectiveness. Efforts are being made to solve this problem through remedial in-service training which is relatively expensive and non-sustainable in the long-term. The need for remedial training will continue until concrete action is taken to strengthen pre-service nutrition training of health professionals in medicine, nursing, nutrition and public health, with emphasis on breastfeeding, infant feeding, and micronutrients.

Nutrition in health policies should make provisions for both pre-service and in-service training of health personnel in nutrition, infant feeding, breastfeeding, micronutrient deficiencies and other nutrition problems and programs, as occurs with other priority health problems (e.g., diarrheal disease control, immunizations, etc). Special consideration needs to be given to strengthening the undergraduate curriculum of professional and technical health personnel, in collaboration with the professional societies and school associations, to enable them to play an active role in promoting nutrition through health services (e.g., breastfeeding promotion, protection and support of breastfeeding, counseling on appropriate infant feeding and weaning practices, dietary management of infections, prevention and control of micronutrient deficiencies, etc.). At the same time, the health sector should promote, as some countries have done, the incorporation of health and nutrition contents in primary and secondary school curricula (see the module, *Food and Nutrition Policies in Education*).

The Wellstart Lactation Management Curriculum for Health Professionals, currently being adapted in Latin America, is an important tool for training in lactation management and breastfeeding promotion and protection. LAC HNS, through a contract with INCAP, has developed a micronutrient curriculum and set of materials for medical, nursing and nutrition professional schools. Similar efforts need to be made to strengthen training of non-

professional health care personnel. Well-defined health policies regarding the development of human resources, their roles and specific profiles, will stimulate and facilitate curricular changes in training institutions.

V. STRATEGIES FOR PROMOTING INTERSECTORAL COORDINATION

The principal public sector institutions directly related to nutrition are the Ministries of Health, Agriculture, Education, and Planning. Some countries also have a Nutrition Institute responsible for research and training human resources and, less commonly, a National Nutrition Council responsible for advising the Ministries on how to integrate nutrition objectives in various plans, policies, and projects.

In theory, the best way to bring about satisfactory intersectoral coordination is through a Committee, Commission, or National Council on Food and Nutrition. The experience of several countries has not been very successful in this regard, however. A primary problem stems from interest in including most sectors (productive and social) by creating a kind of parallel cabinet council, which makes it difficult to respond to nutritional priorities. There are also problems because of the seniority of its members. In some cases the members are the ministers or vice ministers themselves, with all the operating problems that causes; in other cases, they are middle-level professionals with little decision-making authority. Often there are no good information feedback mechanisms in each sector, and the result is that a representative ends up acting more on his own than his institution's behalf.

Based on accumulated experience, it seems more feasible to establish effective coordination between health, education, and agriculture than to embark on ambitious multisectoral programs. Ministries generally have specific food and nutrition departments or units, and coordination among their program heads is relatively simple. Some countries have also created joint health and education commissions which are a good example of coordination between the two sectors. It is often desirable to expand the resources of such departments to strengthen their role in policy formulation and intersectoral coordination. Nevertheless, Departments of Nutrition are often not part of mainstream activities related to the planning, execution, and control of policies and programs; this situation must be corrected.

Implementing sectoral nutrition policies is much more effective if there is good intersectoral collaboration. Improving communication about nutrition among Ministries is the key to strengthening coordination and cooperation. Intersectoral coordination can be difficult nationally, but it is gradually becoming more feasible at provincial and local levels. Some countries have begun decentralizing governmental activities, which opens up new opportunities for cooperation between sectors. Health, community development, and agricultural extension agents could combine their efforts with those of school teachers, for example, to deal with specific priority problems in communities. It is useful to analyze the nutritional repercussions of local development activities as a means to ensure that nutrition is included in basic development programs.

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**GUIDELINES FOR SECTORAL FOOD AND NUTRITION POLICIES IN
THE COUNTRIES OF LATIN AMERICA AND THE CARIBBEAN**

FOOD AND NUTRITION POLICIES IN AGRICULTURE

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Maarten D.C. Immink, Ph.D.

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University Research Corporation/International Science & Technology Institute
7200 Wisconsin Avenue, Suite 600
Bethesda, MD 20814*

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I. INTRODUCTION

The purpose of this module is to provide an overview of the relationships between agricultural policies, food security, and nutrition, emphasizing the reciprocal linkages between agriculture and nutrition. It describes the type of information needed for developing and monitoring nutrition policies in the agricultural sector, discusses the rationale for incorporating nutritional and food security objectives in agricultural policies, and proposes a series of strategies for promoting broad-based participation within the context of the decentralization processes underway in most countries of Latin America and the Caribbean, as well as suggesting approaches to promoting intersectoral coordination of sectoral nutrition policies. The module was prepared by Dr. Maaren D. C. Immink, consultant of the Latin America and Caribbean Health and Nutrition Sustainability (LAC HNS) contract. It was then reviewed by the participants in two subregional workshops on Food and Nutrition Policies and National Action Plans held in San Jose (Costa Rica) and Santa Cruz (Bolivia) in July 1995, attended by senior officials from the Ministries of Health, Agriculture and Education of 20 countries in the region. The present version of this module incorporates the suggestions and recommendations which came out of the two workshops.

Food insecurity and malnutrition are multifaceted problems in terms of their manifestations and underlying causes. The latter can roughly be divided into food-based and non-food based. Our concern here will primarily be with the former. Non-food based causes include health-nutrition interactions and behavioral aspects related to the utilization of food and non-food resources for nutrition. Malnutrition manifests itself in the form of poor physical development in children as a result of insufficient access to high-quality food (including breast milk), poor health status and/or inadequate child nurturing and care. Malnutrition is also seen in children and adults in the form of poor micronutrient status, such as iron-deficiency anemia in women or vitamin A-deficiency in children, as a result of inadequate intake of high-quality and diversified daily diets, and/or poor health status. The rising incidence of chronic diseases (hypertension, obesity, diabetes, and heart disease), often associated with increasing urbanization, is also diet-related. These major malnutrition problems often co-exist side-by-side in Latin America and the Caribbean (LAC), particularly among the urban poor.

As a result broad food, health and nutrition policy prescriptions at national level are not likely to be effective; rather a myriad of policy solutions that target different population groups are needed, while maintaining consistency among different sector policy solutions. Nutrition is often seen as the public policy responsibility of the health sector, even in LAC countries where food insecurity affects substantial numbers of rural and urban households. This clearly negates the importance of food in nutrition, and the potential significance of agricultural strategies and policies in contributing to improved nutritional status of the population. At the same time, the linkages between agricultural strategies and policies, and nutritional outcomes in specific population groups and specific settings, must be carefully analyzed to identify policy elements that either are inconsistent with positive nutritional outcomes, or that are consistent with such outcomes and therefore should be strengthened.

The agricultural sector is clearly not the only actor in solving malnutrition problems, and effective intersectoral policy coordination is crucial. Strong partnerships between the agricultural sector, and the private sector and the civil society are important. The local diversity in underlying causes of malnutrition need effectively be taken into account in policy formulation and implementation, requiring local level assessment, analysis, planning, action implementation and monitoring. And while integrated rural development strategies in the past have often been signaled as failures, few attempts have been made to understand the reasons for failure.

The increasing emphasis in LAC countries on people-centered development implies broad-based participation at grassroots level in policy formulation and implementation. Institutional reforms and mechanisms are needed to facilitate such broad-based participation in the public policy arenas, including in the agricultural sector. For example, the 1994 Law of Popular Participation in Bolivia provides a political, legal and administrative framework within which to operationalize the effective grassroots participation in decentralized policy formulation and implementation.

The purpose of this document is to offer operational and methodological guidelines to the different actors involved in the processes of developing and implementing agricultural policies, in order to:

- facilitate the incorporation of nutritional objectives and goals in agricultural sector strategies and policies, and in specific sector programs and projects;
- contribute to intersectoral policy coordination leading to the attainment of national nutrition goals; and
- promote effective, broad-based participation in setting national nutrition priorities and in agricultural policy formulation and in the implementation of agricultural policy actions.

The specific goals of this module are to:

- provide a basic understanding of the agriculture-nutrition linkages as a basis for identifying policy entry points to alter nutrition outcomes at household level through agricultural development policies, programs and projects, in coordination with other sector policies;
- set forth criteria that allow consideration of agricultural policy alternatives, and their possible effects on national and household food security and nutrition in different settings;

- present simple methodologies for assessment and monitoring of the nutrition situation and of the food and nutrition impacts of agricultural development actions; and
- provide insights into possible strategies and methodologies to:
 - transform food and nutrition information into effective agricultural policies and programs that have clear nutritional objectives and goals,
 - promote intersectoral policy coordination, and
 - create the basis for broad-based participation at different levels in agricultural policy formulation and action implementation.

The material in this module is organized to focus on major nutrition-related problems, in line with national goals and specific food-based nutrition strategy proposals, particularly in USAID-assisted countries in Latin America and the Caribbean.

II. RELATIONSHIP BETWEEN AGRICULTURE POLICIES, FOOD SECURITY AND NUTRITION

A. Agriculture and nutrition: identifying the linkages

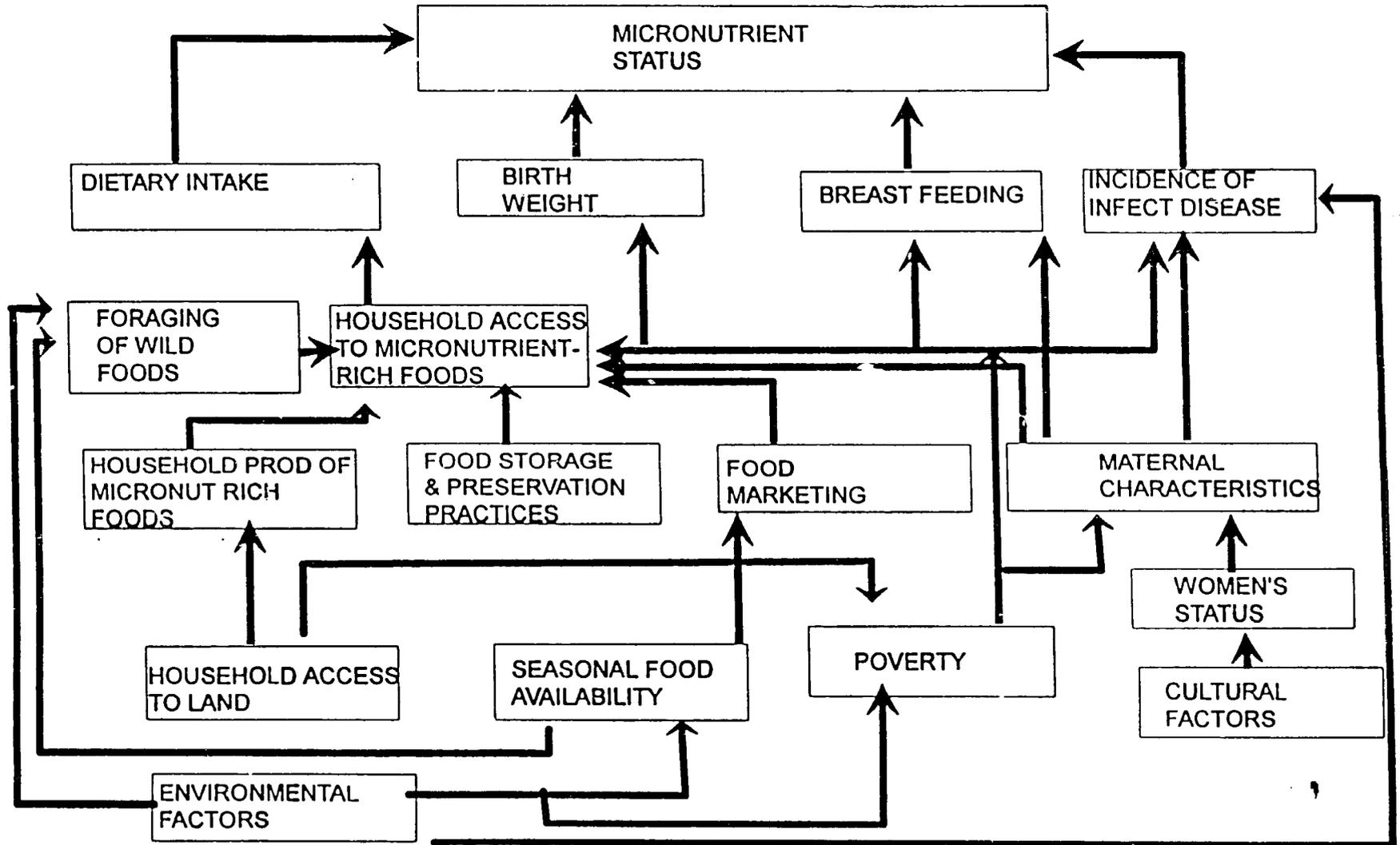
1. Food and nutrition outcomes of agricultural policies: what agriculture can do for nutrition

Food security and nutrition outcomes among rural households depend heavily on the agricultural strategies, policies and programs that are adopted and implemented. Policy and program alternatives usually attempt to maximize farm incomes by altering structural and technological constraints and by providing adequate price and other economic incentives. It is then assumed that the increases in household income will reduce food insecurity and malnutrition among the rural poor. An increasing body of empirical evidence now suggests that the income-food security-nutrition linkages at the household level are far more complex, and that the choice of agricultural strategies and policies in specific settings is just as important as the extent to which household incomes are increased.

Malnutrition (both under- and over-nutrition) manifests itself at the individual level, but the underlying food-related causes are found at the household, community, national and international level. There are a number of principal pathways through which agricultural sector policies and programs affect the nutritional status of individuals. These have been discussed in some detail elsewhere (Norse, 1985; Pinstup-Andersen, 1985; Kennedy and Bouis, 1993; von Braun and Kennedy, 1994). We shall summarize here most of this material, with the aid of two simple flow diagrams (Figures 1 and 2), which relates broad agricultural policy areas to specific entry points at the rural household level.

FIGURE 1

Agricultural Policies - Nutrition Linkages



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The farm household has, at any point in time, a given resource base, consisting of land, labour, physical and human capital, and technology. Through on- and off-farm activities, the household generates income, in monetary form (including net farm income) and in the form of any retained farm production for household consumption. Transfer income in the form of international remittances is an important additional income source for low-income households in many LAC countries. The principal sources of household food availability are then retained subsistence production, and purchased foods. Minor sources include food gifts, and foods obtained through foraging. Non-food expenditures include investment expenditures (education, home and land acquisition), current consumption expenditures (fuel, transportation, rent, clothing, consumer durables, leisure expenses) and health and basic services expenditures.

The relationship between specific expenditures and household income (and net savings, if any) depends on intra-household decision-making processes, including intra-household income control, and on the composition of income. For example, it is thought that there is a positive relationship between the share of household income controlled by women and the share spent on food, all other things equal. Net income derived from commercial crops is usually controlled by men, while women are in charge of subsistence crops, including of the income from the marketed share of those crops. Remittance income is often allocated to investment expenditures, such as housing improvements and land acquisition. Thus, household expenditure patterns may significantly vary at specific household income levels.

Intra-household decision-making processes, including intra-household food distribution, help to determine individual food intake levels, and expenditures for preventive and curative medical care of individual household members. Intra-household decision-making processes also determine the time allocation among on- and off-farm activities by individual household members. This is particularly critical in the case of women, whose traditional child nurturing role has to compete with other time demands, affecting both their nutritional status, as well as that of children.

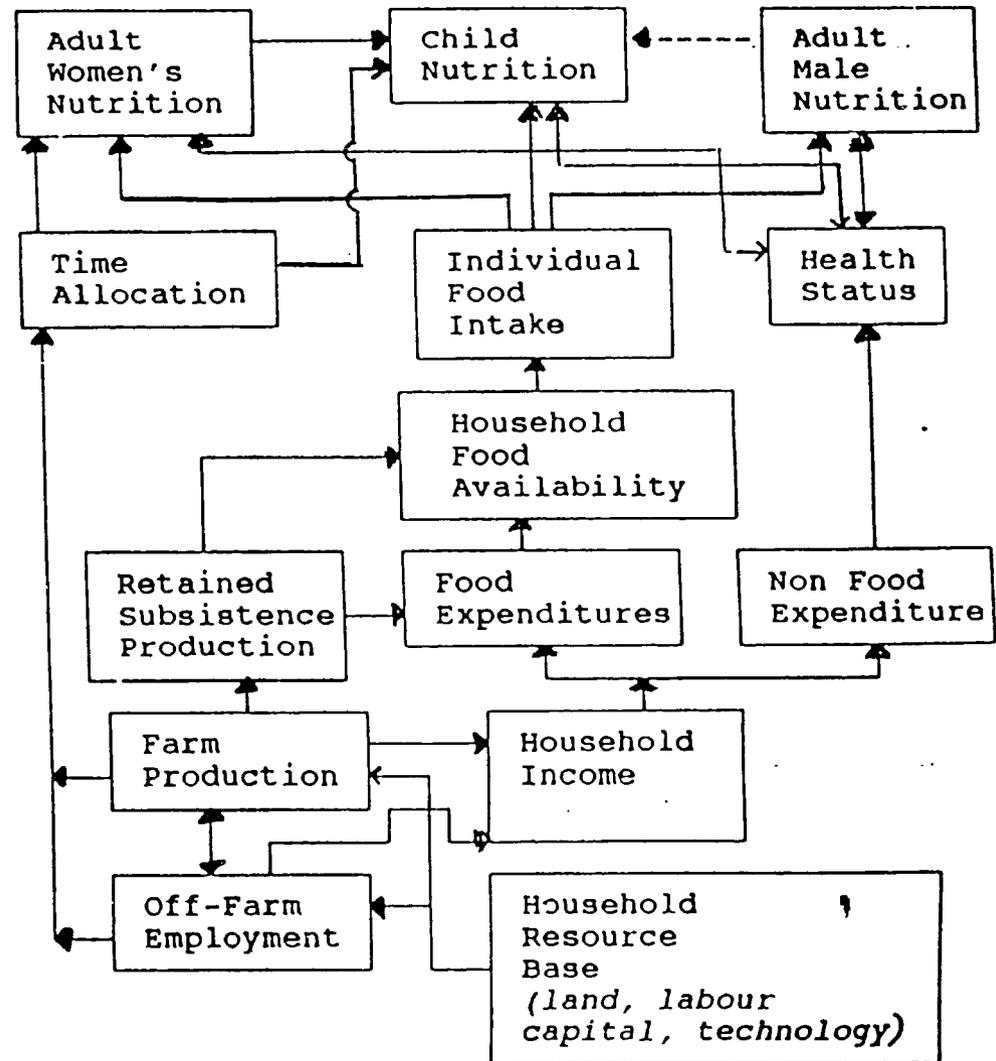
Not indicated in Figure 2 are the many feed-back linkages which can exist in these processes. For example, certain investment expenditures will add directly or indirectly to the household's resource base (land, access to technology, human capital) over time. Improvements in nutritional status in rural populations, as we shall argue below, can also be viewed as a form of investment in human capital. These feed-back linkages are weak in poor households, however.

A number of market and public policy variables interact with household-level variables to produce specific individual food, health and nutrition outcomes. Most relevant are food and non-food prices, rural and urban wages, agricultural and non-agricultural employment, credit, housing, health care and basic services. We have identified five agricultural sector policy areas which most immediately impact on rural households. We should, however, not overlook the aggregate effects that agricultural sector policies have, through existing rural-urban market linkages, on the food and nutrition conditions of the urban poor. Levels

FIGURE 2

Conceptual Framework to Identify Agricultural Policy Entry Points for Micronutrient Status

<u>POLICY AREA</u>	<u>FARM-LEVEL ENTRY POINT</u>
A. Structural Reforms (Land)...	HSHLD Resource Base
B. Rural Infrastructure.....	Farm Production
C. Market Reforms Price Policies...	HSHLD Resource Base Farm Production Employment
D. Technological Development.....	HSHLD Resource Base
E. Institutional Marketing Development.....	Farm Production



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and patterns of domestic food production, together with net food imports, external food aid and the efficiency in domestic food marketing, are important determinants of urban food prices (in the absence of direct market price interventions). Technological developments in agriculture that lead to greater land concentration or that are capital-intensive can contribute to already high rates of rural-to-urban migration, further depressing urban wages and adding to the pool of urban poor.

Agricultural sector policies target the production-income linkages as primary entry points at household level, particularly the household's resource base, and farm production (crop mixes, yields). However, other effects of such policies that affect the income-nutrition linkages, specifically through their impact on health and the time allocation of different household members, must also be considered. Only then can we fully assess the potential of agricultural sector policies/programs to improve individual nutrition. Agricultural programs in Latin America that seem recently to have been implemented with specific food and nutrition objectives are: crop diversification and commercialization, agricultural credit and extension, hybrid seed varieties, and appropriate food crop production techniques (Kennedy and Payongayong, 1991). Other agricultural sector programs can, however, also be structured to have positive effects on food and nutrition outcomes.

a. Structural policies

Land reform policies involve land re-distribution, and the strengthening and enforcement of land tenure rights, and aim at augmenting the resource base of poor rural households, whose incomes are expected to increase as a result. The positive association between farm size, and per capita food consumption and daily energy and protein intake has been demonstrated for several countries, including in the LAC Region (FAO, 1982). This association was also found among highland subsistence farmers in Guatemala (Box 1). Secure property rights to land, and minimum access to land are usually conditions for farmers to obtain institutional credit, increasing their access to farm inputs and capacity and willingness to adopt new technologies. A shift in crop mix is likely to occur towards high-value crops, which may have higher labor and input requirements. The net effect on household income, time allocation, household food availability, and ultimately, the nutritional status of individual household members, may be uncertain.

b. Rural infrastructure

Large- and small-scale irrigation, rural access roads and rural storage facilities are all considered to be infra-structure, the development of which aims at improving farm-level production efficiency, raising rural incomes, and food availability. Much of the new agricultural technologies require irrigation for their adoption; at the same time it can be shown that man-made irrigation has substantially contributed to the expansion in cereals and livestock production in arid- and semi-arid regions (Kennedy and Bouis, 1993). However, there are environmental concerns associated with man-made irrigation, which may negatively affect the health status of rural populations, by creating conditions which facilitate disease

BOX 1

**GUATEMALA: FARM SIZE, HOUSEHOLD FOOD
AVAILABILITY AND ADEQUACY OF FOOD INTAKE**
Subsistence Farmers, 1987

	Means by Farm Size Quartile:			
	1	2	3	4
Per capita food expenditures (Quetzales/year)	262	269	265	310
Per capita consumption of farm-produced:				
Maize (lbs./yr.)	51.6	88.8	96.8	114.6
Beans (lbs./yr.)	4.4	9.1	15.0	12.3
Adequacy of dietary energy intake (%):				
Household	108	118	120	112
Preschoolers	73	80	74	80
Adequacy of protein intake (%):				
Household	134	145	152	149
Preschoolers	110	123	119	127

Total household food availability from own production was higher on larger farms among these subsistence farming households, while per capita food expenditures did not differ, except in households in the largest farm size class. While the general adequacy levels of dietary intake for households and preschoolers showed a weak association with farm size class. The association between the adequacy levels of protein intake and farm size class was more consistent, indicating that qualitatively daily diets tended to be better on larger farms.

This example assumes that individual daily energy requirements are independent of farm size extension. The analysis may over-estimate the dietary energy adequacy levels for larger farms. (Adequacy means percent of average daily requirements covered by estimated actual intake).

Source: Immink and Alarcón, 1991.

transmission through contamination of water sources and increasing vectors for parasitic infestations. Diseases such as malaria and cholera have an immediately negative effect on the growth and development of children.

Rural access to roads and storage facilities aim at increasing the efficiency of marketing of farm surpluses. Adequate access to rural infra-structure is essential to maintain high returns to the adoption of new technologies, even when it is not clear whether it initially drives technology adoption at farm level. Construction and maintenance of rural infra-structure often involves coordinated actions between the Ministry of Agriculture and the public works department. For small-scale infrastructure, a "partnership" between farmer or organized community groups, and a non-governmental organization and/or a line ministry may be created, sometimes through food-for-work programs.

c. Market reforms and price policies

Resource-poor farmers usually have poor access to formal agricultural credit, and to agricultural inputs. This means that they are unable to assume production risks, and adopt new technologies, thus perpetuating low farm incomes and low yields of subsistence crops. At the same time, adequate access to agricultural credit is not a problem on large "haciendas". Subsidized agricultural credit leads to adoption of capital-intensive technologies, displacing the rural employment on which the landless and resource-poor farmers often depend to supplement low farm incomes. Similar problems exist with subsidies of agricultural inputs, which are not likely to benefit the resource-poor farmers, with the usual allocation of subsidized inputs to high-value cash crops on large "haciendas". The landless may benefit through employment creation on those estates.

The rural poor, including small-scale subsistence farmers, in Latin America are usually net buyers of food. Lower domestic food prices, as a result of increased farm productivity, will result in positive food outcomes among the rural poor. The evidence seems to suggest that generally policies that attempt to increase domestic food production through higher farm prices are ineffective, and even when effective in raising food production, the nutritional effects on the poor tend to be neutral (Mebrahtu, Pelletier and Pinstrup-Andersen, 1995).

d. Technological development and dissemination

Agricultural research and development has traditionally focused on: (1) increasing yields, through the development of high-yielding varieties, (2) increasing the returns to household resources, through the development of multiple cropping systems, and (3) lowering production risks, through the introduction of drought- and pest-resistant varieties, promotion of integrated pest management systems, and development of generally more resilient farming systems (Norse, 1985). These technological developments aim at raising farm production and incomes. When successful and adopted on a large scale, they can raise domestic food supplies, lower domestic food prices, and augment food consumption by low-income groups. One example for rice in Colombia is reported by Scobie and Posada (1977). The capacity of

agricultural research institutions to effectively address nutrition concerns has been questioned (Tripp, 1990). On the other hand, Pinstrop-Andersen (1990) has argued that nutritionists have failed to make a strong case for nutrition to agricultural researchers, and that there are at least six nutrition-related factors through which agricultural research can potentially produce positive effects at the household-level: income, time allocation of household members, food prices, energy expenditure levels, incidence of infectious diseases, and food consumption.

The adoption of new technologies, particularly by smallholder farmers, is often hindered by the much higher input and labor requirements, and the lack of adequate rural infra-structure and of opportunities to learn new production techniques, thus introducing significant production risks. The larger farm surplus often further strains already inefficient domestic marketing systems. The net outcome of adoption of new production techniques on household income, food availability and nutrition is often uncertain, as demonstrated by von Eraun and Kennedy (1986;1994). Firmer integration between the different agricultural sector services in targeting farmer groups and adequate pricing policies should aim at facilitating adoption by smallholder farmers (Binswanger and von Braun, 1991).

One potential food-based strategy that is gaining increasing attention to address some key micro-nutrient deficiencies in the population, is the development of mineral-rich seeds of staple crops. Much of this work is still in the proposal stage, and is likely to require a significant time period for development and widespread adoption, but may eventually demonstrate to be comparatively cost-effective in relation to supplementation and food fortification programs. "Right to food" advocates may question the ethical implications of this approach, as they would argue that people have a right to adequate access to a sufficiently varied diet to provide them with all nutrients to sustain health.

Agricultural extension services disseminate new production technologies, but are often plagued by a number of institutional problems which hamper their effectiveness in promoting the adoption of new technologies (Norse, 1985). Blanket prescriptions, which ignore local diversity in technology-adoption constraints and farmer-held indigenous knowledge, are other obstacles, which argue for partnerships in technology development at field level between farmers and local level technicians (Chambers, Pacey and Thrupp, 1989). As one specific example from the Mantaro Valley in Peru demonstrates that farmer participation in defining problems, in designing solutions, and in implementing and evaluating those solutions are essential parts of the process of technology development at field level (Fernández and Salvatierra, 1989).

e. Market development

Promotion of shifts towards cash crops, particularly nontraditional export crops, has been a major agricultural development strategy in Latin America over the last two decades (Barham, et al., 1992). This is not the place to do an exhaustive review of the effects on household resource allocation, farm production, income, health and nutrition (see below). Much of

nontraditional crop production among smallholder farmers in Latin America takes place as contract farming, through cooperative production, or using informal marketing channels. What has been documented as having a significant effect on household incomes are the significant inter-temporal price variability, and the small share of the total value added captured by the producers. For example, melon and ajonjoli producers in Honduras reported that price variability and market insecurity were their two main marketing problems (Weller, 1992). Guatemalan cooperative snow pea producers, during a boom period, received on average 19 percent of the final consumer price paid in the U.S. (von Braun, Hotchkiss and Immink, 1989). Many examples have been cited for Central America and other products, in which the farmers' share in total value was significantly lower (Weller, 1992; Mendizábal and Weller, 1992), in part because of poor market integration of farmers.

A detailed summary of the recent experience with nontraditional export crops in Latin America, including an assessment of the food security and nutrition outcomes at household level, can be found in DeWalt (1993). That document provides a synopsis of the empirical evidence with regards to household linkages between a re-allocation of household resources as a result of a shift towards nontraditional export crops, and food and nutrition outcomes. It serves as an example of an analytical approach by which to trace the food and nutrition effects among vulnerable households of different agricultural development strategies and sector policies and programs.

2. Food, nutrition and agricultural growth: what nutrition can do for agricultural development

The question of how different agricultural policies and programs affect household food security and nutritional outcomes among different population groups is only part of the story. We can equally ask: how can better nutrition contribute to agricultural development in Latin America and the Caribbean, and indeed to sustained rural poverty alleviation? In an immediate sense, the question is relevant, because of the current policy emphasis on labor-absorbing technologies in land-constraint agricultural sectors. In the long-run, nutrition can be seen as a form of human capital investment, a leading source of economic growth and social development.

The empirical evidence on the nutrition-agricultural development linkages is rather scarce. World-wide estimates point to an economic loss of \$ 9 billion annually because of productivity losses attributed to poor adult nutrition (Pinstrup-Andersen, et al., 1991). Relevant evidence from a number of studies has conveniently been summarized by Latham (1993), while the methodological short-comings of those studies have been discussed by Strauss (1993). A few relevant studies have been undertaken in the LAC region, and those mainly in Colombia and Guatemala involving rural men. But we can develop at least the conceptual argument here, which in turn is likely to be important for policy advocacy work aimed at incorporating nutritional objectives and goals into agricultural policy.

a. Adult nutrition

Many on- and off-farm activities in rural areas are labor-intensive, and require high levels of human energy to perform. This refers equally to work activities, and to social activities, such as community development actions. Leisure activities are more easily adjusted in intensity. The physical fitness and capacity to perform strenuous work of rural adults are reduced under conditions of chronically low levels of human energy availability (from food intake and body energy stores). The results are shorter time allocations to energy-intensive activities, which will also be performed less strenuously. This may be especially critical during periods of high on-farm labor demand, such as harvests, and agricultural productivity suffers. Time allocation to other activities are reduced to compensate for the need to maintain a certain level of energy output at work. This was shown, for example, for two groups of agricultural workers which differed in the level of daily energy intake (Viteri, 1971). Although there is little empirical evidence, it is reasonable to postulate that higher levels of daily energy intake by rural adults will positively contribute to agricultural productivity and higher household incomes. For example, it has been shown that higher levels of adequacy of daily protein intakes had a positive effect on the earnings of men and women in Nicaragua (Behrman, Wolfe and Blau, 1985). Maize yields among Guatemalan smallholder farmers have been shown to be positively related to the quality of labor inputs as measured by the body mass index of male farmers (Immink and Alarcón, 1992).

Among the major micronutrient deficiencies in developing countries, iron-deficiency anemia is perhaps the most critical for agricultural productivity. Physical work capacity is usually negatively affected by iron-deficiency anemia, specifically by low levels of hemoglobin in the blood. The capacity to engage in physically strenuous activities for any length of time is then compromised, and work output declines. Increases in hemoglobin levels of agricultural workers in Guatemala was shown to improve their physical work capacity (Viteri and Torún, 1974). The few studies which directly related adult iron status to rural worker productivity were conducted in Africa and Asia, and showed a strong and positive association (Latham, 1993). Thus it may generally be expected that improvements in iron status among iron-deficient rural adults will increase worker productivity, and agricultural output.

b. Child nutrition

The linkages between childhood nutrition, and adult productivity and social development in general are not well established. To the extent that achieved adult stature acts as a "marker" of the nutritional history during childhood, there appears to be a positive relationship with agricultural productivity, at least in occupations, such as sugarcane cutting, as shown in Colombia and Guatemala (Spurr, Barac-Nieto and Maksud, 1977; Immink, Viteri and Helms, 1982). Taller sugarcane cutters in Guatemala were estimated to enjoy lifetime earnings which were 16 percent higher than those of their shorter colleagues. Better childhood nutrition was also shown to improve the productivity of construction workers in Chile, because of improved mental development (Selowsky and Taylor, 1973). Better nourished children learn better and are less absent from school, thus potentially raising the economic and social

returns from investment in schooling (Pollitt, 1990). However, the private economic returns in the form of higher incomes and occupational mobility, and greater potential for social development, are then confined to adults who effectively attended school during childhood.

Vitamin A deficiency in children can impair vision, and in extreme forms, leads to blindness. This, in turn, will impair adult productivity, and raise the dependency ratio in rural households. Prevention of vitamin A deficiency has thus positive private and social returns. Iodine deficiency in children negatively affects their physical growth and maturation, and at a young age their mental development, with subsequent negative consequences for adult productivity.

B. Food and nutrition problems and agricultural policies

In this section we focus on three significant, food-related problems in the LAC region: household and individual food insecurity, micronutrient deficiencies, and diet-related chronic diseases, and link these to specific agricultural policies. The role of agriculture as an economic activity varies widely among the USAID-assisted LAC countries. Agriculture's contribution to gross domestic product ranged in 1990-1992 from 5.2 percent in Jamaica to 32.2% in Nicaragua and Haiti. The agricultural sector absorbed in 1993 also a varied share of the total labor force, ranging from 21.2 percent in Guyana to 53.2% in Honduras, and 61.8% in Haiti. Total crop production in the LAC Region is made up of: sugarcane, cereals, fruits, roots, tubers and pulses, vegetables, coffee, and others. Cereals account for 40 percent, and fruits and vegetables for 35% of tonnage of annual crop production (after subtracting tonnage of sugarcane).

In half of the fourteen USAID-assisted LAC countries, per capita food availability fell during the 1980's, and in two more it remained unchanged (FAO, 1994). In seven out of the nine countries with a lower or unchanged per capita food availability, the share of food imports in the total food supply increased. The generally declining per capita food production is attributed to: inequitable land distribution and tenure systems, environmental degradation, lack of adequate access to credit for farmers, and general policies which provide disincentives for agricultural growth (USAID, 1994).

1. Household and individual food insecurity

a. Problem statement

This is not the place to review all the definitions of food security (Maxwell and Smith, 1992). Households are food-insecure when as an unit they donot have at all times access to sufficient food that allows its members to lead a healthy and productive life. Households may be chronically food-insecure, due to poverty, or may be temporarily food-insecure because of seasonal fluctuations in food availability, or suddenly occuring events such as: loss of employment, droughts, armed conflicts, rapidly rising food prices, serious illness. Seasonal or other temporary risks (or "shocks") to household food supplies of chronically

food-insecure households have of course greater consequences than for food-secure households. Also, different members of the same household may not necessarily be at the same risk of food insecurity, because of intra-household decisionmaking and resource allocation. Thus, some members of food-secure households may still be individually food-insecure.

Households may employ a number of strategies to cope with less access to food; these strategies will vary over time with: the perceived duration of the food shortage (conditioned by prior experiences), household resource base, household production patterns, conditions in the labor and land markets, cultural perceptions of food shortages, and the demographic composition of the household. These strategies normally range from short-term changes in household production, food intakes and physiological adaptations, to sale of labor services, to asset sales to permanent outmigration.

What constitutes "sufficient food" is a relative measure: aggregate household food needs, usually expressed as dietary energy needs, vary with household size and composition, and with the level of activity of each of its members, as well as with their biological needs for body maintenance, and for growth and development in children. Health status also plays a role in defining the biological needs for food.

Approximately 23 percent of the population in Central America, and 26 percent of the population in South America, suffer from poverty-based food insecurity. There are of course significant inter- and intra-country differences in the incidence of poverty: (a) the largest share (and numbers) of the poor in Central America and the Caribbean are located in warm tropics, followed by temperate zones, and (b) the largest share of the poor in South America live in dry zones, but the largest numbers in humid and wet zones (Broca and Oram, 1991). Urban-rural differences in the incidence of poverty and chronic food insecurity are often significant. For example, it was reported in 1989 that 85 percent of rural households, and 61 percent of urban households in Guatemala were classified as poor; similar figures for Perú in 1986 were 64 and 45 percent, respectively (ILO, 1993). In the Dominican Republic, with a similar urban-rural gap in the incidence of poverty (11 versus 30% in 1992), however, the urban-rural difference in average caloric adequacy was interestingly found to be in the opposite direction (92 versus 104%). With the high rates of urbanization, and three-quarters of the LAC population estimated to live in urban areas by the year 2000, urban food insecurity is likely to become a major policy concern.

b. Food-based strategies and agricultural policy actions

In the previous discussion of the agriculture-nutrition linkages, a number of relevant areas of agricultural policy actions for household food security were identified (see section B.1.). A household vulnerability assessment matrix (Table 1), while developed to assess households' vulnerability to food insecurity and its consequences, also clearly indicates where agricultural policy actions can potentially intervene to reduce production and market risks to household food insecurity, as well as contribute to the household's ability to cope with these and other

TABLE 1

Guidelines for Sectoral Nutrition Policies: Agriculture

Household Vulnerability Assessment Matrix				
Risk of an Event	Ability to Cope			
Shocks/Trends	HH Characteristics	Access to Resources	Production/Income Opportunities	Support Structures
Baseline Vulnerability <i>Crop Production and Livestock Risks</i> drought episodes soil conditions pest infestations <i>Market Risks</i> market infrastructure price fluctuations (assets, food, cash crops, livestock) food shortages access to employment <i>Political Risks</i> conflict/war	composition (age dependency ratio) education health status out migration	access to land access to labor liquid assets productive assets credit common property resources (for wild foods and other products) food stores	crop/livestock production other income sources seasonal migration	community support mechanisms (claims) NGOs government policies access to social services
Current Vulnerability <i>Crop Production and Livestock Risks</i> current drought pest attack <i>Market Risks</i> market infrastructure price fluctuations (assets, food, cash crops, livestock) food shortages access to employment <i>Political Risks</i> conflict/war	composition (age dependency ratio) education health status outmigration	access to land access to labor liquid assets productive assets credit common property resources (wild foods and other products) food stores	crop/livestock production other income sources seasonal migration	community support mechanisms (claims) NGOs government policies access to social services
Future Vulnerability (trends) <i>Environmental Degradation</i> <i>Land Pressure</i> <i>Out Migration</i>	demographic changes	land tenure changes	employment trends	support structure changes

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risks. This links up with the earlier discussions of the agricultural sector policy areas, and household-level linkages with food and nutrition outcomes.

It may be useful to raise some key questions and considerations for agricultural policy decisions and actions as these relate to household and individual food security. We shall rely for this again on the ideas found in Maxwell and Smith (1992).

■ **Efficiency/cost-effectiveness**

Household and individual food security involve household production and intra-household distribution. How does a specific policy action affect food security, and at what cost is the increase in food security achieved, assuming there is an increase? How does the cost of obtaining greater food security compare with the expected benefits from greater food security? The answer may vary depending on to whom the question is posed (Box 2).

BOX 2

COST OF HOUSEHOLD FOOD SECURITY AMONG SMALLHOLDER FARMERS IN GUATEMALA PRODUCING NON-TRADITIONAL EXPORT VEGETABLES

The export vegetable-producing farmers maintained on average half of their land in subsistence crops (maize and beans). Average gross margins for the export crops were multiples of those for maize and beans. With the substantially higher returns to land and labor in export vegetable production, farmers paid a high risk premium to maintain food production for own consumption, given that the imputed economic costs of producing subsistence crops was substantially higher than the market price of maize and beans. Thus, food security was maintained inefficiently from the economist's point of view. However, from the farmer's point of view, this food security was likely obtained efficiently, based on the high production and marketing risks of export vegetables. In other words, the food security risk premium the farmers incurred was less than their expected food security benefits, given the high probability of food insecurity occurring without subsistence crop production. Access to maize provided the farmers with culturally based benefits as well.

Source: von Braun, Hotkiss and Immink (1989).

- **Sustainability**

How does the policy action affect the household or individual's ability to withstand, and recover from, future food security risks? What policy actions must be designed to augment that capacity?

- **Equity**

How does the policy action affect the food security of all households in the group? Are the food security benefits equally distributed among all households? How does the policy action affect the distribution of food security benefits among all members of the household? Are complementary policy actions required to improve the equitable distribution of food security benefits?

- **Household coping mechanisms and livelihood strategies**

Does the policy action address the question of how people are able to feed themselves, rather than how they fail to do so? Is the policy action designed to protect the people's livelihood and their asset base, and strengthen their coping capacity to maintain food security?

- **People's perceptions and time horizons**

Does the policy action take into account people's perceptions of their food security, the priority they accord food in relation to other basic needs, and their cultural attitudes towards food? Is the policy action designed to integrate these elements with the technical solutions? Does the policy action take adequately into account people's time preferences, in terms of a short-term increase in food consumption versus sustained food security?

These policy criteria involve trade-offs or inter-dependence. For example, policy actions that are highly efficient in producing food security, are also likely to produce more sustainable food security conditions. Equity and efficiency often need to be traded-off.

- c. *Urban food security and agricultural policies*

It was estimated in 1994 that almost 68 percent of the population in Central America, and 77 percent of the South American population, lived in urban areas. These percentages are estimated to change by the year 2025 to 80 and 88 percent, respectively. Adequate urban food supplies will continue to be a major policy concern in Latin America, especially in light of the recent trend of declining per capita domestic food production. The link between domestic food production and urban food security are urban food prices. With the absence of general or targeted food prices subsidies under structural adjustment, market supplies of food is a main determinant, together with the efficiency of domestic food marketing, of the food prices that urban consumers face.

There is, of course, a clear interface between agricultural policies and food import (including food aid) policies, in determining urban market supplies of food and urban food prices. A review of past trends in USAID-assisted LAC countries showed that annual food imports (including food aid) often bears little relationship to annual domestic food production, introducing year-to-year variability in domestic food prices along a long-term upward trend (Delgado, 1995). This has motivated a number of LAC countries to establish so-called price band policies to stabilize domestic cereal prices by varying import duties depending on whether the import prices exceed a set price ceiling or fall below a price floor. These policies are now also coordinated on a regional basis (e.g., Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica). Their impact, however, has not yet been assessed.

A number of urban-based strategies are currently employed in LAC that aim to contribute to less food insecurity among low-income households, and at the same time increase dietary diversity, which in turn may reduce the prevalence of micronutrient deficiencies and the incidence of diet-related chronic diseases.

■ Urban agriculture

Agricultural production in urban and peri-urban areas has been advocated as a means of increasing household food supplies, as well as of introducing a greater diversity in the daily diet of the urban poor (Smit and Nasr, 1992). Little empirical evidence exists, particularly for the LAC region. A study of the nutritional returns of home gardens in "pueblos jóvenes" of Lima found: greater availability of higher-quality carbohydrate sources, reduced nutrient losses due to freshness of the produce, and more frequent household consumption of vegetables and fruits (Niñez, 1985).

Obstacles to urban agriculture often seem to be present, in the form of urban land use and water management regulations and indifferent-to-hostile attitudes towards urban agriculture on the part of local officials. NGOs in the LAC Region have particularly been active in promoting urban agriculture among low-income households. In several LAC countries, either local government or the national government has assumed technical and administrative responsibility for urban agriculture, such is the case in Mexico City, Buenos Aires, Perú, and Panamá (Smit, Ratta and Nasr, 1995). These models are worth examining in greater detail, to draw out generalizable lessons and ascertain when urban agriculture is an economically viable and sustainable food-based strategy to lower food insecurity and micro-nutrient deficiencies among the urban poor.

A number of policy questions will require answers. Should a ministry of agriculture promote urban agriculture by supplying seeds, small animal stocks, tools and technical extension services, in partnerships with NGOs, local governments and community organizations? Who would benefit among the urban poor? What changes in local regulations (land use, water management) and in official attitudes towards urban agriculture are required? What are the household-level constraints to urban food production, how do these differ from constraints in rural areas, and what are the net effects on nutritional intake, through direct consumption

and/or higher incomes? Do positive environmental effects of urban agriculture result in lower incidence of infectious diseases, and ultimately to better nutritional status?

■ Urban food marketing

To lower food costs for low income households, and increase the access to a greater variety of foods, a number of urban food marketing strategies are employed, to wit: (1) street vending of foods, (2) farmers' markets ("ferias del agricultor"), and (3) community kitchens. These represent either individual coping efforts by the urban poor, as in the case of street vending, or grass-roots self-help efforts, with or without participation by institutions. Street vending of prepared foods increases more convenient access for urban consumers to popular foods at lower costs, generates income for low-income households, but is subject to low food safety. Farmers' markets are often promoted by the ministry of agriculture in an attempt to raise farmer prices and lower consumer prices by cutting out middlemen. However, only farmers close to urban centers with adequate means of transportation, as well as middle income consumers, are likely to benefit.

Community kitchens got started as grass-roots movements by urban women in the late 1970s in low-income areas of Lima, in response to high levels of inflation and rising under- and unemployment, and as a means of lowering the costs of daily diets and making available more time for income-generating activities by women (UNICEF, 1994). Empirical evidence is scarce, but there are indications of some significant dietary impacts, without substantial cost-savings for meals to participating households. These kitchens, however, often maintain a dependency on donated or subsidized foods, as was also the case in México with the Program of Community Kitchens and Integrated Services Units ("COPUSI's"), initially established in the late 1980s by the National System for Integral Family Development (DIF). What makes this program interesting is the inter-institutional cooperation that is channeled through these units, often with community participation, and which has led to local-level adaptations of the community kitchen model. However, the Ministry of Agriculture does not participate in this program. In Perú, on the other hand, the Ministry of Agriculture participates in an inter-ministerial commission (together with the ministries of Health, Education and Housing, and the President's Office) that administers one type of community kitchen program ("comedores del pueblo") in low-income areas of Lima (UNICEF, 1994).

■ Agro-industries

Agro-industries are increasingly being established in LAC countries to integrate vertically agricultural production with processing and marketing, and thus capture more of the total value added, and create local employment. Free-trade zones, such as in Guatemala, provide an economic impetus for investment in agroindustries to locate close to urban centers because of access to infra-structure and transportation facilities, while drawing on labor in peri-urban areas. As the population shifts over time more and more to urban centers, relative wage relationships may also shift towards comparative advantages in urban areas, thus creating greater incentives to establish agroindustries there, generating urban employment.

Agricultural policy actions that, in addition to focusing on lowering urban food prices through greater domestic productivity, could be considered to lower the vulnerability among the urban poor to household food insecurity may include:

- promotion of urban food production, either as home, school and/or community gardens, through small credit programs and appropriate extension (and training extension workers in urban agriculture methods);
- entering into partnership with local institutions, and facilitate changes in local regulations regarding land use and water management;
- strengthen direct market links between rural small-scale producers and urban low-income consumers, promoting producers organizations, providing credit for transportation facilities, and constructing market facilities in low-income areas of the city;
- promotion of street vendor organizations, and strengthen their direct links with producer organizations for food supplies, while working with local institutions or NGOs to improve food safety among street vendors through training, small credit programs and adequate sanitary infrastructure.

2. Micronutrient deficiencies: vitamin A, iron and iodine

As was described in the Introduction to these guidelines, micronutrient deficiencies--especially those of iron, vitamin A and iodine--continue to be important obstacles to development in the LAC region. Alternative approaches to micronutrient deficiencies include supplementation and food-based strategies which seek to increase consumption of natural sources of these micronutrients. Clearly, strong linkages need to be established between food- and non-food-based strategies, to achieve national micronutrient goals.

Some evidence suggests that iron and vitamin A intakes increase with higher dietary energy intake levels, however, this is not universally true: the greater the share of purchased foods in the total household food supply, the weaker the positive association between the adequacy of iron and vitamin A intakes, and the adequacy of dietary energy intake. This is particularly important in urban households, which are highly market-dependent for their food supplies. More important than the levels of food intake, is the food composition of the daily diet. Normally, a greater food diversity is associated with less risk of deficient iron and vitamin A intakes.

a. Food-based strategies and agricultural policy actions

The flow diagram in Figure 2 is meant to facilitate the identification of household level entry points for policy actions. We treat iron and vitamin A together, which seems justified in view of the fact that on the food side, the underlying causes are essentially the same, and

thus the same policy actions are required to address both problems. Food-based strategies, which involve the agricultural sector, aim to address the underlying causes of inadequate household access to, and individual consumption of, vitamin A and iron-rich foods, and of foods that enhance the absorption of these micro-nutrients. The needs for intersectoral policy coordination are also clear in Figure 2:

- health sector: to lower the incidence of infectious diseases, promote breastfeeding, prevent low birth weights;
- private commercial sector: to improve domestic marketing of micro- nutrient-rich foods, to promote breastfeeding;
- education sector: to promote production of micronutrient-rich foods in school gardens, to develop educational materials;
- NGOs and popular organizations: to improve the status of women, to develop and disseminate educational and training materials, to promote household production of micronutrient-rich foods;
- trade and industry: food fortification with micronutrients.

There are at least five areas for food-based policy actions that directly involve the agricultural sector:

- **Technological development**
 - Food preservation techniques to conserve the micronutrient content of foods, to reduce food contamination.
 - Plant breeding to increase plant absorption of micronutrients from the soil.
- **Information generation**
 - Inventory traditional food plants that have high micronutrient contents, and those that enhance vitamin A and iron absorption.
 - Develop and implement simple, food-based methodologies to assess the vulnerability to micronutrient deficiencies of specific population groups, and to monitor changes over time in that vulnerability.
- **Modification of dietary practices**
 - Create a general awareness in the rural population about the importance of micronutrients, using social marketing techniques.

- Provide training through the extension services in food preparation techniques, household storage and preservation, incorporation in the diet of indigenous food plants.
- **Improvement in household access to micronutrient-rich foods**
 - Promotion of home, school and community gardens, through credit and extension services, in rural and urban areas.
 - Promotion of small animal husbandry, fish ponds.
 - Promotion of diversified cropping patterns among smallholder farmers, through credit and extension services, small-scale irrigation and soil conservation.
 - Promotion of rural and urban consumer cooperatives and community stores, to market locally produced micronutrient-rich foods.
- **Creating an enabling policy and institutional environment**
 - Create an awareness at all levels within the Ministry of Agriculture of the institutional commitment to the national nutrition goals, in general and with respect to micronutrient deficiencies.
 - Provide adequate training to local level staff to increase the effectiveness of their participation in the above activities involving the extension services.
 - Create opportunities for Ministry of Agriculture staff to learn from people-held knowledge about indigenous food plants and farming practices.
 - Re-assess institutional targeting criteria for credit and extension services, and re-orient these to reach highly vulnerable groups (women, urban poor, rural landless, smallholder farm households).

3. Diet-related chronic diseases

a. Problem statement

Diet-related chronic diseases (diabetes, hypertension, stroke, heart disease and some cancers) are becoming an increasing concern in the LAC region, and are often associated with urban life styles, and changing food consumption patterns associated with rising incomes. Food intake patterns represent one of six reversible risk factors of chronic diseases; other risk factors are obesity, lack of physical exercise, and high levels of alcohol consumption, cigarette smoking and emotional stress. Daily diets that contain a large share of plant foods (fruits, vegetables, legumes, roots and tubers, and whole-grain cereals) and seafood are associated with low incidences of diet-related chronic diseases, whereas diets that contain a

large share of milk, milk products, meats, and fats and oils are associated with higher incidence of chronic diseases. The latter food groups are normally characterized by high income-elasticities among low-income groups, fruits, vegetables and seafoods by intermediate income-elasticities, while cereals by low or sometimes negative elasticities.

Obesity and chronic diseases are mostly found among adults of all age-groups. It has been estimated that in the Caribbean, half of the deaths due to chronic diseases occur in the age group 35 to 64 years. For example, total death rates in Jamaica and Guyana due to hypertensive diseases, stroke and diabetes exceed the same rates in the US and Canada (CFNI/PAHO, 1993). The prevalence of diabetes and hypertension were found to be 9.2/1000 and 54.2/1000, respectively, in the Dominican Republic in 1991 (cf. US and Canada).

b. Agricultural policy entry points

Food-based strategies to combat the high incidence of diet-related chronic diseases involve the agricultural sector on the food supply side. However, partnerships with the private sector and trade and commerce are essential. The average goals for the daily diet composition are known. For example, the Caribbean Food and Nutrition Institute recommends that the ideal composition of the average daily diet (consisting of 2250 kcals. and 43 gms. of protein) in the Caribbean is made up of 70% (of calories) of complex carbohydrates, 15 percent of animal foods, 10% of fats and oils, and 5 percent of refined sugar (CFNI/PAHO, 1993). Carbohydrates should come from: 30% cereals, 15% roots and tubers, 15% fruits and vegetables and 10% legumes and nuts.

The incorporation of dietary composition goals in agricultural sector policies becomes essential. National and local food production and marketing policies should aim at increasing market supplies of complex carbohydrate foods. Targeted food and nutrition education programs and social marketing through the mass media may over time start to produce changes in the structure of food demand, particularly in urban areas. Appropriate domestic food production and food import policies not only have to keep up with the structural demand changes, but can make positive contributions through changes in relative price relationships between fatty and low fat foods.

On a larger scale, food import policies, and particularly food processing standards, are likely to play a relatively more significant role. However, increased productivity in complex carbohydrate crops, coupled with improved efficiency in domestic marketing, can lower relative prices of these foods, even in processed form.

III. INFORMATION FOR THE DEVELOPMENT AND MONITORING OF NUTRITION POLICIES IN AGRICULTURE

In order to undertake food policy analysis, and identify the positive and negative effects of specific policy actions, it is necessary to:

- (a) quantify the impact and distributional effects on incomes, levels and allocation of household resources, household expenditure patterns, and nutrition;
- (b) understand response mechanisms of markets, and coping mechanisms of individuals and households, to changing social, economic and political conditions; and
- (c) identify the most vulnerable population groups for targeting of policy actions (von Braun, 1993).

Households surveys are the mainstays for data generation for policy analysis. More and more it is recognized nowadays that so-called qualitative methods, such as participatory rural appraisals can provide significant and complementary information, especially for the assessment of food and nutrition problems. These methodologies, however, position the urban and rural poor as objects for data gathering. Participatory action research (as distinct from research that employs participatory methods) positions the community members as the subjects, employs an inductive approach by starting from facts and reality (and not from theory), is multidisciplinary in nature, supports processes of change, and involves outsiders as active participants (and not as observers). It is particularly relevant within the context of local level participatory planning and community-based monitoring.

This is not the place to undertake an extensive review of data collection methods, their statistical qualities, etc. Instead we shall highlight the most relevant aspects: food-based indicators for assessment, analysis and monitoring, and data/information gathering methods most relevant to the agricultural sector. Particularly at field level, extension agents and community technical workers can easily be trained to undertake these tasks, and facilitate through training access to these methodologies to grass-roots groups.

A. Food security and food-based nutrition indicators

1. Household food security

Based on the previous discussion of household and individual food security, it is clear that food security is a multidimensional concept that has a strong time element, even in its most reduced form. Maxwell and Smith (1992) maintain that even simple, and the most often used, definition of food security implies multiple, and perhaps even, competing objectives for household behavior. This implies thus a broad range of food security-related indicators, and people's participation in defining a set of indicators, which are likely to vary with population and setting, and perhaps even over time. Resource availability, accuracy, relevancy, and

timeliness represent criteria for the selection of indicators, usually involving trade-offs (Frankenberger, 1992). The relevancy to local conditions, the accuracy and timeliness of indicators, and the information they provide, can be augmented by using more resources, for example.

Income measures, such as per capita income, are most often used to assess household food insecurity. It is notoriously unreliable, uni-dimensional and often represents the short-term, as an indicator of the household's vulnerability to food insecurity. A multi-country study produced a list of potential indicators to identify food-insecure households, either singly or in combination, and without relying on household income measures (Haddad, Sullivan and Kennedy, 1992). Some of these indicators will have greater relevance in rural than urban settings, and all need to be tested in different settings as to precision and resource requirements (see Box 3). Yet, these indicators are intuitively attractive because of the ease of obtention of the necessary information by community-based workers.

The household vulnerability indicators summarized in Box 3 may be useful to assess the household's present and future vulnerability to food insecurity, and its capacity to cope with a set of risks (Frankenberger, 1992). The assessment and monitoring of production and market risks is part of this system; rainfall monitoring, crop forecasting, agricultural production data, vulnerability mapping, local early warning systems, timely price data and market assessments are methods to monitor such aggregate risks.

Additional indicators, which are food-based and appear relatively easy to construct, include:

- **Food frequency:** number of food items consumed, in total or by food groups; number of meals consumed/day, or number of meals that included specific foods; can be used to rank households as to high, average or low food consumption security.

Self-sufficiency indicators:

- **Food storage:** number of months from harvest that stored foods for household consumption will last;
- **Subsistence potential ratio:** amount of food the household can produce (based on farm size, expected crop yields) over a year in relation to household food requirements (based on household size and composition, and age- and gender-specific energy allowances) per year.
- **People's perceptions of their food security status:** number of months people feel that they can supply their own food needs from all sources.

Self-sufficiency indicators are more applicable in communities where households heavily rely on their own production as a source of food supplies.

BOX 3

INDICATORS TO IDENTIFY FOOD-INSECURE HOUSEHOLDS

DEMOGRAPHIC INDICATORS

- Household size: large
- Dependency ratio: high
- Number of under-five children present: many

ENVIRONMENTAL INDICATORS

- Number of rooms/person: few
- Quality of drinking water and sanitary facilities: poor

RESOURCE BASE

- Land area cultivated and owned (rural areas): little or none
- Occupational status: low skill

ACCESS TO FOOD

- Number of unique foods consumed/available: few
- Number of missed meals: many
- Quality of daily diet, as perceived by respondent: poor

Source: Haddad, Sullivan and Kennedy (1992)

2. Micronutrient deficiencies

Relevant indicators for micronutrient deficiencies can be divided into: biological, illness-related, socio-economic, and food and dietary (see the module, *Food and Nutrition Policies in Health*). Socio-economic indicators indirectly relate to access to food, and to underlying conditions for health. Focusing on food and dietary indicators here, we have reproduced in Table 2 what represents a recent consensus about the relative usefulness of specific indicators for identification of high-risk groups or regions (assessment) and for planning, monitoring and evaluation of food-based programs (WHO/UNICEF, 1994). The material is based mostly on experience with vitamin A programs.

TABLE 2

Food-based Indicators Related to Micronutrients for Assessment, Planning and Monitoring and Evaluation

Indicator Group	Assessment	Planning	Monitoring and Evaluation
A. Food and Diets:			
1. Market Availability of Food (by seasons)	+++	+++	+++
2. Household Food Availability (by seasons)	+++	+++	+++
3. Dietary Patterns	+++	+++	+++
4. Beliefs and Attitudes about Food		+++	+++
5. Growth and Development (Ht/Age; Wt/Ht)	+		+
B. Socio-economic:			
1. Income and Employment	++	+	
2. Access to Land/Land Ownership	+	++	
3. Access to Agricultural Services and Inputs	+	++	
4. Education/Literacy	+	+++	
5. Water and Sanitation	+	+	
6. Access to Health Services	+	++	

+ = relative strength of usefulness

Source: WHO/UNICEF (1994)

Market and household food availability indicators have relatively high functional usefulness, particularly when they capture seasonal variations in availability. Dietary patterns should be stratified by ethnic and socio-economic groups, as well as ecological zones. Food consumption patterns of especially vulnerable groups (pregnant and lactating women; under-five children) should be measured, using rapid assessment techniques, including food frequency surveys. A group of households or of women or children is said to be at risk of vitamin A deficiency when less than three-fourths consume vitamin A-rich foods three times or more a week. Food beliefs and attitudes towards micronutrient-rich foods are especially important for planning food-based programs, and social marketing and educational programs.

Participatory methods are very useful here. Even though there often is an association between the prevalence of micronutrient deficiencies and the degree of growth failure in children, this association is not strong enough to reliably use growth indicators for assessment and monitoring and evaluation of food-based programs.

Income and employment indicators are particularly important for the assessment of high-risk groups in urban areas. Access to land, and to agricultural extension services and inputs, are important for planning programs that aim at household production of micronutrient-rich/enhancing foods.

B. Data collection and information-gathering methods

1. Relevant methods

The data for most of the household-level indicators described above are generated through single-visit or multi-visits, cross-sectional surveys. These are sometimes combined with physical measurement taking (physical monitoring), as with direct measurement of land plots, of food portions, or of body dimensions (weight, height). Multi-visit surveys are specifically designed to measure seasonal variation in household income, food availability, morbidity and nutritional status. Agricultural censuses are only periodically undertaken (e.g., every 10 years), are rather complete and cover the whole population. They are useful to measure long-term changes in agricultural indicators, but are very costly, resource-intensive and rarely provide timely results. Remote sensing techniques relate to measurement of land use, and are used for crop, livestock and drought predictions. Group surveys are applied to assess institutional behavior; groups may consist of farmers associations, neighborhood committees, etc.

Specific participatory methods that have been applied in the past to collect food policy-related data include: matrix ranking, to compare different crops according to a set of people-defined criteria; seasonal diagrams, to demonstrate seasonal food availability, and social mapping, to provide a breakdown of a village population according to certain characteristics (Buchanan-Smith, 1993). Resource mapping techniques which inventory land, water, and plant resources, offer opportunities to involve directly local people and their knowledge base. Semi-structured interviews with key informants, as well as focus group discussions are also useful methods. Maxwell and co-workers (1989) used these and other rapid rural appraisal techniques, combined with village walk-throughs, to gain a better understanding of the causes, dimensions and characteristics of village-level food insecurity ("rapid food security assessment"). Focus group discussions are particularly useful to understand food beliefs and attitudes, or how people perceive their food security.

There are complementarities between participatory methods and more formal/structured ways of data gathering such as household surveys: the former can contribute to the efficiency of the latter, by sharpening and increasing the local relevancy of questions, and ensuring that the questionnaire covers key issues with weights appropriate for the specific setting.

2. Considerations for method selection

Scherr and Vosti (1993) have provided an useful framework for the selection of specific data collection method(s) for policy analysis. This framework makes clear that there are no recipes, and that the actual selection will need to be based on the specific setting, purpose, and the relative weights that are given to a number of factors. We summarize only parts of the framework here. A comparative evaluation of the most relevant methods for different purposes is also presented (see Box 4).

BOX 4

COMPARATIVE EVALUATION OF DATA-GATHERING METHODS FOR AGRICULTURAL POLICY DECISIONS AND ACTIONS AND COMMUNITY-BASED ACTION PROGRAMS

Method:	Policy Decisions:	U S E S: Policy Actions:	Community Action Programs:
Census	4	1	1
Remote sensing	4	2-3	1
Resource inventory/mapping	4	4	4
Single-visit survey	4	3	2-3
Multi-visit survey	4	1-3	1-2
Physical monitoring survey	4	4	2-3
Group survey	4	4	2-3
Key informants	4	2-3	3
Ethnographic methods	4	2-3	4
Case studies	4	4	4
Focus group interviews	4	4	4
Participatory rapid appraisal	1-2	2-4	4

(1=low; 2=moderate; 3=high; 4=very high).

Source: Scherr and Vosti (1993)

Factors to be considered in the selection of data-gathering methods:

Scope of Analysis:	Type of analysis Statistical representation Unit of analysis Spatial relationships Community involvement Long-term potential for use of the data
Data Characteristics:	Level of aggregation Precision requirements of population estimates Required accuracy of measurement Population variability Frequency and period of data collection Informant sensitivity
Logistics and Costs:	Need for prior information Accessibility of informants Financial resources Human resource requirements Speed of implementation/analysis
User Needs:	Data quality versus speed of analysis Data quality versus community participation Short- versus long-term data needs Evidence versus proof

<u>Method</u>	<u>Type of Analysis</u>	<u>Unit of Analysis</u>
Census	a,b	1,2,3
Remote sensing	a,b	3
Resource inventory/mapping	a,b	3,6
Single-visit survey	a,b	1,2
Multi-visit survey	a,b	1,2
Physical monitoring survey	a,b,c	4
Group survey	a,b	3,5,6
Key informants	b,c	6
Ethnographic methods	c	1,2,6
Case studies	c	1,4,6
Focus group interviews	b,c	3,6
Participatory rapid appraisals	a,b,c	1,2,6

a=levels; b=changes in levels; c=processes of change
1=individual; 2=household; 3=geographic area; 4=individual plot; 5=group; 6=community

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The preferred method(s) of data gathering will vary with purpose and users. Those involved in agricultural policy decisions will typically be concerned with good assessments of problems that fall within the domain of the agricultural sector, and with the impacts of sector policies. Timeliness of results will be more important for policy decisions than accuracy of measurement or data quality. There is a need for both short- and long-term data, for example, to cover both more immediate and basic causes of food insecurity or of high prevalences of micronutrient deficiencies. Participatory methods may be very useful to assess at local level behavioral responses to specific policy actions, and perhaps be less useful to measure policy action impact, except as perceived by the beneficiary groups.

Local level data gathering methods will be important for agricultural policy actions, to monitor program/project implementation processes, and to foster community participation and empowerment. Quick turn-around of results is thus essential, but needs to be traded-off with some analytical rigor in measuring impacts. Participatory data gathering methods are highly useful for community-based actions, as community participation and timeliness have a greater weight than data quality or rigorous statistical analysis. Simple physical monitoring and household surveys can also be useful, and community members and local leaders can easily be trained to implement these, assuming that other methods cannot provide the required information/data to design community actions.

IV. BASIS FOR THE INCORPORATION OF NUTRITIONAL OBJECTIVES IN AGRICULTURAL POLICY DECISIONS

A. The need for policy advocacy

In order to strengthen the nutritional effects of agricultural policy actions, policy advocacy activities will be required. Policy advocacy should be seen as part of a broad-scale movement of social mobilization for change, involving different population groups and institutions (see Box 5). It includes, but is not limited to, policy lobbying for narrow private interests. The need for policy advocacy arises in this particular context because:

- **Low priority of nutrition goals in economic development plans**

Until recently, national economic development plans did usually not deal with better nutrition as a goal of development. Yet, such plans and their operationalization through policy actions, were meant to guide the public sector resource allocation. One of the main objectives of the World Summit for Children and the International Conference on Nutrition was to put nutrition on national policy agendas as a major concern. Yet, it remains to be seen whether this national policy concern will persist and whether national plans of action for nutrition will be fully incorporated in new economic development plans.

BOX 5

DEFINITION OF SOCIAL MOBILIZATION

Social mobilization is a broad-scale movement to engage large numbers of people in action to achieve a specific development goal through self-reliant efforts. It is a planned process that seeks to facilitate change and development. It takes into account the felt needs of the people, embraces the critical principle of community involvement, and seeks to empower individuals for action.

Source: Ling and Hewett, 1992

■ Nutrition as a major policy concern of the health sector

Malnutrition is usually seen by national policy makers as a clinical phenomenon and as falling within the policy sphere of health, and not as an outcome of a complex socio-economic, cultural and political system. The two recent world events have probably contributed to raising in general political and institutional awareness of the need for multi-sectoral approaches to combat nutrition problems. However, this broad awareness may not have filtered through when it comes to specific agricultural strategies and policy actions.

■ Apparent inconsistencies between agricultural policy objectives and goals, and nutritional outcomes

Agricultural sector policies are typically production-oriented, aim at maximizing the aggregate value of agricultural production, and are more efficient at service delivery for large-scale producers who are often explicitly targeted.

The previous sections have attempted to demonstrate that there are clear linkages between agriculture and nutrition, and that modifications of the nature of those linkages, through agricultural policy actions and intersectoral policy coordination, can potentially alter nutrition outcomes at the household and individual level. However, these linkages are often not clearly understood by agricultural policy makers. Providing them with this understanding should be one of the goals of policy advocacy.

Policy advocacy should aim at creating a social (and eventually a political) demand for better nutrition through agricultural policy actions. It should take place at central and local levels, and ideally involves different actor groups, most prominently international donors, private organized groups (farmers, consumers, private sector associations), non-governmental organizations, technical and professional groups, etc. The ultimate aim of policy advocacy should be to create at central level enabling and supportive policy and institutional environments that reflect agricultural sector commitment to national nutrition goals, promote

flexible structures of policy action implementation at all levels, and strengthen intersectoral policy coordination. In Ecuador, for example, NGOs are taking the initiative in attempting to provide new orientations for public policies, and to achieve broad implementation of participatory approaches in planning and administration in the public sector (Bebbington, 1991). There is a similar example from Bolivia (Box 6).

BOX 6

POLICY ADVOCACY BY NON-GOVERNMENTAL ORGANIZATIONS IN BOLIVIA: PROMOTION OF ALTERNATIVE POLICIES AT THE LOCAL LEVEL

Groups of NGOs in Bolivia have started to form networks at central and departmental levels to coordinate and collaborate on agricultural research and extension projects. Sharing of information and mutual learning are key in this process. The intended goal is that the integrated NGO projects will eventually serve as models for similar initiatives in the public sector. Ultimately it is hoped that the NGO networks can develop local policy alternatives, and get these adopted by the government. In addition to attempting to influence government policy, efforts will be put forth by these networks to press for greater decentralization in public policy making, leading to greater flexibility and adaptability of policy alternatives to local conditions. The sharing of information and mutual learning serve to develop common positions among the NGOs on technical solutions when entering into partnerships with public sector agencies.

Source: Bebbington (1991)

External donor agencies, such as USAID, can and do participate in in-country policy advocacy, often to promote their own policy agendas. This has been done very effectively, for instance, in Honduras where these efforts culminated in the adoption of the 1992 Agricultural Sector Modernization and Development Law. In addition to intensive and continued policy dialogue with national policy makers, external agencies can also: (a) promote policy dialogue among national and local development groups by sponsoring policy workshops and publications, (b) bring policy concerns and solutions of non-governmental institutions to the attention of national policy makers, (c) sponsor training in policy analysis for staff of public sector and non-governmental agencies, and (d) sponsor inter-country exchanges on policy experiences. In the above-cited Ecuadorian case, an external agency (Overseas Development Institute in London) sponsored a collaborative research project among a number of NGOs in the Andean region to devise strategies to promote NGO-Government partnerships, and to link local level projects with regional and national policies and development plans.

B. Tools for policy advocacy

1. Formulation and dissemination of coherent arguments

Sound arguments need to be developed that demonstrate to policymakers and to other actors the importance of incorporating nutrition goals in agricultural policy decisions and actions. The previous discussion of the agriculture-nutrition linkages provides a general framework within which to develop such arguments. Country-specific analyses will need to be undertaken, specifically focusing on, but not limited to, providing an economic rationale as well as demonstrating how nutrition can further agricultural policy objectives. Policy analysis can focus on estimation of aggregate net economic benefits of certain nutritional outcomes, or on providing opportunities for learning from specific success stories (and failures), i.e., the case study approach. The former may address the question: what nutrition can do for agricultural development. Data availability is likely to be a limiting factor for this type of analysis, but even gross estimates may provide powerful arguments (see, for example, Behrman, 1992; Immink, et al., 1982).

Case studies can link specific agricultural policy actions with local level nutrition outcomes. Policy analysts are perhaps better equipped to undertake aggregate analysis and estimation, but case studies should fully involve farmers, women's groups as well as agency technical staff at local level.

Effective dissemination of the study results is key in feeding into policy advocacy. This may involve synthesis work of different studies in published form by policy analysts (see e.g., Kennedy and Bouis, 1993). This form of dissemination, particularly if coupled with face-to-face dialogue and discussion, may be effective in reaching high-level policy makers. However, to reach a broader audience often requires a process of de-technification of study results and the use of popular education/communication methods, thus directly involving other actors in the dissemination process. These materials can be transformed into educational messages which are then disseminated through existing infrastructure: schools, churches, mass media (social marketing). These materials can also be used to train agricultural extension agents, and to raise awareness among farmer and community groups, facilitated by extension agents.

2. Establishing common grounds for policy dialogue among different actors

■ National consensus building

Nutrition must be brought onto the national development agenda, and the role of agriculture in nutrition clearly understood. In-country efforts to develop national plans of action for nutrition are often confined to a small group of institutions or individuals at central level. A sense of national ownership is usually missing. Broad-based consensus needs to be built among different actor groups, regarding goals, strategies, concrete policy actions as well as self-reliant actions at local and grass-roots levels. The goals of the different actor groups are

not necessarily compatible with national nutrition goals, thus requiring a process of re-iterative negotiations.

■ **Mechanisms for continuous dialogue**

- institutionalize mechanisms for continuous dialogue between agency staff, NGOs, private sector institutions, and popular organizations;
- establish a general policy framework that is flexible, allows multiple adaptations at local levels, and that has built-in feedback mechanisms to re-design policy actions over time, based on local experiences;
- scale-up projects in parts, starting with the non-controversial parts of successful project elements; once parts of the pilot experience show positive outcomes, normalize these immediately, without waiting for the final evaluation of the total pilot experience.

3. Internal policy advocacy

Policy advocacy is usually seen as outside groups attempting to directly or indirectly influence policy decisions of an institution. Indeed, formulating coherent arguments, as described in section 1. above, would presumably be undertaken by those who have a personal or professional interest in having agricultural policy decisions reflect an institutional concern for the amelioration of nutrition problems. However, it is also possible to envisage a group of individuals within the Ministry of Agriculture (or other agricultural sector institutions) engage in advocacy for the purpose of change in sector and/or institutional policies. To be effective, internal policy advocacy efforts can be seen as consisting of the following processes:

- sensitizing of certain key staff members to nutrition concerns;
- establishing within the institution a focal point for food and nutrition, staffed by knowledgeable people;
- in-house discussions, and knowledge and information sharing; and
- in-house drafting and discussions of new policy guidelines.

The initiative is to be taken by the focal point for food and nutrition, or by a group of nutrition-conscious staff members. This group should assume responsibility for facilitating in-house dialogue, synthesizing available empirical evidence, formulating coherent arguments and drafting policy guidelines for discussion. Legitimization of the group's work can be provided through the participation of outside experts and policy analysts in in-house discussion group, workshops and seminars. In-house dialogue about nutrition issues in

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agricultural development must be institutionalized as a continuous process, requiring the focal group to educate itself continuously and to be the source of the most updated information on nutrition issues, local policy action impacts, etc. The group must also have the capacity to undertake timely nutritional impact studies of new agricultural policy initiatives. Lastly, the group must develop and maintain strong ties with food and nutrition focal points in other institutions, as well as with researchers, policy analysts, local non-governmental organizations and organized grass-roots groups.

V. PROMOTING BROAD-BASED PARTICIPATION IN AGRICULTURAL POLICY ACTIONS

Participation is a key element in social mobilization. It refers not only to participating in decisionmaking, but also to taking active part in specific actions and sharing in the responsibility for those actions. One important challenge is to link local level initiatives and participatory actions with agricultural policy decisions at the central level (Thrupp, Cabarle and Zazueta, 1994). Elsewhere it has been argued that food security issues require a convergence of technical and social aspects, and thus strong partnerships between line ministries and development-oriented NGOs in Latin America make good sense (Arnauld, 1992).

Why is people's participation important for nutrition and agricultural policy actions?

In a broad sense, effective people's participation is development, i.e., it is an end, and not just a means towards an end (Oakley and Marsden, 1984). It has been demonstrated that when people are directly involved in planning, implementing, and monitoring and evaluating of local level projects, these tend to be more effective and sustainable. In terms of Korten's "fit model", people's participation will contribute to producing a better "fit" between the felt needs and priorities of the beneficiary group and the project's outputs (services, products) (Korten, 1984). At the same time, people's participation can contribute to institutional learning processes, builds people's capacity (with significant spill-over effects), and creates a real sense of ownership in the project, thus creating conditions for sustainability.

In a narrow sense, people's participation can help to strengthen the nutritional impacts of agricultural policy actions in several ways:

■ Holistic visions and approaches

People will analyze nutrition problems from a holistic perspective, and not out of narrow sectoral concerns. Their assessment and analysis focus on root causes, identify needs for multisectoral, technical solutions as well as relevant ways of addressing social and cultural constraints. People's participation facilitates local level interinstitutional coordination to address nutrition problems in a holistic way, and creates conditions to make policy actions by different sectors more compatible in dealing with nutrition problems.

■ **Incorporation of indigenous knowledge**

Rural people hold a significant body of knowledge about locally adapted farming practices, and local crops with low input requirements, including indigenous food crops. By taking this indigenous knowledge as a starting point, farming systems can be developed jointly by farmers and agricultural technicians, that are highly efficient, require a minimum of agrochemical inputs, fully take into account household labor constraints, reduce the need for high-cost extension services and are environmentally friendly. Nutrition-related outcomes would include: higher household income, greater household food availability, more time available for child nurturing, and lower energy expenditure requirements for adult women and children.

■ **Knowledge of the local community**

People understand the social dynamics of the communities they live in. They know which households are vulnerable to food insecurity and malnutrition, and understand the reasons why. This knowledge can facilitate the development and implementation of specific actions with greater effectiveness. Community dynamics and organization may eliminate the need for targeting of specific actions, and instead rely on a community-wide self-targeting process. Targeting would be based on communities, and not households, thereby often increasing the cost-effectiveness (as well as contributing to community solidarity).

■ **Informal experimentation and learning by doing**

Participation by farmers in technology development at the field level usually means that farmers are more likely to learn by doing and modify techniques, rather than to dismiss them when they do not initially provide the expected results (see Box 7). In the same way, villagers directly involved in planning and implementing actions are more likely to engage in self-analysis with a view towards improving their effectiveness.

■ **Multiplier effects**

Knowledge that people acquire through their participation in assessment and analysis of food and nutrition problems, development of new techniques, or planning of specific actions, for example, will quickly be disseminated through existing informal communication networks to other farmers, villages, or neighborhoods. This horizontal transfer of knowledge is usually much more effective, and reduces the burden on formal extension services. When it involves knowledge acquired through participation in ongoing actions, it facilitates up-scaling and adoption, in adapted forms, of such actions.

There are a number of general constraints to people's participation in agricultural policy action planning, implementation and evaluation (see Box 8). Institutional constraints can only be overcome if there is a genuine institutional commitment to this end, and this commitment

BOX 7

THREE EXAMPLES OF SUCCESSFUL FARMER EXPERIMENTATION IN USAID-ASSISTED COUNTRIES IN LATIN AMERICA

- Small farmers in San Martín Jilotepeque in Guatemala were being taught how to grow groundnuts. At their own initiative they started to intercrop groundnuts with the traditional beans. As a result, the beans, which mature more quickly than groundnuts, were harvested before the groundnuts needed all the space, and production was fifty percent higher than when groundnuts were planted separately.
- Farmers in Chapare in Bolivia used traditional jungle slash-and-burn techniques, and generally lost half of their rice production to insect pests. Extension workers recommended application of expensive and highly toxic insecticides, which often were not available locally. One farmer, with largely undamaged rice crops, had been experimenting on his own for three straight years. He had kept his fields insect-free by: clearing the bush in such a way that the wind circulated well, thoroughly burning host weeds, and planting on a certain date. These methods did not incur any expenses and produced no toxic residues.
- The WN/ACORDE/Recursos Naturales El Rosario Project in Honduras promoted the production of velvet bean (local legume) as an intercropped green manure. Farmers found that it could also be used as a mulch with significant advantages. The small loss in soil fertility caused by mulching the green manure rather than burying it, was more than offset by the weed control effects, maintenance of more moisture in the soil, availability of the bean for human consumption, and the easier processing of the bean by cutting it down rather than burying it.

Source: Cited in Reijntjes and Hiemstra (1989)

must clearly be reflected in institutional policies and actions. Vertical decentralization, without eliminating institutional responsibilities, can provide a basis for shared responsibilities for agricultural actions at local level. Community-level constraints must be addressed through grass-roots empowerment, a process in which the agricultural sector can play an important part. Structural constraints are much more difficult to deal with; they can only be removed through democratic processes.

Promotion of broad-based participation in agricultural policy actions involves such strategies as: institutional decentralization, institutional capacity building, grass-roots capacity building,

BOX 8

**LIMITATIONS ON PEOPLE'S PARTICIPATION IN
PLANNING, IMPLEMENTATION AND EVALUATION OF
POLICY ACTIONS AT THE LOCAL LEVEL**

**INSTITUTIONAL
LIMITATIONS:**

- Centralized planning and implementation
- Lack of inter-sectoral coordination
- Universal technical solutions
- Pre-defined target groups
- Pre-defined implementation norms
- Promotion of hierarchical relationships between technicians and farmers
- Political need to show quick and positive results

**COMMUNITY-LEVEL
LIMITATIONS:**

- Lack of social cohesion
- Elite leadership
- Lack of democratic organization
- Precedents of dependency, passive participation, marginalization
- Displacement of indigenous knowledge
- Lack of access to technical, economic information
- Lack of experience with bureaucratic processes
- Short time horizons

**STRUCTURAL
LIMITATIONS:**

- Ideologically based values and attitudes
- Economic and political power structures

to facilitate the linking of grass-roots initiatives with agricultural policy decisions.

A. Institutional decentralization

The overall objective is to create institutional conditions which promote local level decisionmaking and action implementation, increasing the efficiency with which agricultural policy actions impact on nutrition by taking more adequately into account locality-specific needs, priorities and constraints.

Institutional decentralization can vary considerably in degree and impact, and can be horizontal or vertical. Horizontal decentralization is relevant here, in the sense that national plans of action for nutrition attempt to decentralize policy responsibility for national nutrition goals among a number of sectors and institutions (see Box 9). Vertical decentralization, specifically in the ministry of agriculture, facilitates local level participatory planning, as well as the implementation of policy actions, and offers better opportunities for linking grass-roots initiatives with agricultural policy decisions. Vertical decentralization has variously been characterized as (UNDP, 1993):

- deconcentration: limited administrative discretion for local offices, major decisions continue to be made at central level;
- delegation: increased authority and decisionmaking power for local level managers, but subject to review and reversal at the central level;
- devolution: independent decisionmaking power with full responsibility by local level managers for the design and implementation of policy actions, and for the management of institutional resources.

BOX 9

The National Food and Nutrition Plan (1995-2001) of the Dominican Republic divides up the first-level responsibility for implementation among the Ministry of Health and Social Welfare ("Secretaría de Estado de Salud Pública y Asistencia Social"), Ministry of Agriculture ("Secretaría de Estado de Agricultura") and the Technical Secretariat of the President's Office ("Secretariado Técnico de la Presidencia"). The Plan anticipates in addition the direct participation in its implementation by a number of public sector agencies, local government, NGO's, private companies, and organized community and other grass-roots groups. Several public agencies and NGOs participated at various stages in the drafting of the Plan. Direct involvement in the planning stage aimed at creating a sense of institutional ownership in the Plan, and facilitating intersectoral policy coordination during implementation.

Devolution offers perhaps the best opportunity for adapting agricultural policy actions to local level conditions and constraints, as it involves decentralization of service delivery, intra-institutional decisionmaking and of institutional resource management, avoiding major inconsistencies among these tasks. However, it appears fair to state that in actuality,

ministries of agriculture in LAC countries do not get beyond the stage of deconcentration. At the same time it should be recognized that devolution can re-enforce existing disparities in technical and managerial capacities among local offices, and thus inter-regional inequities in service delivery (coverage, quality).

B. Institutional capacity-building

The general objective is to improve the technical, managerial and organizational capacity of institutions to become effective partners in the planning, implementation, and monitoring and analysis of agricultural policy actions with nutrition objectives. Some specific approaches may include:

- Within-institution learning which involves the selection of representative pilot experiences for later upscaling, and testing in action of agricultural policy actions, taking into account local diversity in constraints. The pilot experiences should be located in localities (clusters of villages or urban neighborhoods), which are part of the existing governmental administrative structures, thus creating opportunities for direct involvement by local authorities. Opportunities and incentives should be created for technical staff to experiment in the field, and report back for general learning.
- Re-alignment of institutional structures. A management review may concentrate on defining internal structures that emphasize functional linkages between decisionmaking, capacity building, resource mobilization and action implementation and analysis, over hierarchical order and specialized functions (Bosnjak, 1990). Institutional incentives should be put in place that promote within-institution, horizontal coordination, such as e.g., among extension agents who deal with different production aspects. Performance evaluations of institutional staff should include feedback from the institution's clients on the effectiveness of the services provided, and should be seen as learning opportunities rather than judgments of staff competence.

C. Grass-roots capacity-building

The overall objective should be to create conditions which allow grass-roots groups (smallholder farmers, landless rural poor, women's groups, indigenous peoples, low-income urban consumers) to become active partners in planning, implementing and analyzing agricultural actions at local level, based on the principles of self-determination and self-reliance.

Local participatory planning and project implementation is one strategy to overcome the community-level constraints for participation. Local agricultural extension personnel can be trained to be an effective agent of change in dealing with nutrition problems. In order to be effective partners, both the extension staff and the community need to:

- understand the food and nutrition situation in the community, and jointly prioritize food and nutrition problems;
- identify existing constraints, particularly for high-priority food and nutrition problems;
- design specific actions to address high-priority food and nutrition problems;
- identify available resources at community level, and the needs to mobilize external resources, technical assistance, etc.;
- organize to implement specific actions, and establish institutional linkages; and
- design a simple monitoring system to turn the specific actions into continuous learning experiences.

To initiate the participatory planning process requires selection of the communities to become involved. Available information and data can assist in identifying areas or regions where food and nutrition problems are likely to be the most critical. Local rapid reconnaissance can help to confirm the initial assessment, as well as assist with the identification of communities where self-help activities are emerging or in progress. Once a number of communities have been identified, the first steps involve: starting a food and nutrition dialogue with the community, stimulating interest in the community in food and nutrition issues (by starting up small-scale, food and nutrition-related activities, and using popular education methods), identifying existing organizations in the community, and establishing linkages with ongoing community projects, if any (FAO, 1993).

Institutions in the agricultural sector, in partnership with development-oriented NGO's, can also contribute to grass-roots empowerment and capacity for self-determination, including the capacity to negotiate effectively with other agents of change. Some strategies towards this end include (FAO, 1992):

- transform existing popular organizations, such as farmer cooperatives, into autonomous organizations that are not dependent on a government institution;
- institute training programs in leadership, simple planning techniques, resource management;
- promote the mobilization of local resources by members of community groups;
- facilitate/provide specialized technical training for members selected by the community; and

- accord formal standing to popular organizations, but reduce to a minimum the requirements for their formal recognition.

VI. INTERSECTORAL POLICY COORDINATION

As has repeatedly been emphasized, there is a clear rationale for the need of intersectoral policy coordination between the agricultural sector and other sectors, when there exists a true policy concern for maximizing the impact of agricultural policy actions on nutrition. This rationale is based on existing agriculture-nutrition linkages, and on the fact that nutrition problems have multifaceted causalities, and often require simultaneous and multiple policy actions in order to have a significant impact. What will differ among high-priority population groups is the relative weight that food- and non-food-based strategies should be given at any moment in time, as well as the sequencing over time of different strategies.

Horizontal decentralization among institutions to be involved in mitigating nutrition problems is a way to mobilize broader sectoral participation, but increases the need for intersectoral coordination. National efforts in the LAC region to promote such intersectoral coordination through semi-autonomous food and nutrition councils, or a food and nutrition planning unit in the central planning office or the president's office, need to be carefully examined as to their effectiveness. National experiences are likely to differ with regards to these models. The separation of decisionmaking from action planning and implementation in these models may be a serious draw-back. A small, but strong focal point for food and nutrition in the Ministry of Agriculture offers perhaps a good opportunity not only for internal policy advocacy as argued above, but also to strengthen inter-institutional communication flows.

Area-based multisectoral planning and action implementation is often a good strategy to promote intersectoral coordination at local level. In the first place, this approach recognizes the multifaceted nature of nutrition problems and possible synergistic effects of multi-sectoral policy actions, resulting in positive efficiency outcomes. Secondly, policy actions can be tailored in accordance with local constraints. Thirdly, it facilitates targeting on a community basis, since high priority areas are involved. Fourthly, it facilitates broad-based participation and mobilization. Lastly, it facilitates inter-institutional communication and collective action, particularly in conjunction with intra-institutional re-alignment and institutionalized learning processes. With a strong commitment to national nutrition goals by the agricultural sector, the Ministry of Agriculture can become a lead agency in area-based planning for nutrition in rural areas.

VII. CONCLUSIONS

Efforts to incorporate nutrition in agricultural policy decisions and actions involve creating a social, and eventually a political, demand for better nutrition on the one hand, and a technical, organizational and institutional capacity to respond effectively to that demand

through food-based strategies and actions at central, local and community level. Nutrition may be seen by many as a technical field, with its own concepts, jargon and scientific methods. Food, on the other hand, is non-technical, it is real to every one in society. And to the agriculturists, food represents plants and animals. Thus, it may be much easier to approach nutrition from the food-side than from the health side in mobilizing different actors. Yet, nutrition is usually seen as a health sector concern. A clear understanding of the two-way linkages between agriculture and nutrition is key in policy advocacy work: better nutrition is not just a desirable social outcome, it represents an economic investment that contributes to agricultural development.

The food and nutrition problems that have been highlighted in this document directly involve a number of sectors and actor groups. The actor groups involved in agricultural policy decisions and actions, have a distinct role to play, whether it is in relation to household food insecurity, high prevalences of micronutrient deficiencies or high incidences of diet-related chronic diseases. Effective intersectoral policy coordination at central, local and community levels is needed to deal with food and nutrition problems in a holistic way. In reality, however, intersectoral policy coordination at central level often fails. Local level partnerships among different actor groups, including communities and popular organizations, offer perhaps better opportunities for holistic actions to combat malnutrition. For such partnerships to be effective requires institutional changes, and capacity building at grass-roots level beyond food and nutrition knowledge.

From a broad intersectoral perspective, policy trade-offs are likely to be involved as well. The broad policy question is: what sectoral, or combinations of sectoral policy actions will combat the problem most efficiently, and provide the best option(s) to achieve national nutrition goals? For example, agricultural policy actions to combat micronutrient deficiencies focus on modifying dietary intakes of vulnerable population groups. Alternative policy actions, that "reside" in other sectors, include: supplementation (health), food fortification (trade and commerce), and public health measures to decrease the incidence of infectious diseases, including food safety measures. These policy actions can be compared in terms of: program complementarity, cost-effectiveness, and sustainability (see Box 10). The latter two are particularly relevant for considering policy options, though considerations of equity and local level replication are important, too.

The USAID-assisted countries in the LAC region are all at various stages of preparing their national plans of action for nutrition. Admittedly, the political will and the active participation of various sectors in the preparation of these national plans also varies from country to country. The fact that malnutrition reflects broad social, economic and institutional problems, and thus that the implementation of effective solutions requires multisectoral participation in planning, implementation and monitoring, is often not effectively being disseminated as a mobilization tool.

BOX 10

PROGRAM COMPLEMENTARITIES AND LINKAGES FOR THE PREVENTION OF MICRONUTRIENT DEFICIENCIES

PROGRAM	Program Complementarity	Cost-effectiveness	Sustainability
A. Dietary modification Iron Vitamin A	XXX XXX	XX XX	XXX XXX
B. Supplementation (targeted) Iron Vitamin A	XXX XX	XX XX	X XX
C. Food fortification Iron Vitamin A	X X	XXX XXX	XXX XXX
D. Public health measures (e.g., diarrheal disease control, infection/infestation control) Iron Vitamin A	XX X	XX XX	XXX XX

XXX = strong XX = moderate X = weak

Source: WHO (1994)

Some of the countries have prepared "national plans of action for food and nutrition," reflecting the need for sectoral participation beyond health. The planning efforts, including the setting of nutrition goals and targets, still remain very much centralized and narrowly focused, reflecting top-down institutional structures. The message here is that, preparing and implementing a national plan of action for nutrition that will effectively and sustainably contribute to mitigating food and nutrition problems, involves a great deal more than just formulating narrow sectoral policy options. Hopefully, the ideas presented in this document contribute to a process of in-depth analysis and learning on the part of different actor groups,

at community, local and central levels, so that all these groups and institutions take full ownership of the national plan of action for nutrition, and turn it into an effective operational tool.

Finally, from the outset we stated that this document is not meant to provide recipes for the incorporation of food and nutrition goals and strategies in agricultural policy decisions and actions. Rather, the intent is to provide methodological and operational guidelines. Much of the material is presented without reference to any specific country in the LAC region, or to any specific locality. The usefulness of this guide depends very much on whether different actors involved in agricultural policy formulation and action implementation find the ideas presented here relevant and appropriate for their day-to-day activities. The in-country "testing" of this draft guide in a number of different settings can contribute to: (a) sharpening and enriching these guidelines, through action-learning, by actually implementing some of the presented ideas, and (b) generating for inclusion in the guide, additional and specific examples that further illustrate important points. Case studies that retrospectively analyze the processes whereby agricultural sector strategies and policies adopted nutritional objectives, or failed to do so, in certain LAC countries, may also contribute important lessons, and provide reality checks for these guidelines.

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**GUIDELINES FOR SECTORAL FOOD AND NUTRITION POLICIES IN
THE COUNTRIES OF LATIN AMERICA AND THE CARIBBEAN**

FOOD AND NUTRITION POLICIES IN EDUCATION

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Claudia Uribe

*Prepared for the U. S. Agency for International Development under
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University Research Corporation/International Science & Technology Institute
7200 Wisconsin Avenue, Suite 600
Bethesda, MD 20814*

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I. INTRODUCTION

This document presents an overview of the current status of basic education in Latin America and surveys various studies which explore the relationship between education and the population's nutritional and health status. The nutritional factors that influence the possibilities of children's learning are also examined, and some lessons from programs to improve nutrition in schools are presented. This presentation attempts to give decision makers in the education and health sectors information for dialogue and orientation of policies in developing comprehensive programs in these two important areas. This module was originally written by Claudia Uribe, LAC HNS consultant. It was then reviewed by the participants in two subregional workshops on Food and Nutrition Policies and Action Plans held in San Jose (Costa Rica) and Santa Cruz (Bolivia) in July 1995, who included high level officials from the Ministries of Health, Agriculture and Education of 20 countries in the region. The present version incorporates the suggestions and recommendations which came out of the two workshops.

Despite the progress made in nutrition in Latin America, hunger and malnutrition continue to be a major problem in several countries of the region. The growth of absolute poverty in the 1980s helped increase the food insecurity of many families, especially that of their youngest members. It is estimated that around 6.5 million children under 5 years in the region suffer from moderate to severe malnutrition, representing 12% of that age group (Mora and Wickham, 1994). Numerous studies suggest, however, that a relationship exists between greater schooling and lower indices of malnutrition such that while poverty is a structural and underlying cause of malnutrition, education is a powerful factor in the campaign against this scourge.

The countries of the region suffer from a lack of quality and efficiency in their educational systems, resulting in high rates of repetition and dropout as well as low achievement in basic learning. This situation leads to great waste in resources and a limit on the potential of educational systems to help improve living conditions. The panorama is particularly critical for the poorest and most marginal populations, among which figure women and indigenous people.

The expansion of access to primary education in most Latin American countries has enabled most children in the region to enter the system. The goal for coming years is to guarantee that children remain in the educational system until they finish at least the basic education cycle to gain the knowledge needed to take part in the development of their countries in conditions of equity. For this goal to be possible, educational policies should be aimed at overcoming the barriers that have traditionally marginalized the learning opportunities of the most vulnerable populations. Educational systems should stimulate activities aimed at improving the inputs and processes within schools, such as those which help to improve the learning capacity of children who enter the system. Especially important among them are those that focus on improving children's nutritional status and development.

At present, because of the deterioration in human development indicators in several countries in the region during the 1980s, governments have made a renewed commitment to social investment. The allocation of resources to the areas of health, nutrition, and education, traditionally considered "social expenditures," is beginning to be defined as an "investment" needed for development, productivity, and competitiveness of the Latin American economic systems in the international panorama. At the same time, the Jomtien Conference on Education for All committed governments to goals of improving educational indicators before the century ends. This lends greater optimism to the future and suggests that policies will be formulated from an intersectoral perspective and will result in improvement in the conditions of the poorest.

II. RELATIONSHIP BETWEEN EDUCATIONAL POLICIES AND NUTRITION

This section examines the effects of education on nutritional levels and how they in turn affect education.

A. Effects of education levels on nutrition

There is ample evidence for a close relationship between level of schooling and human development indicators. These links have been documented intra- and intergenerationally. Among the intergenerational links, research has shown the positive relationship between the educational level of parents, especially of mothers, and the health and nutrition levels of their children. As Levinger notes, it is more probable that a mother with only a few years of schooling provides her children the care and stimulation needed for adequate early development than does a mother who has not had any formal education. One study found that only one year of maternal education is associated with a decrease of 9% in infant mortality. In Africa it is thought that an increase of one percentage point in literacy is associated with two years of increase in life expectancy (Cochrane, cited by Levinger, 1994).

At the same time, in regard to the intragenerational effect, it has been documented how formal education acts as a powerful determinant in several ways. Individuals who have completed primary schooling tend to have higher incomes, more modern attitudes, lower indices of fertility, and better health and nutrition status compared with persons with fewer years of schooling (Levinger, 1994; Lockheed and Verspoor, 1991).

These relationships between education and developmental precursors are especially significant in relation to the schooling of women, as we will see in the section on that subject.

B. Effects of nutrition on education

The points below summarize the conclusions of various studies carried out internationally on the effects of nutritional level on children's learning capacity.

- When children's health and nutrition improves, their learning capacity improves.

Nutrition and health in the early years have marked effects on school performance. A child's ability to learn is closely related to its physical development, aptitudes, and motivation. These characteristics may be limited by malnutrition and poor health in early years. A child's cognitive development, ability to concentrate and attention, and exploratory behavior are matters that affect learning and are negatively affected by poor nutrition. Hunger and fasting are also related to poor school performance. Poor nutrition and health problems during school years increase the negative consequences of early malnutrition (Pollitt, 1984).

Nine studies reviewed by Pollitt report a significant association between nutritional status and results in tests of school performance in China, Guatemala, India, Kenya, Nepal, the Philippines, and Thailand. A study from Kenya showed that well-nourished children had better results in verbal understanding and intelligence than malnourished ones (Pollitt, 1990; Sigman et al., 1989, cited in Lockheed and Verspoor, 1991).

Although the different studies do not show that a malnourished child is incapable of developing the aptitudes needed for school learning, malnutrition is indeed a condition of disadvantage and high risk, especially when it accompanies adverse socioeconomic conditions (Pollitt, 1990).

- Controlling for aptitude, socioeconomic status, school quality, and teacher skill, malnourished children have poorer school performance than non-malnourished children.

A study in the Philippines produced results similar to those noted above on the effects of malnutrition, controlling for family income, school quality, teacher skills, and mental capacity (Lockheed and Verspoor, 1991).

- Hunger interferes with children's concentration and attention. Studies have noted the positive relationship between school feeding programs and school performance.

The study by Sigman et al. in Kenya showed that well-nourished girls were more attentive in class than malnourished ones. Pollitt's study showed that children who were temporarily hungry, usually for lack of breakfast, were more easily distracted in their school work than those who were well fed. An evaluation in Jamaica showed that the provision of breakfast by schools significantly helped improve attendance and achievement in mathematics but not spelling (cited by Lockheed and Verspoor, 1991).

A study in the Antilles examined the effect of fasting on a group of severely malnourished children compared with a group of well nourished children. The malnourished children were more affected by lack of breakfast, as established in tests they were given. This study suggests that in situations in which resources are limited, supplementary feeding programs

should focus on children who present signs of malnutrition (Simeon and Grantham-McGregor, 1989).

- Basically, three micronutrients affect educational achievement: iodine, iron, and vitamin A.

A study in Bolivia of children with endemic goiter noted the positive effect of administering iodine on improvement in mental performance (Bautista et al., 1982, cited in Lockheed and Verspoor, 1991). A study in Indonesia also showed significant differences in the mental and psychomotor abilities of children aged 9 to 12 years related to deficiencies in iodine (Bleichrodt et al., 1980, in Lockheed and Verspoor, 1991). A study in Java demonstrated the relationship between iodine deficiencies and problems of concentration, perception, and skill (Querido et al., 1974, in Lockheed and Verspoor, 1991).

Table 1 summarizes the effects of the principal nutritional deficiencies on school performance.

TABLE 1
Effects of Nutrition on School Performance

Nutritional status	Cause	Effect
Protein deficiency	Deficient diet and poverty	School absenteeism. Lower attendance.
Temporary hunger	Lack of breakfast	Lack of concentration and attention. Poor school performance.
Micronutrient deficiency	Deficient diet	Decrease in mental performance, short attention span, malnutrition-related blindness, slow growth.

Source: McGinn, N., and Borden, A., 1993: 212

Iron deficiencies have been found associated with attention and learning problems (Pollitt, 1980), difficulties in higher cognitive processes (Popkin and Lim-Ybáñez, 1982), and limitations on motivation in persisting in challenging tasks (Pollitt et al., 1989; Lockheed and Verspoor, 1991). At the same time, in India and Indonesia it has been possible to demonstrate that iron supplementation significantly improves cognitive functioning and learning ability in preschool and school children (Seshadri and Gopaldas, 1989; Soemantri, 1989).

Vitamin A deficiency increases the risk of illness, which influences school absenteeism and may lead to ocular changes affecting vision. It may also affect growth, including cerebral development (Lockheed and Verspoor, 1991).

C. Complementarity of education and nutrition

As UNICEF has noted, children's health, education, and nutrition are not hierarchical and should be addressed in an integrated fashion. These areas are interrelated and affect each other. Adequate health conditions at home positively affect health and nutrition, which in turn promote physical and mental capacity for learning, social participation, and obtaining productive jobs that in the end improve family well-being. At the same time, nutritional programs are more effective when they are combined with health care and when intellectual stimulation is provided. The social and economic factors that lead to malnutrition are associated with a child's general health and environment for intellectual development. The broad effects stemming from poverty can only be overcome through a comprehensive approach (UNICEF, 1992).

III. INFORMATION NEEDED TO FORMULATE AND MONITOR NUTRITION POLICIES IN EDUCATION

Given the diversity of the populations and the inequity of resource distribution in Latin America, adequate information systems are essential for focusing and directing resources toward the most vulnerable. During the 1980s, while information systems dealing with economic variables were improved, there was deterioration in systems for gathering, recording, and disseminating sociodemographic information, including health and nutrition. Because of the unequal distribution of income in the region, global economic information is inadequate for evaluating the real status of large parts of the population. In most of the region's countries, the status of sociodemographic information is characterized by the lack of timeliness and variation in quality of data. In most countries there are three sources of information (UNICEF, 1994).

Population and school censuses. These are carried out in the countries every ten years on average and allow reference points to be established to define priority areas in formulating social policy. The development of different statistical models allows the use of data collected in the censuses in establishing databases for follow-up and evaluation systems.

Administrative registries. Such registries have the advantage of being economical since users provide information directly when they use the services, and they are especially useful for gathering information on vital statistics and health, vaccination, and education services. Among the problems of this information collection system is the time required to compile and process information, as well as underreporting and the exclusion of groups who do not use the services.

As may be seen from Table 2, most countries have general information about education and health, but on average it is two years old. Several countries' educational systems lack essential information about enrollment by age and grade, as well as adequate information on the internal efficiency and quality of the educational system.

TABLE 2
Status of Censuses and Administrative Registries
in Latin America and the Caribbean

Country	Population census			Administrative registries				
	1-10 years	>10 years	Data processed	Vital data		Health	Education	Immunization
				Data quality	Lag (years)	Lag (years)		
Argentina		1991	N	C	3	3	3	Y
Bolivia		1992	Y	I	4	..	3	Y
Brazil		1991	N	I	2	1	5	Y
Chile		1992	N	C	1	3	2	Y
Colombia		1993	N	I	2	..	3	Y
Costa Rica		1984		C	1	1	1	Y
Cuba	1981			C	..	1	1	Y
Dom. Rep.		1993	N	I	4	5	3	Y
Ecuador		1990	Y	I	2	1	1	Y
El Salvador		1992	N	I	4	4	4	Y
Guatemala	1981			C	3	..	5	Y
Haiti	1982			I	3	4	3	Y
Honduras		1988	Y	I	5	4	4	Y
Jamaica		1991	..	C	5	2	7	Y
Mexico		1990	Y	I	3	1	1	Y
Nicaragua	1971			I	5	4	1	Y
Panama		1990		I	1	1	1	Y
Paraguay		1992	N	I	1	1	1	Y
Peru		1993	N	I	1	1	3	Y
Trin. & Tob.		1990	..	C	2	2	2	Y
Uruguay		1985	Y	C	1	3	1	Y
Venezuela		1990	Y	C	1	2	1	Y

Source: United Nations, Vital and Population Statistics, Series A, Vol. XLV (taken from UNICEF, 1994)
Notes: C: Almost complete data (at least 90% of events occurred each year)
I: Incomplete data (less than 90% of events occurred each year)
..: Data not available

Surveys. These enable the period collection of socioeconomic and demographic as well as health and education information from samples. Household surveys are especially useful for

analyzing information by social group, poverty level, and women's occupational status, as well as for defining populations or households at risk. Such information serves for preparing poverty maps and focusing social intervention policies and strategies.

There are marked differences in the region in the periodicity of surveys as well as the time needed to process their information. The use of modules dealing with special topics is a common practice in the region. This means that it is quite feasible to include special modules for collecting information about relevant aspects of education, health, and nutrition.

It is important to develop information collection systems to improve the amount and quality of information and to quicken data processing so that decision makers have timely information. Education indicators have focused on enrollment, repetition, and drop-out. Indicators must be extended to cover inputs and processes that affect the quality of education, and to make specific measurements of learning. It is also important to train teachers and supervisors in gathering and using information, and to conduct pilot experiments that demonstrate effectiveness in using information.

To formulate and monitor nutritional policies in the educational area, it is important to have up-to-date information about children's nutritional status, especially of those in vulnerable groups. Educational institutions should collect data in their records about pupil height and weight, as well as their vaccination status. Several countries in the region carry out periodic height censuses in primary schools and others use a "sentinel school" system for epidemiologic surveillance of nutrition and health problems. The height-for-age indicator is of greater importance than weight-for-height in this age group. Data on micronutrient deficiencies can be obtained from sampling systems or clinic or health center records. Such deficiencies are usually prevalent in school populations, which can serve to measure indirectly the prevalence of endemic goiter and iodine deficiency in the general population.

At the school level, teachers or principals can conduct surveys about dietary and hygiene habits in pupils' families and use such information to design training programs for family heads and to incorporate nutritional subjects in the curriculum.

It is also necessary to evaluate the impact of different strategies used in the programs so that the lessons learned from carrying out different interventions can be extracted.

IV. BASIS FOR THE INCORPORATION OF NUTRITIONAL OBJECTIVES IN EDUCATION POLICIES

An attempt is made in this section to provide a broad view of current educational indicators in the region. Emphasis will be placed on those that research has related to human development indices and that are useful in developing policies to improve the health and nutrition conditions of the most vulnerable. Preschool and basic education levels will be included as to access, retention, quality, and financing, as well as matters related to

education for women and bilingual and bicultural education. The section will include policy recommendations for each of these areas.

A. The educational system in Latin America

1. Preschool education

One of the most dynamic phenomena in Latin America is the significant increase in preschool enrollment during the 1980s, when its annual growth rate was 9.1%. The proportion of groups of children between 0 and 5 years entered in preschool increased from 7.8% in 1980 to 14% in 1989. This growth was due to pressure from the increasing number of mothers who entered the labor market during the decade and attempts to reduce the failure observed in primary schools. The greatest increase occurred in groups whose age was close to school entry. Many of the programs serve families and especially mothers and offer community development programs. Most preschool programs provide health, nutrition, and early stimulation services (Reimers, 1992; UNESCO-UNICEF, 1993).

As Table 3 shows, coverage indices are still very low despite the dynamic growth of this educational level. The countries that have the highest preschool enrollment indices are Jamaica, Mexico, Argentina, and Chile. The countries that lag most in preschool education are the poorest and those with the lowest primary education indices in the region: Guatemala, Haiti, Paraguay, Ecuador, El Salvador, and Honduras. The figures on preschool enrollment should be viewed with caution since they do not cover informal programs (Wolff et al., 1993).

The private sector has played a major role in providing preschool education. More than a third of preschool care in Latin America is private, and in the Caribbean almost all preschooling is provided by private institutions, though with a large amount of state subsidization. Preschooling in Latin America is highly concentrated in urban areas, though a few countries such as Venezuela, Mexico, and recently Colombia are making governmental efforts to ensure more equitable distribution of this service (see Table 3).

There is great diversity in the kind of programs provided at this level. They vary from non-formal care in homes to formal educational services. Some programs work with trained mothers in providing child care services, in some instances supported by professional supervisors, while others use instructors specializing in pedagogy (see Box 1).

2. Efficiency of investments in preschool education and nutrition

The study by Wolff et al. identifies four ways in which investment in early education programs increases their rate of economic return (Wolff et al., 1993). They are:

Greater productivity of participating children. Investments to bring about improvements in children's health and nutrition, as well as investments to provide them stimulation and early education opportunities, translate into a high rate of economic return for both the society and individuals. A growing number of studies indicate the link between early

TABLE 3
Preschool Enrollment and Private and Rural Participation
(in percentages)

Country	Gross school attendance rate			Percentage of private enrollment			Rural enrollment as % of total
	1980	1989	change	1980	1989	% change	1989
Argentina	28	39	11	32	31	-1	-
Bolivia	17	16	-1	14	12	-2	32
Brazil	14	27	13	46	37	-9	5
Chile	24	32	8	20	40	20	6
Colombia	10	14	4	64	52	-12	9
Costa Rica	12	22	10	13	23	10	31
Dom. Rep.	5	18	13	87	78	-9	-
Ecuador	6	12	6	42	37	-5	21
El Salvador	10	14	4	20	33	13	12
Guatemala	7	9	3	38	44	6	6
Haiti	2	7	5	-	72	-	-
Honduras	10	11	1	16	18	2	19
Jamaica	72	81	9	85	86	1	-
Mexico	17	40	23	11	7	-4	32
Peru	25	29	4	27	22	-5	14
Panama	11	19	7	34	21	-13	28
Paraguay	5	8	3	63	55	-8	14
Uruguay	26	23	-3	25	44	19	1
Venezuela	32	37	5	17	17	0	15
Weighted average	17	28	11	36	38	2	15

Source: UNESCO-PREALC (cited by Wolff et al., 1993)
Enrollment as percentage of children aged 3-5 years.

education and later skills in regard to educational achievements and adult job finding and experience (Myers, 1992; Lockheed et al., 1980).

Cost savings. Early education as a preventive program helps to improve the efficiency of educational systems and decrease repetition, drop-out, and remedial programs, which cost the countries enormous amounts. At the same time, child-care programs involving family heads

BOX 1
The Colombian Program: Welfare Homes

A very successful, center-based program is the Colombian "Welfare Homes," which consist of non-formal community child-care centers which provide services to children between one and seven years old. They are run by mothers belonging to the community who during the day care for groups of up to 15 children. Since the beginning of 1986 the program has expanded until it covered approximately 800,000 children in 1991. Generally speaking, children are cared for eight hours a day in the home of the day-care mother. Care consists of providing children the conditions necessary for stimulating their health and physical, psychological, and social development. Each of the mothers from the community who acts as a "day-care mother" in the system receives training in child care and development, family and community relations, and nutrition and health. Mothers whose children are cared for in the day-care mother's home take turns assisting her. Nutritional supplements are provided to the children. Mothers in the non-formal child-care system receive small loans to improve their homes' conditions. Community members take part in an initial analysis of community service needs, determine the number of day-care homes to be established in their community, and choose the local women who will become mothers responsible for care. Local management teams are organized who are responsible for purchasing and paying the community mothers. Some children are given "scholarships" which are used to pay the day-care mother. A large part of the financing, as well as coordination of the programs, comes from the Colombian Family Welfare Institute (ICBF), and additional responsibilities are shared with the Ministry of Public Health, the National Training Service, the Housing Credit Institute, and other governmental and private organizations. While it directly meets children's care and development needs, the program also attempts to improve a community's economic base by providing it paid work in the neighborhoods that care for children and enabling other women to seek jobs (or improve those they have) and channeling funds to local businesses for economic activities related to day care.

Source: L. Wolff et al., 1993:40

or care givers offer the possibility of promoting healthy eating practices in them which will benefit their entire families and last beyond the preschool period.

In a study on the relationship between preschool education and repetition in 18 Latin American countries, a high correlation was found between having attended preschool and a decrease in repetition in the first grade. Jamaica, for example, has the highest proportion of preschool education and the lowest repetition rate (Wolff et al., 1993).

Greater productivity possibilities for those caring for children. Child-care and early education programs give mothers and others responsible for children more time to be able to

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take part in the labor market and productive activities. They also free older siblings so that they can devote themselves to studying.

Less inequality. Investment in early childhood development programs helps decrease the gap between different social groups. There is widespread evidence that children belonging to the lowest socioeconomic levels benefit more from this kind of program than children of higher levels. In the most disadvantaged sectors, these programs offset the limitations on development and learning opportunities in their families. Non-formal programs in which mothers and other people from the same community who have received training and have professional supervision take part cost less than formal programs and may be very successful (see Box 1).

Opportunity for promoting healthy food habits. Even though eating habits are largely acquired in the first years at home, the preschool and school years offer an excellent opportunity for developing positive eating and health habits and for changing negative habits and developing new habits for adult life which will be transmitted to later generations.

Primary education

a. Access

Latin American countries have significantly expanded their populations' access to the educational system. Of 10-year-olds, 92.3% have been in primary school at some time in their lives. The proportion is more than 95% in most of the countries, and in only five (El Salvador, Guatemala, Nicaragua, the Dominican Republic, and Haiti) is access below 80%. This means that, despite financial constraints, access to primary school in Latin America tends to be universal except in the poorest countries, in certain rural areas, and in some populations, particularly indigenous groups.

b. Retention, repetition, and drop-out

As has been noted by Wolff et al., eight in every 10 students spend at least seven years in primary school. Large-scale drop-out begins at 13 years and intensifies at 14. Temporary drop-out is a fairly widespread phenomenon in the region and is closely linked to repetition.

Repetition, a problem of greater importance than drop-out and in good part its cause, is quite a sizeable problem in the region. Although the average student spends 6.8 years in the educational system, he completes only 4.2 grades. Only 47.2% complete the six grades of primary school, and of them 56% do so after repeating three or more times. It takes an average of 15.5 years for a student to graduate from primary school and an average of 1.7 years for a student to move from one grade to the next. This means that, on average, a student in Latin America remains in the same grade for 1.7 years before moving to the next grade; in other words, 70% of students require an extra year to complete a grade.

This long period could be an indicator of school flexibility in allowing slow-learning students to reach the knowledge and skill levels needed to pass from one grade to the next. Nevertheless, as some recent studies have noted, the frontal system contributes little to this differentiated learning process and instead means a loss of time for the student, who does not necessarily learn more by repeating. In this vein, as Wolff and others have noted, the high repetition rate may be interpreted as an indicator of the low quality of the school system and a limitation on expansion of access and achievement of more schooling. The problem of school failure cannot be attributed entirely to the procedures and inputs that occur in schools, however. Against this background, as Levinger notes, the learning conditions which students bring with them on entering school have a decisive weight on their possibilities for making use of the opportunities the school system offers them. The poor health and nutrition status of pupils are serious barriers to learning.

The repetition problem is especially significant in the first grade, where the region's average rate is about 41.4%. Repetition is greater among students from families of small means. It is thought that students in the poorest quintile repeat twice as much as those in higher quintiles, which means that students from poor families have repetition rates close to or higher than 60%. Since malnutrition and poverty are closely correlated, it might be thought that activities aimed at improving the nutritional status of the poorest will have positive effects on educational indicators as well.

Of the nine million six- and seven-year-olds who enter primary school, approximately four million fail at least once. This means that Latin America spends about US\$2.5 billion a year on teaching 20 million repeaters. Although the repetition rate fell by approximately 8 percentage points during the 1980s (Wolff et al., 1993), if policies in this regard are not changed and the problem of school failure is not confronted from a comprehensive perspective which takes into account the conditions of school matriculants, repetition will continue to be one of the educational system's major problems in coming years.

c. Quality

As noted above, the extent of repetition in the region is an indirect indicator of low educational quality in Latin America. Children repeat because they do not learn, but their learning is not improved by repeating. The factors that lead to children not learning include those related to poor teaching quality and lack of learning materials, combined with conditions that decrease children's learning capacity. Among the latter are poor health and nutrition status.

Comparative studies conducted in some Latin American countries (International Assessment of Educational Progress, or IAEP, and the Third International Mathematics and Science Study, or TIMSS) show that, in terms of school performance, the region's countries have significantly lower scores than those in the developed world and those in Asian countries. The English-speaking Caribbean countries have better results than other countries in the region.

Inequality in the distribution of knowledge also occurs within the countries. The difference in school performance is significant between regions and is lower in disadvantaged populations (rural areas, indigenous groups, and marginal urban groups). Elite private schools have higher scores than public schools, but private schools serving disadvantaged groups produce results only slightly higher than those of public schools, and in some instances below them (Wolff et al., 1993).

d. Financing

Public spending on education as a proportion of GDP is similar in Latin America and recently industrialized countries. Nevertheless, the proportion of that spending allocated to primary education varies considerably. While Latin American countries allot an average of 1.1% of GDP to primary education, this proportion is 1.5% in recently industrialized and 1.8 in developed countries.

During the 1980s, primary education in the region underwent significant regression. Except for Chile and Haiti, the average investment per pupil at this level fell by approximately 28%. Likewise, the real salaries of primary teachers decreased by an average of 34.8% (see Table 4).

e. Primary education, gender, and nutrition

Aside from socioeconomic level, the most important predictor of children's health, nutrition, and mortality is the extent of the mother's formal education. Recent studies suggest that maternal education has a positive effect on child health, nutrition, and the decrease in child mortality which is largely independent of other socioeconomic factors (Barrera, 1990; Thomas et al., 1990, cited by Mora and Wickham, 1994).

Educated mothers have smaller families, a smaller number of their children die during childhood, and those who survive have better health and education. Mothers with more years of education enter the labor market with better wages, a very important factor for countries with a large number of households headed by women. It should thus not be surprising that countries that have had higher levels of female education have more productivity and less child mortality, a greater life expectancy in their population, and less maternal mortality, as well as lower fertility rates (see Table 5).

TABLE 4
Unit pupil cost and annual teacher salaries. Primary education.
(Variation from 1980-1989)

Country	Unit pupil cost			Estimated annual salary per teacher (US\$ 1990)		
	1980	1980	Variation	1980	1989	% of variation
Argentina	164	142	-22	3,116	2,563	-17.7
Bolivia	136	73	-63	2,584	1,734	-32.9
Brazil	214	200	-14	5,286	4,561	-13.7
Chile	151	203	52	3,731	5,014	-34.4
Colombia	76	62	-14	2,238	1,767	-21.0
Costa Rica	236	175	-61	6,278	4,489	-28.0
Dom. Rep.	64	25	-39	2,432	974	-60.0
Ecuador	173	97	-76	5,917	2,672	-54.8
El Salvador	175	63	-112	7,981	2,514	-68.4
Guatemala	48	35	-13	1,551	1,164	-24.9
Haiti	29	35	6	1,212	1,264	4.3
Honduras	115	115	0	4,042	3,933	-2.7
Jamaica	145	127	-18	5,648	3,499	-38.0
Mexico	221	114	-107	8,188	3,466	-57.7
Panama	271	237	-34	6,951	5,404	-22.3
Paraguay	68	50	-18	1,744	998	-42.8
Peru	41	23	-18	1,441	634	-56.0
Uruguay	566	256	-310	11,829	5,351	-54.8
Venezuela	277	213	-64	5,823	4,047	-30.5
Average	164	118	-46	4,986	3,251	-34.8

Source: World Bank, cited by Wolff et al., 1993.

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TABLE 5
Maternal schooling, infant mortality, and fertility rate

Country	Years of schooling					Infant mortality	Fertility rate
	0	1-3	4-6	7-9	> 10		
Bolivia	17.4	21.6	19.9	15.4	25.7	102	4.5
Brazil	7.4	22.3	31.6	16.0	22.6	60	2.7
Colombia	6.9	23.9	31.3	21.0	16.8	39	2.6
Dom. Rep.	5.9	20.9	24.7	21.0	27.6	61	3.3
Ecuador	7.8	14.8	32.7	16.1	28.6	60	3.6
El Salvador	21.3	24.6	24.6	13.4	16.0	59	4.0
Guatemala	41.7	24.1	19.6	6.2	8.4	54	5.3
Mexico	11.6	16.6	31.4	26.4	14.0	40	3.1
Peru	10.9	17.8	24.3	17.0	29.9	82	3.5

Source: Castro and Juárez, 1994; UNICEF, 1995.

Castro and Juárez (1994) analyze three kinds of results from education and its effects on women's reproductive behavior:

Education as a "source" of knowledge: By imparting skills in reading and writing, education enables pupils to process large amounts of information while stimulating cognitive changes which affect behavior. The direct effects of knowledge on nutrition are not clearly documented, but it is to be hoped that they provide tools and facilitate the introduction of new and better eating and hygiene habits.

Education as a "vehicle" for socioeconomic progress: Education opens up economic opportunities and makes social mobility possible. In most societies, educational credentials are criteria for finding jobs and establishing job rankings. In Latin America, however, there are communities in which job structure is determined by a rigid stratification by sex which limits promotion possibilities and access to paid work by women.

Education as a transformer of attitudes: Exposure to new ideas and models of behavior may lead to significant changes in expectations and questioning of traditional beliefs and structures of authority.

f. *Educational status of women in Latin America: access, schooling, and illiteracy*

Taking into account the influence of women's education on poverty and human development indicators, and the importance of education for personal development, it is important to highlight the challenges which Latin America has still to face in this area because of the conditions of gender inequality that persist in the region.

In most Latin American countries, women have access to basic education similar to that of men, and in several countries female enrollment even exceeds that of men. Nevertheless, illiteracy indices for women exceed those of men, and female years of schooling are less than male years. For all Latin American countries for which data are available, excepting Jamaica, Costa Rica, and Venezuela, the illiteracy index for women is greater. Although the countries have made significant progress in this regard, focusing efforts on the female and especially the indigenous population continues to be a priority (see Table 6).

Countries with large indigenous populations are those that have lower female enrollment and higher drop-out. Thus, for example, the census conducted in Peru in 1991 showed that men older than 45 years have an average of 4.2 years of schooling while women of the same age have an average of only 3. Efforts made in this vein in recent years have been lessening the difference, and in the population aged 15-19 years male schooling has increased to 6.3 years and that of women to 5.7 years. Nevertheless, differences in opportunities for attending school among the indigenous and rural populations, especially in the highlands, are reflected in illiteracy indicators of 10.5% among women aged 15-19 years, compared with illiteracy of only 1.7% in the male population of the same age (World Bank, 1994). In Guatemala the illiteracy index in the female indigenous population older than 10 years is 81.2%, compared with 23.6% among non-indigenous men (World Bank, 1995).

g. *Basic education for indigenous groups*

Ten percent of the school population in Latin America belongs to ethnic groups whose languages are not Spanish. This population is significantly larger in some countries such as Bolivia, Peru, Paraguay, Ecuador, Guatemala, and Mexico. Because of the cultural and communication problems affecting the performance of such students, it is not surprising that the repetition and drop-out rates of this group of children are among the highest in the region.

Guatemala illustrates the challenges facing the educational systems in guaranteeing equity in access and learning opportunities to indigenous populations (see Box 2). Close to half of Guatemala's population is indigenous, but there is an enormous discrepancy in access and learning opportunities between that country's indigenous and mestizo populations. Inequality is also significant between men and women. These low educational indicators in the economically active population have limited the economic growth goals set by the government. Analyses made in Guatemala of the rates of educational performance indicate

TABLE 6
Illiteracy and Primary Education Enrollment by Sex

Country	Illiteracy rate 1990 (%)			Gross primary school matriculation rate 1990 (%)		
	Total	Male	Female	Total	Male	Female
Argentina	4.7	4.5	4.9	111	108	115
Bolivia	22.5	15.3	29.3	85	89	81
Brazil	18.9	17.5	20.2	-	-	-
Chile	6.6	6.5	6.8	98	99	97
Colombia	13.3	12.5	14.1	111	110	112
Costa Rica	7.2	7.4	6.9	101	102	100
Cuba	6.0	5.0	7.0	100	102	99
Dom. Rep.	16.7	15.2	18.2	95	95	96
Ecuador	12.7	9.6	16.1	118	119	117
El Salvador	27.0	23.8	30.0	79	78	79
Guatemala	44.9	36.9	52.9	79	84	74
Guyana	3.6	2.5	4.6	112	113	111
Haiti	47.0	40.9	52.6	56	58	54
Honduras	26.9	24.5	29.4	104	102	107
Jamaica	1.6	1.8	1.4	106	105	108
Mexico	12.4	9.6	15	115	116	113
Panama	11.2	10.6	11.7	107	109	105
Paraguay	9.9	7.9	11.9	108	109	106
Peru	14.9	8.5	21.3	126	-	-
Suriname	5.1	4.9	5.3	127	129	125
Uruguay	3.8	3.4	4.1	108	109	107
Venezuela	11.9	13.3	10.4	97	95	98

Source: World Report on Education. UNESCO, 1993

that they are 13.2% for indigenous women and girls, while for men they are 11.0% (World Bank, 1995). To provide this population better opportunities, bilingual and bicultural education should be implemented in schools that do not require it, and teachers speaking native languages should be assigned to such schools. It will also be important to make efforts to produce books and texts in native languages. The need to conduct campaigns that promote respect for cultural diversity and the need to preserve it, as well as the importance

of making children belonging to ethnic groups literate in their own languages, must be borne in mind.

Box 2

PRONEBI, GUATEMALA'S NATIONAL BILINGUAL EDUCATION PROGRAM

In 1979, Guatemala established a bilingual education program with government and USAID support to improve the quality of education for the indigenous population. The national curriculum was adapted and translated into four Mayan languages from preschool through the fourth grade. In 1991, 96,104 indigenous children between five and six years old entered PRONEBI schools. This group represents 14.7% of the population of indigenous children in that age group. Culturally relevant instruction is provided in these schools in Spanish and the indigenous language. The program operates in 400 schools with the complete curriculum and in another 400 preschools. It will eventually be adapted to other Mayan languages to cover other indigenous populations. Bilingual education has increased at an annual rate of 7% since 1986 thanks to this program. A challenge facing PRONEBI has been to recruit enough bilingual teachers. Analyses and evaluations of the program show a significant improvement in educational indicators. Repetition, drop-out, and promotion indices have improved. Fluency in Spanish is better in PRONEBI than in non-PRONEBI schools, and in seven of eight measurements of academic performance students in the program made more progress than those in control groups. It is believed that this improvement in indicators has saved the educational system more than 32 million quetzals.

Source: World Bank Series, January 20, 1995

B. Current trends in educational policy

Primary education is the nucleus of basic education. It enables meeting basic learning needs, forming a basis for children continuing to learn, and creating a demand for continuing education. The rate of social performance from education exceeds that from other investments. No country has managed to develop itself and improve the living standards of its citizens without having first achieved universal basic education for the school-age population. Analyses of the conditions that enabled the countries of East Asia to develop themselves so rapidly agree on the high level of human resources such countries had. By 1960 they had succeeded in universalizing primary education and had created broad access to secondary education (Crouch et al., 1992; World Bank, 1993).

The World Conference on "Education for All" established universal access to quality basic education as a goal. To accomplish this, intermediate goals have been established for implementation before the end of the century. Among them are:

- Increasing to more than 50% the index of children completing primary school;
- Reducing repetition in the first two grades by 10%;
- Ensuring that on finishing their fourth year of schooling, 60% of children are able to read with understanding, able to communicate in writing, know how to calculate and solve problems, and have life knowledge and skills;
- Increasing the coverage of non-formal early child development programs by 5% and supplementing them by improving the knowledge of parents and care-givers of child development; and
- Increasing the coverage of primary education in countries with low access levels by 5%.

There are favorable conditions in Latin America for fulfilling the goals proposed (UNICEF, 1994). Among them are:

- The recent reforms in educational legislation in several of the region's countries which create possibilities for participation and commitment.
- The lessons learned from various studies that shed light on strategies for bringing about improvement in the quality of education.
- The granting of loans by the World Bank, which has increased its resources for financing primary education. They have increased from US\$20 million per year in the period 1985-1990 to a planned annual amount of US\$500 million in 1991-1995.
- Prospects for continuing and accelerating improvements in the nutritional status of children in their early years of life, as a result of which favorable conditions will be created for children to take advantage of preschool and primary education.
- The current commitment of the Ministries of Education to curricular reform, inclusion of schools in food security programs, and improvement of teaching materials, such as the Central American Agreement on Education and Culture.
- The "healthy schools" movement is gaining momentum and represents an example of motivation for change and the active participation of schools in health promotion.

- Currently, processes of decentralization and "municipalization" are underway in many countries which stimulate and encourage popular participation in the definition and implementation of social programs, including those in education, health and nutrition.
- The growing participation of non-governmental organizations (NGOs) and other grass-roots organizations in the development of social programs, among them education, health and nutrition.
- The greater priority that most governments are assigning to the social sector, and the creation of "Social Investment Funds" that facilitate the preparation of plans and social development programs in the fields of education, health and nutrition.

V. CONCLUSIONS

1. Although the countries of Latin America have made great process in the areas of health and education, large segments of the population still remain on the margin of development. It is essential to develop policies and focus resources on such populations, among which are indigenous groups, women, peasants, and marginal urban residents.
2. Access to basic education is almost universal in Latin America, but children tend not to stay in the system, and what they learn is minimal. In addition to the existence of serious problems in the quality of the education offered in the region's educational establishments, many children enter the system with limited learning capacity because of nutrition and development problems.
3. The educational system can contribute to the improvement of health and nutrition through specific actions, both educational and the delivery of services such as school health, feeding and nutrition programs, the development of school gardens, etc.
4. Programs to care for children of preschool age are particularly suitable and effective for conducting integrated interventions with the participation of parents. The region has several models of successful preschool and basic education programs. The countries can benefit from their lessons and can adapt them to their own conditions.
5. The commitments that most of the countries' governments have made at summits of chiefs of state and the conference on Education for All, and the increase in credits made by international agencies for investment in basic education, create particularly favorable conditions for the countries to fulfill the health and education goals that have been proposed for coming years.

VI. POLICY RECOMMENDATIONS

A. General recommendations

The general recommendations refer to the educational system in general. These policies should be closely coordinated with related policies in the health and agriculture sectors. Nutrition in health policies are especially important due to their significant impact on the quality of the "raw material" which enters the educational system, in terms of children's level of growth and development and their learning capacity. The educational system, in turn, should focus on improving the quality and coverage of education at all levels, especially preschool and primary school, through provision of the necessary resources to develop and fully exploit students' learning capacity and the potential influence on the family and the community.

The following priority areas of educational policy are recommended, based on their great potential for nutritional impact and for human capital development:

1. Integrated policies. Given the interrelationship between learning ability and children's nutritional and health status, as well as the link between a population's number of years of schooling and its indicators of morbidity and mortality, governments should develop comprehensive and intersectoral policies to improve health and education conditions in the region.
2. Access of marginal populations to the educational system. One of the basic policy directions is to guarantee the right to basic education for the entire population, with emphasis on traditionally marginalized groups: women, indigenous populations and the very poor. Indigenous groups may be the most vulnerable in Latin America. It is essential to conduct education and health activities that offset the effects of malnutrition and poverty. To overcome the barriers that have traditionally marginalized such groups, governments should make special efforts to promote bilingual education programs by training bilingual teachers and preparing textbooks in native languages. Nutritional supplement programs should also cover such groups.
3. Institutionalization of school feeding and nutrition programs in education legislation. The primary objective is to improve rates of enrollment, attendance, retention, learning capacity and school performance, as well as the formation of healthy lifestyles and eating habits in school children, as part of the development of a "health culture" which would potentially influence the family and the community.
4. Optimize the role of the educational system in the promotion of social change, especially stimulating social mobilization and community participation, such as, for example, the "healthy schools" and "health communities" initiatives.

5. Incorporation of educational contents on health, food and nutrition in primary and secondary school curricula. Specifically, the educational system can establish policies which directly help to achieve nutritional objectives, such as the following:

- Developing a curriculum that includes instruction in nutrition and health to promote healthier dietary and hygiene practices.
- Training teachers in health and nutrition and giving them instruction about how to identify symptoms of malnutrition in their pupils. Since the effects of malnutrition in school-age children are manifested more by slow growth than a relationship between low weight and height, it is important to perform measurements of height based on age to identify children at risk and focus interventions on them. Health and nutrition interventions should be sustained and continuous for their positive effects to last.
- Preparing appropriate educational materials for the primary and secondary levels (e.g., textbooks, dietary guidelines, audio-visual materials), as well as the inclusion of practical examples of health and nutrition information in other subjects (mathematics, natural sciences, etc.).
- Conducting micronutrient supplement distribution, school snack, and periodic deworming programs to increase children's learning capacities. Such interventions can be made at relatively low cost and should be focused on groups in which poverty and malnutrition prevail.
- Giving priority to women's education, which is that most consistently related to indicators of child morbidity and mortality. Although women in Latin America have a higher educational level than in other developing countries, the data available conceal major differences by region. The countries still face the challenge of increasing their rate of continuation in the educational system and reducing the high rates of female illiteracy. Activities such as promoting more women teachers in rural, indigenous, and marginal areas, designing textbooks without sexist stereotypes, and sensitizing parents and teachers to women's equality in learning ability can help improve girls' participation and continuation in formal education.

6. Incorporation of educational contents on health, diet and nutrition in non-formal and long distance education activities. Non-formal education offers a special opportunity for transmitting knowledge and educating the population on practical aspects of health, diet and nutrition and can contribute to the development of healthy lifestyles and eating habits.

7. Incorporation of nutritional concerns in education policy. The welfare of school-age children and the relationship between basic health and education needs has been a concern of several Education and Health Ministries in Latin America. One of the main interests has been analyzing the impact of health and nutrition problems on children's access to and participation in the school system. The objective of these analyses has been to identify and

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promote interventions in schools and communities that meet the specific health and nutrition needs of the population.

Health care programs conducted in schools have the great advantage of reaching a very large proportion of the population and of enabling an intervention to be documented and followed up. Among the school programs which have been successful in several countries are vaccination, food supplementation for populations at highest risk of malnutrition, and inclusion of nutrition information in the curriculum with emphasis on the importance of a balanced diet. Other important activities have been training teachers in basic nutrition and health to identify students at risk of malnutrition and determine when they should be referred for special treatment. At the same time, nutritional supplements can be focused through school services and micronutrients included for populations requiring them. Such measures have been shown to be more effective when they are applied in an integrated way and not singly.

Lockheed and Verspoor (1991) have classified school programs aimed at alleviating health and nutrition problems as "promising ones" and those they call "dead ends."

Among the school-based interventions offering promise for improving health and nutrition, they note the following:

- **Providing nutritious supplements or snacks in schools to alleviate protein-deficiency malnutrition and temporary hunger, as well as provide micronutrient supplements and de-worming treatments. Such treatment is considered cost-effective since it produces large benefits and attacks serious but reversible learning problems. Some programs that have been successful include school food programs that provide fortified biscuits with micronutrients such as those carried out in Central America.**
- **Identifying hearing and vision problems through simple examinations may help teachers take appropriate measures to reduce the disadvantage that students with such problems face.**

Among the "dead ends" are:

- **Providing school lunches instead of breakfasts or snacks. Such lunches are rarely designed to supplement nutritional deficiencies, and their effect is more on school attendance and as a mechanism for transferring income to the poorest populations. Evaluations performed to measure the nutritional effect of these programs have not found positive nutritional results. It is possible that this is because of the low number of class days annually, of the replacement that families who delegate feeding to schools make, or of ineffectiveness in focusing the program on the neediest. Given the high cost of this program and logistical needs in infrastructure and staff, this intervention is not considered promising for meeting the nutritional needs of the school population. It should be noted, however, that since the school period is one of**

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slow growth, it is difficult to demonstrate changes in the conventional nutritional indicators associated with school nutrition programs. In contrast, the effectiveness of this kind of program in improving school attendance and academic performance has been convincingly demonstrated.

B. Specific recommendations

1. For preschool or initial education

■ Targeting

Public expenditures on initial education should be aimed at children of the lowest socioeconomic levels. Families of the middle and upper levels should meet the costs of initial education for their children themselves.

■ Coordination of efforts

Initial education programs should seek intersectoral solutions coordinated between government, the community, and non-governmental organizations with regard to providing services.

■ Successful, low-cost experiences should be the basis

Governments should avoid programs that reproduce the characteristics of primary schools and are of high cost. The region has examples of successful programs, such as Colombia's community homes and the program to train parents in their homes in Mexico.

■ Inclusion of nutrition and child development subject matter in the training of teachers

Teacher training programs should include child development, nutrition, and education in their curricula. Students in primary schools should receive information through the curriculum about health, nutrition, and child development which will influence their later lives as parents or when they become responsible for young children. The same topics can be included in literacy and adult education programs.

2. To improve access and quality of basic education

The following policies are recommended to bring about universal access to quality basic education:

- Concentrate resources and efforts on the early grades and in basic areas.**

- Improve teaching practices that promote active education centered on children.
- Increase and improve the use of educational inputs, especially textbooks and materials.
- Increase the time devoted to learning.
- Improve children's learning capacity by promoting formal and non-formal comprehensive care programs for the school-age population that develop physical, nutritional, intellectual, and socioaffective aspects.
- Promote programs that are flexible in both schedules and curricula and which match local conditions.
- Offer bilingual education to populations whose native language is not Spanish.
- Improve teacher training.
- Organize local planning and monitoring mechanisms.
- Promote social mobilization, community organization, and increased demand.
- Target programs and resources on the most vulnerable populations.

Some successful experiences in the region stress the objectives noted here and have served as models in several countries (see Box 3).

BOX 3

SUCCESSFUL EXPERIENCES IN BASIC EDUCATION IN LATIN AMERICA

Latin America is a young region which is learning. Its goal for the 1990s is to guarantee basic education for all. But this is not simply a matter of quantity but, more than anything else, of achieving quality and efficiency. Let teaching adjust itself to the needs of a society that must develop to the maximum the quality of its human resources, the chief source of a country's wealth.

The region has a few positive experiences which have attempted to construct models of comprehensive, active, decentralized, innovative, and genuinely useful education to meet its needs.

One of the most significant steps taken to raise the level of basic education is Colombia's New School program. This experiment, which began in 1975 and addresses the needs of multigrade rural schools, integrates a school with its community to make education more efficient and relevant and better adapted to the rural environment. This is a systemic model that developed strategies for curricula, teacher training, administration, and relations between the school and community. Among its principles are active education, teacher as facilitator, the use of self-teaching guides, work in small groups, modular and flexible evaluation, establishment of student government, and emphasis on the social and emotional development of students and community participation.

Taken from UNICEF, 1992; Wolff, L., et al., 1993; World Bank Document, 1995.

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