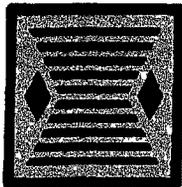


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**HOUSEHOLD LEVEL INDICATORS OF BROAD-BASED ECONOMIC
GROWTH AND DEVELOPMENT: A FRAMEWORK FOR SELECTION AND USE
IN LATIN AMERICA AND THE CARIBBEAN**

Prepared by the LAC Health and Nutrition Sustainability Contract
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August, 1992

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Executive Summary

Economic growth has commonly been viewed as the primary means of improving the quality of life and reducing poverty in developing countries. Thus, rapid growth has been advocated and pursued by national governments and international organizations as the main instrument for achieving social progress. At the same time, the relationship between levels of poverty, welfare and economic growth has been widely studied by economists and other social scientists. Growth is acknowledged to be a necessary precondition for the reduction of poverty, yet by no means does it guarantee that poverty will be eliminated for all population groups.

Efforts to understand and monitor the manner in which the benefits of economic growth are distributed throughout the economy and ultimately effect welfare at the individual level have been hindered by the lack of simple, valid, and easily collected indicators of health and well-being. The need for appropriate food consumption and nutrition indicators has currently become more pressing in order to track and ameliorate the potentially negative impact of ongoing economic adjustment policies on poor and disadvantaged groups. With the purpose of establishing instruments and a mechanism by which to quantify and monitor the welfare impacts of development strategies emphasizing economic growth, A I D /LAC Bureau requested the LAC Health and Nutrition Sustainability (LAC HNS) contract to conduct a study to propose a set of simple indicators that can be routinely used by USAID mission staff to accurately track welfare changes in the region. Selected welfare indicators offer advantages to tracking the distribution effects of economic growth policies and of other key programs and projects assisted by LAC missions. The study team developed a conceptual framework to understand the

relationship of economic growth (and policies/programs promoting economic growth) to household and individual welfare. The model describes the linkages between economic policies/projects and household resources, as well as the relationship between household resources and welfare. An analysis of the economic and health/nutrition dimensions and indicators of household and individual welfare leads to the selection of a small number of simple, valid, sensitive, easy to collect and interpret, economic and nutrition/health indicators of household welfare. The indicators recommended include (1) **food ratio** and its components-- (2) **total expenditures** and (3) **food expenditures**, (4) **proportion of children attending primary school**, (5) **weight-for-age** and (6) **height-for-age** of infants and preschool children, (7) **height-for-age of primary school entrants**, and (8,9) **infant and child mortality**.

These indicators track the differential impacts of programs and policies at the key welfare juncture--the individual and the household level. They are sensitive to changes in welfare over time, among different segments of the population, and were selected because they are specific to changes in welfare. These indicators are comparable across countries and understandable to decision-makers in a variety of contexts. Although the use of these indicators will require some increases in resources for data collection, they are linked to current types of performance and intermediate indicators that may already be in use in LAC missions. The recommended indicators were selected on the basis of knowledge on the transmission of growth through the economy and the linkages between welfare and programs/policies for diversification of agriculture, private sector development and natural resources/forestry. The relevant research on these linkages is described and examples of variables and indicators for monitoring performance, indirect effects and welfare effects are provided.

Data acquisition strategies to be used by Missions to collect information on the recommended indicators will be contingent upon existing and potential data sources and their properties, as well as upon a number of critical issues related to specific questions to be answered, data collection costs, time constraints and frequency needs, and expected changes in welfare indicators. Specific steps to be taken by Missions interested in field testing and using the recommended indicators include (1) an inventory of existing and potential data sources and analysis capability in the country, (2) discussions about options for strengthening and making additions to existing information systems, and (3) preparation of a workplan for field testing and use of the indicators to track welfare changes over time in the general population or in well defined segments of it. Missions may want to make use of sources of technical assistance in this regard, i.e. LAC HNS and the Food and Nutrition Monitoring Project (FNMP).

Finally, some recommendations are made in the report for research required both on the proposed and alternative (proxy) indicators and their ability to track welfare changes and on operational issues related to goal definition, objective specification and assembling of impact oriented data bases. Again, a number of sources of technical support to Missions are available.

I. INTRODUCTION

The Latin America and Caribbean (LAC) Bureau of A I D recently developed a programmatic framework for the accomplishment of broad-based economic development with the assurance of social equity in A I D -assisted countries. As A I D-supported policies and programs are instituted, their impacts affect different sectors of the economy and different segments of society. These changes are translated into aggregate outcomes, but without knowing the composition of the aggregate, it becomes impossible to determine who benefits and who does not. The composition of aggregate changes varies greatly depending on the nature of the policy and the structure of the economy. Due to the complexities in socioeconomic structures, it is often difficult to accurately establish a direct causality between macro-economic performance and changes in welfare at the individual and household levels. Furthermore, the quantification of the relationship between aggregate economic growth and the health and well-being of families has been limited by a lack of simple, valid, collectable indicators of key dimensions of individual well-being. National-level indicators of economic performance that are currently collected only measure aggregate changes and, thus, do not capture the distribution dimensions of the LAC Bureau's development goals and alone may be inappropriate for monitoring LAC performance.

A I D 's Bureau for Latin America and the Caribbean (LAC) has recognized the need to develop welfare indicators that go beyond simply monitoring per capita national data on economic growth, income, and employment, and are sensitive enough to assess the impact of government policies and foreign assistance on the social conditions of the poor at the household and individual level. Because it is well recognized that the health and nutritional status of

children is highly correlated with socioeconomic development, the LAC Bureau requested the LAC Health and Nutrition Sustainability contract to identify simple indicators that help quantify and monitor the health and food/nutrition-related welfare impacts of development strategies that emphasize economic growth on the quality of life of poor and disadvantaged populations

A study team of two nutritional epidemiologists and three economists reviewed A I D 's current policy and strategy documents regarding overall economic goals in order to assess the relevance of several indicators in facilitating improved targeting, reporting/monitoring and program planning and evaluation. The study team developed a conceptual and analytical framework for the relationship between economic growth and household welfare, with emphasis on food security. The results of studies showing the impact of economic growth and linkages between economic policies and the poor, specifically in the LAC region, were reviewed, as well as those on the economic and health/nutrition dimensions and indicators of household welfare. It was found that general income and employment indicators alone may not be valid to measure changes in well-being at the household and individual levels, but should be considered in concert with disaggregable indicators of welfare.

The report examines the relationship between stated goals of broad-based economic growth and the selection of indicators that capture the distribution of the benefits of growth. Information is provided about how policies and programs interact to affect welfare outcomes. From this analysis, a set of readily understood and relatively easily collected indicators are recommended, which are also consistent with monitoring A I D /LAC Bureau objectives in the

context of policy and program interventions. The recommended set of simple indicators can be used to monitor trends at the national level as well as at the program/project level¹

The report is organized as follows. First, the goals and objectives of the A I D /LAC Bureau and Missions, and the types of policies and programs in the current portfolio are summarized along with a brief discussion of basic issues in the assessment of changes in household welfare as related to such policies and projects. Second, a conceptual framework is presented that describes the links between economic growth (also effective policies/projects to promote it) and welfare, and the most important dimensions of household well-being that should be considered in the identification of indicators. The third part of the report depicts the criteria used for the selection of household food and nutrition-related well-being indicators and recommends a set of specific economic and nutrition/health indicators. Much of the literature synthesis regarding specific A I D projects and policies is relegated to appendix A. Fourth, after a review of key features of basic data sources and their implications for data collection and analysis, some strategies for data collection are suggested that A I D missions may consider to gather the information needed to estimate the proposed indicators. Finally, the most relevant research needs with regard to the proposed indicators and A I D /LAC operational needs are identified.

¹ The recommended indicators were selected specifically for tracking changes in household welfare over time, rather than to identify households or individuals at risk for targeting or other purposes. Although in some cases an indicator may be useful for both purposes, screening indicators of risk (i.e. demographic, geographic, socioeconomic) are not always likely to change over time, e.g. as a result of changes in welfare.

II. ASSESSMENT OF CHANGES IN HOUSEHOLD WELFARE AS RELATED TO A.I.D./LAC BUREAU AND MISSION GOALS, POLICIES AND PROJECTS

A. A.I.D /LAC GOALS, POLICIES AND PROJECTS

LAC Bureau goals fall into two broadly defined categories economic and political goals Mission goals, as outlined in CDSS papers and Action Plans, tend to closely parallel the Bureau goals Since political objectives are best measured by political indicators, they are not described here The following is a general outline of A I D goals and how they are transmitted through policy and project activities in the LAC region A more detailed discussion of the Bureau and Mission goals and priority concerns and their record in effecting broad-based growth is contained in Appendix A

1. Goals

1.1 Support broadly-based, sustainable economic growth Policies designed to promote employment creation, investment, and export-led diversification are encouraged, with efforts to increase the participation of the private sector Also, in order to ensure that the benefits of growth are shared by broad segments of the population, accelerated economic opportunities for historically disadvantaged segments of the population are promoted Finally, to ensure that the subsequent growth is indeed sustainable, and to minimize its adverse impacts on the environment, the preservation and sustainable use of the natural resource base is a target

1 2 Respond to the need for international cooperation to achieve specific challenges to the attainment of the goals outlined above Components of this broad goal include implementation of strategies to deal with particular concerns of the United States such as narcotics interventions, terrorism, and environmental degradation In addition, efforts will be made to support United States foreign policy initiatives

1 3 Individual Country Goals Table 1 shows how the broad goals outlined above appear in the CDSS papers and Action Plans for each of the LAC Missions, while Table 2 shows which missions formally mentioned the specific sub-objectives The goals are organized into the following categories 1) lay the basis for sustained economic growth, 2) ensure that the benefits of economic growth are shared by the entire population, 3) promote the economic stabilization of the country, and 4) increased democratization

2. Macroeconomic and Sector-Specific Policies and Projects

In the LAC region, the goals and objectives outlined above have been articulated into a number of specific policies and projects designed to achieve them These programs and projects emphasize

- macroeconomic policy reforms to promote export-led economic growth (structural adjustment)
- promotion of trade and investment through export-led diversification with credit programs, non-traditional agriculture and market development, and privatization emphasizing small businesses
- preservation and sustainable use of the environment

Macroeconomic adjustment policies promoted by A I D or negotiated as a part of an aid package fall into four broad categories monetary, fiscal, trade-related, and price-related policies Monetary policies include limiting the expansion of the money supply, restricting credit to the public sector, and (perhaps) expanding its supply to the private sector Fiscal policies attempt to limit government spending and improve tax collection capabilities in order to reduce fiscal deficits Trade-related policies include the reduction of barriers to free trade, such as tariffs, quotas, foreign exchange surrender requirements, and other implicit barriers that lead to over-valued exchange rates and distort incentives for free trade Price-related policies include the promotion of free market prices and measures to control the rate of growth of wages Many of the objectives outlined above can only be achieved through sector-specific interventions such as industrial/commercial development projects, trade promotion programs, interventions in the areas of health, population, nutrition, education, agriculture, and natural resources

B. ASSESSING POLICY/PROJECT-RELATED CHANGES IN HOUSEHOLD AND INDIVIDUAL WELFARE

The A I D /LAC Bureau goal of broad-based growth implies that indicators of policy and program success should somehow measure the change in the level and distribution of family and individual welfare Programs and projects that are successful relative to their own stated objectives may have wider reaching impacts on the welfare of certain groups, both positive and negative Thus, it is important to judge program/project success both in terms of performance

(achievement of explicitly stated project/program goals) and **impact** (total direct and indirect effects of project/program activities on household and individual welfare)

1. Performance vs. Impact Indicators

Policy/program performance indicators can be viewed as essentially "input and output indicators " For example, a deforestation project's immediate goal may be to plant X seedlings, or employ Y workers A count of actual seedlings planted or workers employed is a performance indicator Changes in nominal tariff levels are indicators of performance of macroeconomic policies designed to affect these changes Performance indicators are also used to measure the ultimate outcome of a certain policy, within the domain of the policy For example, an indicator of performance of an economic policy to promote investment and export-led diversification might be the value and variety of exports Performance indicators are always specific to a certain policy or project, and are intermediate indicators in that they do not reflect the total impact of a policy, program or project

Impact indicators, which measure outcomes that are beyond the domain of the policy or program, can encompass a wide range of indicators measuring such impacts as environmental effects, economy-wide effects, and changes in individual and family welfare These impacts can be measured at the aggregate (for a population as a whole--eg a country or a community), household, or individual level Often program or project impact is evaluated using aggregate indicators, which are gross estimates of particular circumstances Aggregate indicators, for example output (GNP), employment, general price levels, etc , tend to be well-understood and

widely collected, but usually present only an average picture of the concept they are describing. Some aggregate indicators do, however, provide information about welfare and the distribution of certain outcomes. The infant mortality rate (IMR) or the prevalence of malnutrition provide an aggregate description of the distribution of health and nutritional status. The percentage of families below the poverty line is also an aggregate indicator of the distribution of welfare.

Whether aggregate indicators reflect welfare and distribution depends on the form of aggregation, the level of measurement of the components, and the components themselves. The level of measurement determines the lowest possible level of disaggregation of the indicator. The availability of food, for example, can be measured at the individual, household, or national level (eg using food balance sheets). Indicator components are variables, such as prices, incomes, anthropometry, etc. Variables that are measured at very highly aggregated levels (such as national or regional) are generally less capable of being used to indicate welfare changes than household or individually measured variables. In order to reflect the level and distribution of welfare, the indicator must be disaggregable by socioeconomic groups. Indicators that are constructed of variables collected at the household level can, in principle, be disaggregated. Thus, ignoring measurement error, average food consumption calculated by aggregating household surveys can be disaggregated by socioeconomic groups or other categories of interest. Variables measured at the national level can never be used to construct disaggregated, household, or individual indicators.²

²In some cases, information about the distribution of the variable (perhaps from previous studies) can be used to estimate percentages below cutoffs given highly aggregated averages, eg, when the proportion of the population expected to have deficient calorie intakes is estimated on the basis of income distribution.

Comparison of variables to a norm or a standard at their initial level of measurement also allows aggregation of observations to form an indicator that reflects the distribution of welfare. The proportion of households not meeting a given standard creates an aggregated indicator of welfare. Household consumption standards (according to age and sex) and poverty lines are such norms. Nutritional status and infant mortality (where the norm is death/survival) are other examples.

Finally, to assess the impact of policies or programs/projects on welfare, the outcomes of interest can be measured directly (eg nutritional status), or intermediate indicators (eg, food consumption) or indirect (proxy) indicators (eg food expenditure) can be used. Intermediate indicators measure the effects of policies/projects as they work their way through the economy and cause changes in circumstances at the household level, but they do not measure the total impact. Proxy indicators measure indirect outcomes that are highly correlated with the outcomes of interest. Proxies may be more reliable than direct measures, and they may be more cost-effective to collect. For example, household expenditure is often used as a proxy indicator for income because it is more reliable (expenditures tend to fluctuate less than income, and thus provide a more accurate description of the household's permanent income) and easier to collect (people are more likely to truthfully report their expenditures than information about their income).

A number of related questions remain to be answered. First, are aggregate impact indicators adequate substitutes for individual-specific measurements? A second question is whether intermediate and proxy indicators can adequately approximate total welfare impacts.

Finally, which of the various welfare indicators provides the best measure of welfare changes? These questions will be addressed here and in the remaining chapters

2. Relationship Between Aggregate Impact Indicators and Welfare

Aggregate indicators such as GNP and total food availability are well understood and frequently collected. The empirical evidence on the relationship between changes in these indicators and welfare is presented in Appendix A, and a brief summary of the conclusions is presented here. The relationship between indicators of macroeconomic performance and changes in welfare depends on, among other things, the level of equity prior to and during growth, the type of government policies, particularly with regard to expenditures on health and education, and the sectoral distribution of growth. Previous experience shows that these circumstances are difficult to quantify and predict, and no universal rules exist. Therefore, it is likely that macroeconomic indicators of economic growth can not adequately estimate welfare changes.

The evidence in Appendix A shows that macro indicators of food availability, market prices, wages, and employment do not capture the essence of the distribution of benefits. Estimates of food availability, usually calculated from food balance sheets, ignore actual distributions among regions and socioeconomic groups and, hence, tend to understate nutritional inadequacies (O'Brien-Place and Frankenburger, Van Haeften, 1991). Van Haeften provides convincing evidence that aggregated calorie and protein supplies understate undernutrition problems in LAC countries. While food balance sheets and similar aggregate indicators can provide evidence about a country's ability to meet the nutritional needs of the total population

(assuming an equal distribution of foods), the fact that these indicators mask distribution inequities limits their overall usefulness

Other common aggregate indicators, market prices, wages and employment, also fail to provide a sense of regional and other disparities. The consensus of the literature on the measurement of welfare, poverty, nutritional status and food security is that national level indicators provide poor proxies for these individual or family-level outcomes³. At the same time, there is conclusive proof that at lower levels of aggregation there is more variability in outcomes than at higher levels, and by ignoring the sources of these lower-level variations, such as intra-household variations, serious measurement errors can result (Haddad and Kanbur, 1990). Thus, measures of poverty constructed at national levels surely understate the extent and degree of poverty.

The numerous studies evaluating A I D -supported programs, or the types of programs that interest the LAC Bureau, have employed a wide range of performance and impact indicators (see Appendix A). Economic, nutrition, health, educational, and general performance indicators are all used. The indicators themselves and their properties are not evaluated in these studies, rather they are assumed to closely proxy welfare outcomes and used to evaluate how the programs affect welfare. Welfare outcomes are found to vary depending on the structure of the economy and the program itself. There is only a weak correspondence between aggregated economic indicators and welfare outcome. Because of the complicated web of transmission and

³See Harrell and Franklin for evidence that country-level indicators understate nutritional problems in LAC, Staatz, et al , 1990, and Van Haeften for summaries of the problems associated with using country-level data to measure food security, an essentially family-level outcome.

linkages between policy initiatives and household outcomes, it is concluded here that welfare impacts can only be measured at the household level. Thus, if welfare outcomes are to be measured, household surveys are necessary. Clearly, more distant proxies for household-level impacts are more easily collected, but at the same time, more distance from the outcome generally results in less sensitivity and specificity.

The review in Appendix A summarized here confirms that changes in aggregate outcomes do not necessarily correspond to changes in the welfare of all members of society. Having established this, it becomes necessary to ask which indicators might be collected in order to monitor the impacts of macroeconomic and policy changes on the level and distribution of welfare. Various types of indicators and their use for measuring program and policy impacts are discussed in the following chapters as well as in Appendix A⁴.

⁴ Appendix A provides a summary of the empirical experience related to the use of specific indicators in the evaluation of structural adjustment, agricultural diversification and private sector initiatives in the LAC region and world-wide.

III. CONCEPTUAL FRAMEWORK

In the previous chapter it was concluded that aggregate impact indicators alone are not adequate to assess changes in household and individual well-being. In order to identify appropriate indicators that do reflect the level and distribution of welfare impacts, it is necessary to determine the mechanism through which policies and programs/projects effect household-level circumstances. In this section, the conceptual relationship between policies/programs designed to promote economic growth and the ultimate outcomes of concern such as poverty alleviation and the shared benefits of growth is developed. A simple model of the linkages between economic policies/programs/projects and welfare is presented. First, the mechanisms through which policies and projects that emphasize macroeconomic growth affect household resources is discussed. Second, the relationship between changes in household level resources and household and individual welfare is examined.

A. RELATIONSHIP BETWEEN ECONOMIC POLICIES/PROJECTS AND HOUSEHOLD RESOURCES

Virtually all economic policies and programs affect household and individual welfare through three avenues: **income** (changes in employment opportunities, transfer payments, etc.), **prices** (implementation or removal of subsidies, exchange rate adjustments, etc.), and **services** (health, education, water and sanitation, etc.)⁵. Income, prices and services directly affect the

⁵Some projects or programs may also directly affect knowledge and behavior (for example, health education projects), or household control of resources (for example, employment generation projects directed to women). However, the major effects on household welfare are expected to occur through income, prices, and services.

resource base of the household, which largely determines the household's access to the input. into welfare (food, health care, education, etc) As changes in prices, household income and services occur, the impact on family and individual welfare is modified by household behavior and the response of the household to such changes, as well as by the distribution and control of resources within the family Figure 1 describes the principal linkages between macroeconomic policies and programs, household resources, and family and individual welfare

1. Incomes and Prices

Household income (both money received and the imputed value of goods produced and consumed by the household) is perhaps the most important factor in welfare because it determines the level of physical consumption a household can achieve Economic policies and programs affect household income directly by changing the amount and nature of transfer payments, and by stimulating changes in employment possibilities, hours, and wages Economic adjustment programs often require reductions in public expenditures to balance public budgets, which tend to decrease incomes for certain groups because of layoffs in the public sector, reductions in transfer payments, etc

Economic growth-oriented policies and programs also have innumerable indirect effects on household incomes by influencing relative growth and productivity across sectors Depending on the nature of a program, incomes of different population groups and geographical areas are affected differently For example, export promotion programs may increase the incomes of producers of export commodities, yet lower the incomes of producers of non-tradeable

commodities whose product prices fall relative to tradeable goods. This relationship is especially important in Latin America, where a large proportion of the urban poor is employed in the informal sector, which produces mainly non-tradeable goods.

Prices and income together determine a household's real income, or purchasing power. Real income (nominal income deflated by appropriate cost of living indices) is a measure of the purchasing power of a household's income at current prices, given average consumption patterns. Real income can be compared across time and across groups facing different prices. Cost-of-living indices are determined by the types of products a group of consumers normally consumes, and the prices of those goods and services. Thus, if prices or market baskets vary systematically within a country (geographically or by demographic group), the appropriate price index will also vary. Because of differing consumption patterns and relative prices, price shifts may affect the real incomes of various groups differently. Prices and incomes are also interrelated by the effects income changes can have on prices. Changes in income cause prices to change through shifts in demand. Different rates of growth for different income groups will lead to changes in relative prices over time, since income elasticities of demand⁶ vary by income level.

Macro-economic policies and programs/projects can affect prices directly by removing or imposing controls on them (taxes, tariffs, subsidies), or indirectly by influencing demands and supplies. For example, programs to promote export growth might directly reduce export tariffs and controls, change exchange rates (and indirectly affect prices of both imported and domestically produced goods), or stimulate additional supplies. The impact of price changes on

⁶Income elasticity of demand is the percentage change in the quantity demanded caused by a one percent change in household income.

household welfare varies according to the direction and magnitude of the change in prices faced by individual households, and whether those households are net producers or consumers of the goods and services whose prices have changed. The impact also varies by region (depending on how effectively prices are transmitted through internal markets), by income, and by other factors that determine the goods a family purchases or sells. Farm households, for example, benefit as producers from increases in some product prices, but may lose as consumers. Monitoring prices that consumers and producers face can provide important evidence regarding the impact of policies or growth on population subgroups.

2. Services and Infrastructure

Policies and programs causing changes in expenditures on services and infrastructure for education, health, and water and sanitation directly affect the quality of and community access to these important inputs into welfare. Improved availability and quality of health, education, and water and sanitation at the community level improves household access to these inputs, and may also directly increase the resource base of households, which in turn improves household access to these services. The resource base of the household may increase as a result of the effects of education and health on labor productivity and income. For example, the World Bank (1980) found that the average social rates of return to education (in terms of increased wages)⁷

⁷Behrman (1990) describes the social rate of return to schooling as calculated by first estimating the private rate of return (the correlation between earnings and years of schooling, controlling for work experience), then making adjustments to account for other costs such as teachers' time, buildings, and equipment and supplies.

for all developing countries are 24.2 percent for primary education, 15.4 percent for secondary education, and 12.3 percent for post-secondary education

The relationship between health and nutritional status and labor productivity has been more difficult to quantify due to estimation problems, but a review of the available evidence by Behrman (1990) finds that there are significant positive effects, both short- and long-term, of health and nutrition on the labor productivity of poor individuals in developing countries. There is similar evidence, though less persuasive statistically, regarding the impact of health and nutrition on schooling productivity.

B. RELATIONSHIP BETWEEN HOUSEHOLD RESOURCES AND WELFARE

The quantity and quality of the resources available to the household (modified by intra-household control and distribution) is the single major intermediate step through which economic (and social) development policies, programs and projects can directly influence household and individual well-being. The availability of household resources affects family and individual well-being through three primary mechanisms: (1) determining household access to food, both purchased and produced by the household for direct consumption, (2) influencing the knowledge and behavior of household members with regard to feeding and both preventive and curative health care⁸, and (3) affecting household access to basic services such as water, sanitation, health care and formal education (see Figure 1).

⁸ Knowledge and behavior are likely to be modified also through direct program/project actions, e.g. nutrition and health education programs, somewhat independent from household resources (Hornik, 1985)

1. Access to Food and Nutrients

Until very recently, it was widely believed that increases in household income would be sufficient to improve food intake and nutritional status of household members. Because of Engel effects, marginal increases in income are expected to be spent largely on food, and increased family food availability should in turn lead to more nutrients consumed by each of its members. Increased nutrient consumption should improve nutritional status, other factors (mainly those affecting biological utilization of food) being equal. Evidence clearly shows, however, that increases in family income are not necessarily translated into significant increases in calorie intake and improvements in nutritional status. Conversely, declines in income may not automatically imply a deterioration in nutritional status⁹. Some of the reasons for the breakdown of the relationship between household income and nutritional status are discussed below.

The relationship between household income and individual food consumption is modified by specific household behavior (including breast-feeding and weaning practices) and intra-household distribution factors¹⁰. Furthermore, the relationship between food consumption and nutritional status is modified by factors affecting nutrient needs and the biological utilization of food (for example, energy expenditure and incidence and severity of infectious disease). Also,

⁹Indeed, much of the evidence related to the impact of economic changes and structural adjustment in the 1980s indicates that for many LAC countries, the economic downturn did not produce a corresponding downturn in health and nutrition indicators.

¹⁰The relative decision-making power of the father and the mother (or other older members of the extended family so prevalent in development societies) in regard to food consumption in non single-parent households may vary among sociocultural settings (Leslie, 1988, Roldan, 1987).

as noted in numerous studies (see Deaton, 1987, Bouis and Haddad, for example), as income and expenditures increase, even poor consumers begin to demand more diverse diets and consume higher priced nutrients ¹¹

Estimates of the impact of increased income on family nutrient consumption (mostly calories and protein) vary widely ¹² Calorie elasticities (the percentage change in household calorie availability given a one percent change in income) range from near zero to over one ¹³ Low values mean that large increases in household income are needed to produce small increases in household nutrient consumption The size of these elasticities are, therefore, of extreme importance, and if low elasticities prevail, then income increases should not be expected to alleviate malnutrition in the short run The weight of the evidence shows that nutrient elasticities fall into the 10- 40 range and may be substantially higher for the poorest income groups ¹⁴ The upper end of this range is quite consistent with increased incomes leading to better nutrition, though it is not at all clear that for many countries and income groups the lower end of the range does not prevail

¹¹There is now emerging a rich literature on the tenuous relationship between income growth and consumption of nutrients See the summary in Appendix A

¹²See Alderman (1986, 1990) and Bouis and Haddad (1989)

¹³Wolfe and Behrman (1983) report a calorie elasticity of .01 for Nicaragua, while Behrman and Deolalikar (1987) report an elasticity of calorie intake of 1.18 for India Bidinger, Nag, and Babu found that income is not a significant determinant of calorie intake Many of the IFPRI studies of commercialization of agriculture have reported the same finding (see Appendix A)

¹⁴See Pinstrup-Andersen and Caicedo (1978), and Ravallion (1990) for evidence that nutrient elasticities are much higher for low income groups

2. Interaction Between Knowledge, Behavior and Access to Welfare Inputs

The knowledge and behavior of family members, particularly mothers, is critical in determining how welfare inputs available to the family are utilized to improve health and well-being. Knowledge and behavior are influenced by a wide variety of factors, such as access to formal education, exposure to nutrition and health education programs, and cultural beliefs.

Education is particularly important because it can also affect how decisions are made and how resources are controlled in the family. This may in turn enhance the household's efficient use of other inputs into welfare. Maternal education, in particular, has been shown to be an important determinant of child welfare.¹⁵ Maternal education can affect household health and well-being through increased earnings potential and more efficient use of food, health services and other welfare inputs. For example, better educated mothers have been shown to enhance the impact of health and sanitary infrastructure on their families or to be better able to protect their children from unhealthy environments.¹⁶ Education also improves mothers' access to and use of information about appropriate health, hygiene, and nutrition practices (such as appropriate feeding practices, including optimal breast-feeding).

¹⁵Some authors argue that the effects of maternal education on child and household health and nutrition that have been shown in some studies are overestimated because maternal education is a proxy for unobserved endowments, such as habits related to family upbringing that may be more important determinants of household welfare. However, Thomas, Strauss, and Henriques (1990) controlled for parental endowments (using parental height as a proxy for unobserved family background characteristics) and found that maternal education remained a significant determinant of child nutrition.

¹⁶From estimates of reduced form demand equations for health for samples of children stratified by age, Barrera (1990) found that the pattern of interactions between maternal education and public health programs suggest that maternal education affects child health through an efficiency effect (by affecting the productivity of health inputs) and an allocatable effect (by lowering the cost of information). Barrera's estimated equations also suggest that maternal education is a substitute for community cleanliness.

Likewise, household access to other basic services (eg sanitation, preventive health care) is directly related to the risk of disease, particularly infectious diseases in children, such as diarrhea, respiratory infections and diseases preventable by immunization. Ultimately, the health and nutritional status of the members of the household, especially of children, is a function of the synergistic interaction of two direct determinants: food/nutrient intake and health/morbidity experience, mainly from infectious diseases (Martorell et al , 1990, Becker et al , 1991). The health and nutritional status are important determinants of the risk of child mortality and survival¹⁷

IV. DIMENSIONS OF HOUSEHOLD WELL-BEING

The simplified model of the relationship between economic policies and programs and household and individual welfare presented above is based on a much more complex interaction of the many dimensions of a household's economic circumstances and welfare outcomes. In this section, the key economic and welfare dimensions of the household and individual are presented in more detail. The implications of these dimensions for indicator selection and measurement issues are also discussed.

¹⁷ Infant and child mortality reductions may be achieved through provision and improved access to basic health services, without significant changes in morbidity rates (Joseph, 1985, Mosley and Becker, 1989, Huffman and Steel, 1990)

A. ECONOMIC DIMENSIONS

1. Income and Expenditures

Economists generally agree that social welfare is some combination of individual and family utility,¹⁸ and that this utility is a function of consumption or income levels. Using either income or consumption as an indicator of welfare is valid, though consumption may be preferred because of greater stability over time, and ease of collection.¹⁹ Consumption tends to be smoothed over time, while income can fluctuate on an annual basis or with seasonal changes in employment opportunities or, in rural areas, with agricultural cycles. People with variable incomes tend to save during periods of abundance and dissave during lean periods, so consumption and welfare tend to be more constant than income. Though there can be wide seasonal swings in consumption, these swings are less pronounced than variations in income. Consumption and expenditure data tend to be easier to collect than income because of respondent sensitivities to questions about income. Furthermore, income is often difficult to measure for self-employed individuals such as farmers and participants in the informal sector.

There are some problems associated with the measurement of expenditures, and with the use of household expenditures as a proxy for individual welfare. Intra-household distribution

¹⁸There is a rich literature on the determinants and existence of social welfare functions. For an introduction and summary see Deaton and Muellbauer (1980), Ch 7, 8, and 9.

¹⁹Consumption is usually measured in terms of expenditures on goods, which eliminates the need for distinguishing between goods of different qualities (equal quantities of goods of very different quality will be associated with very different expenditures, even though amounts consumed are identical). These issues are discussed by Glewwe (1987). Levels of consumption, of course, are not the only determinants of utility, indicators such as nutritional status and health which measure this non-economic dimension will be discussed below. Schuftan (1978), however, note that more than any other variables, consumption expenditures best define poverty.

issues tend to cloud the relationship between household expenditures and individual welfare. An important measurement issue is that expenditures for durable goods tend to be lumpy, if a household saves to make a large purchase, then the measurement of expenditures during the purchase period will lead to an overestimate of household welfare. The estimation of expenditures should smooth out this lumpiness. Expenditures on some items such as housing and durables often have to be imputed (i.e. changed to an average flow of expenditures rather than a lump expenditure)

Economies of scale in expenditures on durable goods may also distort welfare estimations. For example, a household of four may receive the same utility from the purchase of a cooking stove as a household of two. However, when ranked by per capita expenditures, the household of two will appear to be relatively better off. For these reasons, using food expenditures rather than total expenditures is suggested by some (Glewwe, 1987, for example). Food expenditures exhibit fewer returns to scale and are more constant than total expenditures, and they are more easily and accurately measured than non-food expenditures. In addition, food price indices are frequently easier to construct than non-food price indices.

Food expenditures, however, also pose certain problems as an indicator of welfare. First, the value of home-produced foods has to be estimated, though this problem can be dealt with directly through questionnaire design.²⁰ A second problem is that looking only at food expenditures ignores the other market-purchased sources of welfare (clothing, housing, etc.), and has been shown to produce inconsistent welfare rankings. Glewwe (1987) examined the

²⁰This problem of estimating the value of home-produced foods consumed also exists when measuring total expenditures. World Bank experience with recall of home-produced values indicates that households can accurately place a market value on their consumption.

relationship between welfare rankings based on per capita food expenditures (by family) and those based on per capita total expenditures, and found that the latter was a better measure. The reasons for the differences were related to errors in measurement of food expenditures, and thus Glewwe reasonably concludes that per capita total expenditure is a better indicator of welfare than per capita food expenditures.

A problem with using either food or total expenditures, or family income is that it is difficult to compare expenditures for families with different demographic characteristics. The most frequent method of overcoming this problem is to adjust consumption by using adult equivalent scales, which measure the "cost" to the family of having members of different ages or gender.²¹ If accurate conversion scales are available and if total expenditures on durables can be imputed correctly, then total expenditures per capita is a preferred welfare measure. Adult equivalent scales, however, are usually quite arbitrary and are difficult to estimate if data-based derivation is desired. Glewwe (1987), however, showed that per capita total expenditures without standardization by adult equivalent scales provides an adequate measurement of welfare.

The food ratio, or food expenditures divided by total expenditures, has intuitive appeal since there is no need to adjust for household size or composition. In fact, food ratios have been widely used as indicators of welfare since Engel first observed that as incomes rise, the share of food expenditures in the total household budget declines. Engel's law is one of the most widely supported empirical findings in economics. Though there is recent evidence that Engel's law does not hold for all countries and for all (especially poor) income groups (see Thomas,

²¹Adult equivalent scales are discussed in detail in Chapter 8 of Deaton and Muellbauer (1980), and in numerous other sources. They weight different members of families differently based on age and perhaps sex. Sometimes these weights are determined by nutritional needs (see the Amsterdam Scale on p. 193 of Deaton and Muellbauer).

1986), there is still considerable appeal in using it. In order to calculate the food ratio, expenditures on both food and non-foods need to be collected. The non-food expenditures should include housing values and expenditures on durables.

The data requirements for the food ratio may weigh against its use, though additional factors favor its use. In order to monitor the effects of policy changes on welfare outcomes over time, annual or less frequent measurements are required. Furthermore, normal economic forces cause price levels and relative prices to change over time. Thus, in order to compare expenditure-based welfare measures over time, price indices for the different periods are needed to deflate expenditures. Though some indices are normally collected as a matter of course by national statistics bureaus, they are average indices, not specific to the budgets of different socioeconomic groups, or not reflecting sometimes substantial inter-regional price or budget share variations. The food ratio does not require that these price indices be computed, and can still be used to compare changes over time. Thus, the food ratio offers the advantages that less frequent data collection is needed and price indices, which may be somewhat arbitrary, are not required.

In summary, the literature shows, in general, that total expenditures (adjusted for household size), is the preferred indicator of family economic well-being²². The option of using only food expenditures eliminates the need for imputing durable expenditures, but carries with it the need to construct food-specific price indices to make inter-temporal comparisons. Consumer price indices are available for developing countries, but do not represent accurately

²²As is pointed out above, and in Appendix A, government policies may affect different socioeconomic groups differently. Some of the evidence in Appendix A shows that some government programs did not affect expenditures. This does not mean that expenditures are not good indicators of welfare, only that these policies did not affect the economic dimension of welfare.

the cost of living for many population subgroups. The food ratio eliminates the need to compute price indices to make intertemporal comparisons.

2. Employment and Wages

Employment or wage data are often used as proxies for income or expenditures, or even well-being, since they are frequently collected by national statistical bureaus and are well understood by policy makers. Employment or wage data may have serious weaknesses depending on their method of collection and whether they are highly aggregated. When disaggregated wage and employment data are collected, such as through household surveys that include other economic and social conditions, they can provide information on who in a family has access to resources, and the extent of involvement of a family in labor markets. These two factors could affect family welfare independently of their impacts on income or expenditures.²³

National-level (aggregate, or broken down by income or occupational class) data on employment are notoriously unreliable, especially for comparisons over time and in rural areas where most of the poor live (the World Bank, 1986). This is particularly true in Latin America where informal sector employment (not commonly measured by employment data) is a large fraction of total employment. Open unemployment, or the number of people of working age not

²³See Bouis and Haddad (1989), vonBraun, et al., 1988 a, 1988 b, and 1991 for a review of some of these issues. Basically, there is an argument that more complete involvement in formal labor or product/markets, increases access to information which might lead to improved welfare outcomes. Also, more varied income sources tend to add stability to earnings.

working (in formal or informal jobs), is difficult to measure²⁴ Measures of open unemployment also present distorted pictures of employment, since underemployment, often widespread, is excluded

Indicators of underemployment, however, also tend to be unreliable indicators of income One useful indicator may be a sectoral composition of employment As jobs disappear in urban areas, fewer workers are absorbed by the formal sector Thus, changes in the level of agricultural, informal sector, and government employment relative to private formal sector employment provides some indication of changes in welfare The World Bank (1986) showed that employment composition changed dramatically in response to the economic crisis in Latin America during the 1980s They note, however, that without good income or earnings data by sector, the sectoral composition of employment does not provide an accurate indication of the magnitude or direction of the change in welfare Sectoral employment shares will vary dramatically with the structure of the economy and from country to country More information about these structures is needed before these indicators can be used to make inter-country or inter-temporal comparisons Use of the indicator also presupposes that non-formal employment can be accurately measured

Wages suffer from some of the same deficiencies as employment data, they are oriented toward the formal sector, they are unreliable in rural areas, they do not usually include in-kind payments, etc In addition, wages have been shown to mask underlying trends because of built-in rigidities in many Latin American countries (Bourguignon) Several sources have suggested that the number of income sources a family has access to may be more important to household

²⁴Though there is strong evidence that open unemployment increased quite dramatically in Latin America during the 1980s (The World Bank, 1986, Musgrove, 1987, see Appendix A)

welfare than actual income measured at one period in time (Reutlinger, 1987, Downing, 1990, Haddad, et al , 1991) This variable is easy to collect and appropriate for identifying vulnerable households, but its use as an indicator of welfare at a country level or over time is inappropriate. The relationship between the number of income sources and welfare surely varies by country, and within country between urban and rural areas and across regions.

3. Measures of Wealth

Several authors argue that while consumption, income, and expenditures all reflect welfare, the resources or assets to which a family has access (or its entitlement) more directly determine the welfare of its members (Sen). Thus, several direct or proxy measures of these resources have emerged. Land ownership is a widely used indicator that is especially reflective of social status in Latin America. Changes in land ownership patterns, though usually occurring over a long period of time, indicate changing control over resources. Increased landlessness means that more people depend on labor sales as sources of incomes. Tenure status, intensification of land use, number of plots, and land quality are indicators whose use is related to land being a critical determinant of well-being in agricultural areas, though not in urban areas. Many of the studies of agricultural diversification use landholding concentrations to evaluate the program's impact (see Appendix A).

Other types of assets used as indicators of wealth include livestock holdings, housing, and more liquid assets. Livestock can be an important store of wealth, so that livestock sales can be a critical indicator of household stress (Ravallion, 1990, Currey, 1978). Anthropologists

have shown that the ability to market livestock helps determine who will survive a famine and who will not (Shipton, 1990) These types of indicators are especially appropriate to identify vulnerable or food insecure households (Haddad, et al , 1991)

B. NUTRITION AND HEALTH DIMENSIONS

1. Consumption of Foods and Nutrients

The consumption of foods or nutrients is an important dimension of household well-being The appeal in using it as an indicator of welfare impacts stems from the fact that actual quantities of food consumed (rather than expenditures) determine health and nutritional well-being, as food consumption is closely linked to nutritional status²⁵ This link can be important, since nutritional status is a critical determinant of welfare The use of quantities of food or nutrient consumption as an indicator of welfare, however, has some serious shortcomings First, the impact of food consumption on health and nutritional status is affected by factors such as household sanitation, hygienic and health care practices that influence biological utilization of nutrients For example, the benefits of increased food consumption may be lost when accompanied by increased episodes of diarrhea²⁶ Also, a poorly educated mother may not have adequate hygienic and health care practices (i.e. food preparation and dietary management

²⁵Notice that while quantities consumed affect welfare, the only firm link between quantities of nutrients and welfare is through their input on nutritional status (see Rosenzweig and Pitt)

²⁶ However, recent studies by Lutter et al suggest that the nutritional impact of supplementary feeding programs on children may be more significant among those at greatest risk of diarrhea and thus with increased nutrient requirements (Lutter et al, 1989)

of infectious diseases such as diarrhea), and exposure to infection may reduce the child's food intake and affect the nutritional impact of food consumption by diminishing absorption and utilization of nutrients. Thus, monitoring food consumption alone, without monitoring the other inputs into nutrition (maternal education, sanitary and water services, access to health care, etc.) may not provide an accurate picture of household and individual health and well-being.

A second problem with indicators of food or nutrient consumption is that they are often more difficult to measure than expenditures.²⁷ Recalling quantities (or measuring them) is more difficult than recalling expenditures, and the conversion of foods into their nutrient composition is cumbersome and vulnerable to error. This conversion depends on the quality of the food, along with cooking technology and the education of the food preparer. Thus, although quantities of food consumed (adjusted for quality) are directly related to welfare, there are strong reasons arguing against their use as indicators.

2. Physical Growth of Children

Anthropometric measurements of children's physical growth represent the single best source of information on welfare in the LAC A.I.D.-priority countries. Where the prevalence of malnutrition and child mortality is high, such as in A I D child survival emphasis

²⁷Much of these issues were discussed during the design of the World Bank's Living Standards Measurement Survey instruments. See some of the earlier working papers in the LSMS series. Adjusting quantities consumed for differing qualities is clearly the most important shortcoming associated with using quantities.

countries²⁸, anthropometric indicators of children's physical growth may provide the best indication of society's treatment of their poor. The human response to adverse conditions during early life is a slowing of normal physical growth and development. Inadequate growth in early childhood can persist through life as smaller stature and weight in comparison to values seen in unconstrained populations (Martorell et al., 1990, United Nations, 1990).

Anthropometry has intuitive theoretical appeal in terms of the concept of individual human welfare. More importantly, it is the most objectively measurable aspect of individual welfare. Anthropometry reflects the individual-level impact of the combination of social and biological processes related to social welfare. Anthropometric measures are influenced by the multiple processes that affect the quality and quantity of nutrient intake on one hand and the biological utilization of nutrients on the other. These measures reflect the basic and most fundamental proximate determinants of human welfare, that is, care that an individual (child) receives, morbidity experience, and access to food. Furthermore, reliable methodologies for measurement and analysis of anthropometry in children are readily available. Such measurements (especially weight) are widely used in the LAC region in primary health care and maternal and child health (MCH) facilities, and can be incorporated into existing information systems and periodic surveys, with modest requirements for training and equipment.

Although there are a variety of measures that can be used, most of them reflect one or both of two basic dimensions of body composition: soft tissue mass (weight) and attained height. Weight and height are objective measures of body mass and linear growth whose increase over

²⁸ A I D -child survival emphasis countries share both the highest rates of malnutrition (the prevalence of global malnutrition ranges from 13.3% to 37.4% and that of stunting from 26.8% to 57.9%) and the greatest mortality rates among children under 5 years (above 85 per 1,000 live births) in the region.

time is a basic component of the growth process (e.g. weight-for-age, length or height-for-age)

Anthropometric measures by themselves provide little useful information, they are used to derive indices that are then summarized into indicators that are often used to estimate the prevalence of malnutrition. First, at the individual level, an anthropometric measure must be converted into an index (e.g. weight-for-age, height-for-age) that compare an individual's measure to reference values for the age and sex. Anthropometric indicators result from using a conventional cut-off point to estimate the proportion (prevalence) of individual values that are below such point (e.g. the proportion of children of a defined age and sex for whom a given anthropometric index falls 2 or more standard deviations below the median or mean of the reference population). Therefore, these indicators are used only for population assessments and have no meaning for the individual (United Nations, 1990). There is a highly developed technical literature on this subject which is beyond the scope of this paper (Beaton et al, 1990)

The major anthropometry indicators used for children are weight-for-age, height-for-age, weight-for-height and arm circumference-for-age. **Weight-for-age** is the most common anthropometric indicator traditionally used in health programs for diagnostic, screening, monitoring and evaluation purposes. It provides a useful summary of physical growth attained expressed as cumulative body mass²⁹. **Length or height-for-age** (attained length or height relative to the reference value) is the result of linear growth, sub-normal values are taken to reflect chronic or historical deprivation of access to societal resources resulting in environmental deprivation (mainly insufficient food intake and frequent morbidity). **Weight-for-height** is seen

²⁹Birth weight is conventionally seen as a useful indicator of overall fetal growth that, in turn, is to a great extent a reflection of the mother nutritional status before and during pregnancy, however, the prevalence of low birth weight, an indirect indicator of pregnant women's well being is not frequently available because birth weight is not routinely measured in most countries of the region

as an indication of current nutrient stores available to the individual, and low values are regarded to reflect "wasting" which is generally accepted as an indicator of acute malnutrition (often the result of a recent episode of acute infectious disease or acute food shortages)³⁰ Weight-for-height and arm circumference are both indications of thinness or soft tissue mass. Both of these measures are relatively volatile in young children and can change rapidly as a result of acute food shortages or episodes of morbidity. Arm circumference is less sensitive to dehydration due to diarrheal disease than is weight-for-height, however, arm circumference has some undesirable measurement characteristics and is not as widely accepted a sensitive measure (Beaton et al, 1990)

Table 3 summarizes commonly used indicators of adult and child nutritional status and the criteria for classification of undernutrition. The table partially illustrates the diversity of indicators and their interpretation. An immediate question arises as to which demographic group best reflects welfare. Historically, young children have been monitored because they are the most biologically vulnerable to environmental influences, and because the growth velocity is greatest during early childhood, which permits easier detection and monitoring of growth. Exclusive use of child anthropometry may obscure societal discrimination against other demographic groups, such as women or the elderly, or ignore other family members whose nutritional status may be more closely linked to family welfare status. Unfortunately very little research has been undertaken on adult anthropometry. For the purposes of this review we will limit ourselves to the review of child anthropometry.

³⁰ Wasting has been consistently shown to be relatively infrequent in Latin American and the Caribbean (with few exceptions) thus suggesting that its prevalence might not be an adequate indicator of individual well-being in this particular region.

The prevalence of low weight-for-age is a global indicator of the state of nutrition and attained physical growth in overall body mass. It has been traditionally used in the LAC region to estimate the prevalence of global malnutrition and for child's growth monitoring purposes. As a global indicator, low weight-for-age does not distinguish soft tissue from linear growth deficit, which may be an important limitation when this distinction is relevant. A weight-for-age indicator does not distinguish, for example, a community in the midst of a severe famine from one that is experiencing chronic malnutrition. This indicator alone poses something of a peculiar problem in comparing country malnutrition prevalence in the LAC region because, despite the relatively low prevalence of wasting throughout the region, three A I D -emphasis Andean countries (Bolivia, Ecuador, Peru) do not have a high prevalence of children with low weight-for-age (in the 10-15% range, indeed almost the same prevalence as Brazil and Mexico), while having extremely high rates of stunting ranging from 30-40% (Sanghvi & Mora, 1991). Comparing weight-for-age data only would be somewhat misleading as many children are stunted but relatively heavy for their stature. However, weight-for-age must be considered because of the near universal availability of weight and age data through health service systems, particularly through maternal and child health programs as a part of growth monitoring.

Stunting, or retarded linear growth (low length or height-for-age), whenever feasible, may in some cases be more relevant for most Mission uses. Stunting reflects the cumulative effects of social deprivation over the course of early childhood (probably at least the first two years). Interpretation of stunting varies with age, while in very young children (probably first two years of age) it may be an indication of a process of failing to grow, in older children it is likely to reflect a state of having failed to grow. It should be recognized that small size has

changed from being a predictor of an undesirable health outcome to being the undesirable outcome of poor well-being, as the ACC/SCN of the United Nations contends, "it is the factor associated with the process of becoming small, not the state of being small, that are the real concern, albeit both are marked by achieved size" (United Nations, 1989)

A number of studies have suggested that stunting may not be reversible after the second or third year of life, that is, even if welfare changes occur after that time, a child's growth may not be responsive to these changes. These findings would suggest that monitoring should concentrate on children less than three years of age for measuring short- to medium-run changes in welfare. For longer-range welfare changes, it is also important to consider the utility of school entrant height censuses that are being periodically implemented in a number of LAC countries. The advantage of this approach to gathering anthropometric indicator data is its high population coverage in countries where school enrollment is very high, thus the height census would produce low-cost and relatively population-representative data.

Growth rates of young children and the final body size actually achieved result from the interaction of genetic and environmental factors. While failure to grow at normal stages of development may represent a missed opportunity with a lasting effect observed as stunting at older ages, recuperation from the trans-generational cumulative effect of environmental deprivation on physical growth potential has been shown to take more than one generation under optimal environmental conditions. Both persistence of child stunting throughout life and its slow recovery through generations have important implications for the interpretation of stunting as a welfare indicator.

3. Child's Health and Survival

As described in the conceptual framework, household and individual well-being may be reflected in the health status of the individuals, particularly of children, and ultimately affect the chances of child survival. This is usually the result of a constellation of factors including child's exposure to and incidence of infectious disease (morbidity), child health care practices at home, and access to timely and quality health care. Child morbidity indicators (e.g. the incidence of disease expressed as the number of episodes per child/year), especially those related to the most common diseases of childhood (diarrhea, acute respiratory infections (ARI), and diseases that could be prevented by immunizations) may be considered as measures of household well-being.

The frequency with which children get sick has theoretical appeal as an indication of household well-being, and it has been consistently shown that child's morbidity is highest in the poorest households. ARI and diarrhea are by far the most frequent diseases of childhood. However, measuring their incidence during a given period of time would require longitudinal observations that are not normally feasible. An alternative would be to focus on morbidity prevalence (rather than incidence), expressed as the proportion of individuals in a given population who are reported to be sick (from a given disease) at a particular point in time (point prevalence) or over a period of time (period prevalence). An example is diarrheal morbidity in children over the 2-week period preceding an interview, which is often collected in demographic

and health surveys (DHS) and other household level health surveys³¹ Nevertheless, no evidence is found in the literature that child's morbidity is responsive to changes in economic growth over time This is certainly a potential area of further research

In developing countries the period of infancy and early childhood is one of extreme vulnerability to changes in well-being, such as conditions surrounding birth, communicable diseases, lack of adequate nourishment, and a myriad of other threats While infants and children in LAC A I D - assisted countries account for about 15% of the population, nearly one third of the total deaths occur in this group There are two basic universally accepted indicators of this important dimension of population well-being **infant mortality**, defined as the annual number of deaths of infants under one year of age per 1,000 live births, which more specifically indicates the probability of dying between birth and exactly one year of age, and **child mortality**, defined as the annual number of deaths of children under five years of age per 1,000 live births, which more specifically indicates the probability of dying between birth and exactly five years of age

Infant mortality is one of the most widely accepted and used indicators of infant well-being, and social and economic development in general It has been used by A I D in all regions as a valid criterion for assigning priority in child survival interventions to certain countries Child mortality has been recently proposed as a more global indicator of well-being that encompasses also the important pre-school age period from 1 to 5 years of age, since social, economic and environmental influences on child's health and nutrition continue to represent a

³¹ The annual incidence (AI) of acute diarrhea in children may be estimated on the basis of 2-week prevalence rates (assuming an average duration of 5 days per episode of disease), by using the following formulation $AI = 2\text{-week prevalence} \times 19.2$ For a 2-week prevalence of 25.0%, the annual incidence would be $0.25 \times 19.2 = 4.8$ episodes/child/year

serious threat to child survival well beyond the first year of life. Significant reductions in infant and child mortality rates have been achieved in most developing countries, particularly over the past decade. It is well known that further reductions in infant and child mortality become more difficult and slower when medium to low mortality levels are achieved. However, despite significant progress, infant and child mortality rates in LAC A I D -emphasis countries continue to be high and may still be quite sensitive to changes in household and individual well-being.

Infant and child mortality indicators, although derived from individual data, are estimated at the population rather than at the household level. The estimation of household mortality indicators (e.g. proportion of deaths out of children born) is more difficult and prone to error due to poor reliability of retrospective information on births and deaths over relatively long and variable periods of time. At any rate, data on which to estimate population infant and child mortality rates are likely to have reliability problems, e.g. because of under-reporting of both births and deaths, thus every effort should be made to improve the quality of data. Furthermore, given the enormous variation in infant and child mortality rates that are often observed between regions and socioeconomic groups within a given country, and the likelihood of major differences in mortality changes among specific population groups, it would be desirable to estimate infant and child mortality indicators disaggregated to the extent possible by geographic region and population group.

V. RECOMMENDED SET OF INDICATORS

A. CRITERIA FOR SELECTION OF INDICATORS

Many different types of indicators can be used for different purposes, and thus it is important to clearly define the intended use of the indicators before they are selected. The indicators recommended in this paper are intended to monitor the effects of policies to promote economic growth on the welfare of different population groups in the LAC region. This is critical to understanding the selection of specific indicators, which was based on the following criteria

1 The different dimensions of welfare, including those components that can be purchased in the market and those that cannot, should be represented by the indicators. Economic, health, and nutritional status should be measured. Also, the programs being promoted by A I D in the LAC region have different implications in the short run compared to the medium and long run, thus, indicators of both short-term and long-term impacts are needed.

2 By its very nature, welfare is individual-specific, and highly aggregated measures do not adequately reflect welfare changes. This was demonstrated in the conceptual framework and is supported by the empirical evidence. Hence, indicators should be measured at the individual and household levels. Differences in intra-household distribution of food and other resources mean that benefits of household economic improvement will not necessarily be shared equally within the household. In particular, gender and age-related distribution issues tend to

lead to wide disparities in well-being within the household. In addition, individuals have different levels of "welfare needs," for instance, nutritional needs depend on age, activity levels, health status, and other factors such as pregnancy and lactation.

3 Since welfare changes are the outcomes of interest, the indicators should be sensitive to changes in welfare. That is, if welfare changes, then the indicators should reflect this change. Some indicators used to identify poor or vulnerable groups for targeting may not be appropriate, since they usually provide no indication of changes in welfare. The analyses of these indicators have not established their ability to reflect changes in welfare.

4 The indicators should be sensitive to welfare changes for different segments of society, such as rural and urban, disaggregated by socioeconomic status. Many of the policies considered, such as macroeconomic reforms, affect various groups differently (see the literature synthesis in Appendix A). This concept is extremely important in Latin America, where there is wide diversity between geographic areas and socioeconomic groups.

5 The indicators should be specific to changes in welfare. A change in the indicator should mean that welfare changes are occurring. Below it is argued that GNP is neither sensitive nor specific to changes in individual welfare. Indicators that are both sensitive and specific are also valid and reliable.

6 The indicators should be appropriate across a wide range of countries and program settings. Since cross-country comparisons will inevitably be made, country-specific indicators should not be used.

7 Since the indicators will be used to present program impacts to Congress, they should be well-understood and widely accepted by different disciplines.

8 The fixed and variable costs associated with the design, collection, analysis, and sustainability of the data collection effort should be considered

These criteria are consistent with the stated purpose of monitoring the outcome of policies to promote broad-based and equitable growth. They are consistent with the criteria for indicator selection currently being used in the CDIE exercise Project Performance Information System for Strategic Management (PRISM). These indicators, however, differ from the CDIE criteria in that they are specific to selecting indicators for measuring welfare, whereas the CDIE criteria are designed to select indicators for overall mission operations.

B. RECOMMENDED INDICATORS

1. Economic Indicators

Three household economic indicators are recommended: (1) total expenditures, (2) food expenditures (both adjusted for household size and with appropriate price deflators to monitor price changes over time) and (3) the food ratio. These indicators were selected primarily because of their direct relationship to household well-being, as most of what brings welfare to families is purchased in the market or is produced with purchased inputs. The correspondence between expenditures and welfare ensures that these expenditure variables are highly sensitive and specific. They capture the economic dimensions of welfare, and are more indicative of long-run status than income or wage measures since they smooth seasonal swings. Expenditures can also be collected for different socioeconomic groups (even for subsistence

farmers who generally know the market values of home-produced foods) Expenditure variables are widely understood by policy makers, are accepted by a wide range of disciplines, and can be used to make cross-country and through time comparisons Total expenditures provide a means of making cross-country and cross-region (within a country) comparisons Food expenditures do the same, but add information on "subsistence-type" expenditures and are especially helpful when non-food expenditures are very lumpy The food ratio is easily compared across population groups and countries, and is best suited to track changes over time

Alternative indicators were eliminated by one or more of the above criteria Income is less preferred than any of these expenditure indicators, and is harder to measure Measures of wealth are also less preferred, and often more difficult to collect Those measures, such as land or livestock ownership, which proxy for wealth and are easy to collect are specific to geographic area (rural/urban) or to certain socioeconomic groups Comparisons of program impacts on other groups cannot be made Wealth tends to be stored differently by different economic and social groups (the difference in wealth storage between rural and urban areas is one notable example), and the wide diversity of these groups in LAC make the identification of a country-specific wealth indicator impossible

Wages and employment by sector tend to be highly aggregated, and are associated with formal sector employment The relationship between these indicators and welfare is specific to the country and the structure of the economy (e.g. the size of the informal sector) The responsiveness and reliability of indicators such as a composition/diversity of income sources, interactions with formal markets, etc. to family welfare have not been established region-wide and tend to be sector- or country-specific Price-based indicators, such as the cost of a market

basket, are incomplete indicators without information about income. Other indicators such as the amount of labor at the prevailing wage needed to purchase a minimum family food basket suffer from the same shortcomings as market-based wages.

Food and nutrient consumption were not chosen as indicators of welfare for a number of reasons. First, the accurate measurement of food and nutrient consumption is cumbersome, relatively expensive and more error-prone than the measurement of expenditures, this is especially evident when widespread differences in food qualities across regions and socioeconomic groups in Latin America are considered. Second, food consumption ignores the non-food component of consumption. Third, there is abundant evidence that household consumption of nutrients often respond sluggishly to changes in income, which may cause policy impacts on the middle classes to be understated.³² The insensitivity of nutrient consumption to income increases is especially true for the non-poor, but even the poor often do not allocate a significant portion of additional income to increased nutrients.

A fourth economic-related indicator is proposed: (4) percentage of school-age children actually attending school.³³ Though school attendance is measured at the community level rather than at the household level, this indicator is sensitive to changes in the short-run economic circumstances of families in a community, and also influences, and thus may be a proxy for, long-run potential (see the Chapter III). The studies of the impact of macroeconomic adjustment

³²There is substantial evidence that the economic crisis and subsequent adjustment programs of the 1980s had a disproportional heavy impact on the urban middle and lower middle classes in LAC. See Appendix A for a discussion of this evidence.

³³It should be emphasized that this is not the percentage of children enrolled or registered to attend school, but those actually attending. Thus, data would have to come from attendance taken by teachers rather than transcribed from school registries.

(and the evaluations of A I D 's private sector initiatives in the region) showed that school attendance was very sensitive to changes in economic circumstances. The most important impact of structural adjustment on education may be related to economic pull. Grosh (1990), World Bank (1986), and Hood et al (1988) documented a wide-spread fall in primary school attendance rates throughout Latin America, as families become strapped for money they may begin sending their children to work instead of school. Much of the increase in labor force participation in Costa Rica is attributable to school age children leaving school and seeking work (Hood et al, 1988). In many of these cases, however, the outcomes cannot be attributed solely to structural adjustment. Grosh (1990) and the World Bank (1986) document downward trends in school enrollments prior to the implementation of adjustment packages.

Other indicators of educational achievement exist, such as literacy rates, number of people with a certain level of achievement (e.g. primary school completion rates). These indicators, however, are likely to only be sensitive in the very long run or are sensitive to changes in the relative sizes of different age groups.

2. Nutrition and Health Indicators

The recommended indicators of nutritional status are (1) weight-for-age and (2) height-for-age among children younger than 36 months³⁴, and (3) height-for-age of children

³⁴ In some cases, prevalence figures may be estimated for children younger than 60 months because weight and/or height measurements are routinely taken from children in this age group. Break-down of indicators by yearly age groups should be possible so that analysis are primarily focused on the younger groups (e.g. less than 36 months) that are more likely to show changes in response to interventions or to changes in economic and other inputs.

entering the primary school system, expressed both as the prevalence and total number of children with low indicator values based on conventional cut-off points³⁵ The prevalence of either global (low weight-for-age) or chronic (low height-for-age) malnutrition is a direct indicator of welfare, as nutritional status represents one of the best measures of satisfaction of basic needs Height attained at the time the child enters primary school reflects the cumulative effects of a child's access to health and nutrition inputs throughout infancy and the pre-school period, and even further back into the prenatal period Thus, height-for-age is generally regarded as an important indicator of the quality of life during the most critical pre, peri and postnatal periods, with long-term implications for health, nutrition, cognitive development, school performance and social competence in adulthood The time lag between changes in welfare and changes in children's height-for-age at entry into the educational system has not yet been clearly established However, the relationship has been amply documented, in addition, data collection is relatively inexpensive because the school population is readily accessible As mentioned earlier, this indicator may be less relevant in countries where the coverage of primary school education is either low or inequitable

The existence of known and published international reference values for anthropometric indicators improves their utility While there are some debates as to the level and manner by which specific levels of anthropometric nutritional status indicators relate to growth, morbidity, and/or mortality, there is agreement as to how to standardize measures and what they mean physiologically Software and manuals exist which are supported by international agencies, and

³⁵ When weight and height data are available, a fourth nutrition indicator, **weight-for-height**, could be estimated, however, this is not generally recommended in the LAC region because of the relatively low prevalence of wasting (usually lower than 5%) in comparison with other regions

in most countries in Latin America there is a good capacity for nutritional surveys, with some having full fledged monitoring systems (Chile, Colombia, Costa Rica) in place and working

Malnutrition remains one of the most commonly accepted notions related to meeting basic human needs. The prevalence of global and chronic malnutrition is an objective outcome measure of welfare. The interpretation of malnutrition indicators for comparative purposes is therefore stronger than any other indicator. Because it is objective, it is not subject to context-specific measurement problems. Cost of collection depends, obviously, on the particular measurement strategy used. For example, if clinic data were used as a basis then anthropometry becomes as practical as almost any other indicator. To collect the data by sample surveys requires additional effort, approximately five to ten minutes per child plus transportation time. In many LAC countries the costs of even the more expensively generated estimates of malnutrition are relatively low compared with the expenditures of most Missions.

Two additional indicators of health status and child survival are recommended: (1) **infant mortality** and (2) **child mortality**. These indicators are sensitive to welfare changes, though break-downs by geographic regions, districts or specific socioeconomic groups are not often available. They measure both short-term and long-term influences. Infant and child mortality data are already widely collected, and can easily be compared from country to country. In addition, these indicators are widely accepted by all disciplines, and in some countries they may be available by administrative regions.

VI. DATA ACQUISITION STRATEGIES

This section provides a framework for the acquisition and analysis of data which will enable A I D /LAC to assess changes in welfare indicators that may or may not be attributable to Mission programs. The term data acquisition is used instead of data collection, as data collection usually refers to primary data gathering activities. Missions have a variety of extant data collection sources at their disposal. It is conceivable that for some countries no new collection is needed or that an add-on component to an existing program will provide necessary information. For example, in countries where periodic national household surveys are carried out, the addition of a food and nutrition component may permit Mission welfare-related questions to be answered.

A. DATA SOURCES AND THEIR PROPERTIES

Traditionally, four types of data sources are commonly identified as the basis for evaluation purposes in development work. These are

1. Census data. These data are collected from all individual entities that comprise the unit of analysis. For example, population censuses measure all individuals in a population, and agricultural censuses collect data from all farms.

2 Data from routine administrative reporting systems of various sectors These data are collected regularly as part of the administrative functioning of programs. For example, in many countries weight-for-age data for all children attending preschool clinics and height-for-age data from primary school entrants are collected. Agriculture ministries commonly collect price data for staple foods, etc., and labor ministries frequently collect labor statistics.

3 Survey data These data are designed to produce population estimates of the measures they are assessing. They generally entail household interviews or observation of household behavior. They are generated by probability samples of populations.

4 Project monitoring/information systems Increasingly, projects sponsored by donors are developing their own information systems which could be, or may already be, modified to regularly collect data on food and nutrition measures. These information systems often combine elements of the three data sources above.

In order to judge the utility of indicators resulting from these data sources, several **characteristics** of the data generated must be examined.

1 Representativeness of data Historically, surveys and censuses have been billed as the best source of data with respect to representativeness. Surveys are designed to generate results that are representative of the population. If survey sample designs are consistent with the study populations that Missions wish to monitor, DHS surveys represent the single most

accurate data source. However, routine reporting systems can be relatively representative of the populations Missions wish to measure. For example, where the health care system has high coverage, as in Chile and Costa Rica, nutritional status trends from clinics may well reflect population change. Whether clinic-based data may reflect population status when coverage is not high appears to be questionable. The representativeness of clinic data must be evaluated on a case by case basis. More importantly, it is essential to define the population groups for which representative data is desired. If the objective of evaluation activities is to monitor changes among vulnerable groups, then routine reporting systems of programs that serve these groups may provide reasonable evidence of change (see discussion of evaluation questions below). Finally, the annual height censuses undertaken in primary schools provide good representativeness for an indicator of welfare in many LAC countries. However, in countries having high proportions of indigenous populations, this indicator may not be adequately representative given the poor school attendance of this population group.

2 Accuracy of data Routine administrative systems are notorious for poor data quality. This is particularly the case for health sector-generated nutritional status data. Unfortunately, in most countries, the quality of data is unknown. Data quality is determined by the accuracy of actual measurement (of weight-for-age, for example), as well as recording, summarizing and transmitting data. It may also be affected by the methods an organization uses to aggregate data as it flows up the chain from the source of primary collection (e.g. clinic) to the central destination (e.g. office of statistics). Survey data may also contain inaccuracies

depending on the methodologies used to elicit information and the skills and training of the survey team

3 Periodicity of indicator data Censuses are usually undertaken infrequently. Routine reporting systems often provide monthly, quarterly or annual estimates. Some permanent survey programs may generate welfare statistics every six months, and some routine systems may only generate annual summaries. Routine project reporting systems can be designed to generate estimates according to almost any periodicity desired.

4 Timeliness and appropriateness of data processing and analysis Historically, it has been assumed that survey data are less readily available than are data from routine service statistics. Microcomputers have virtually eliminated this difference. By using standard data collection instruments and analytical software, the results of DHS surveys are now made available and reported shortly after data gathering. By contrast, in many countries routine service data are more than a year out of date.

5 Ability to disaggregate data This is an extremely important attribute of indicator data. Census data and service statistics in principle permit a great deal of disaggregation. Census data can be disaggregated by any geopolitical/functional group classification, however, census collection agencies are usually reluctant to release disaggregated data. Surveys must be designed to allow disaggregation by desired geopolitical/functional group criteria. The disadvantage of surveys is that the total number of individuals/households to be measured

(sample size) increases dramatically with the number of factors by which data disaggregation is desired. For example, data from DHS surveys that measure approximately 5,000 households generally can only be disaggregated to second order administrative units (usually the equivalent to provinces or regions). An inventory of the sources of welfare information currently available in the region (i.e. census, periodic household surveys, ongoing routine information systems), including the type, periodicity and quality of data being collected, is of utmost importance. Specifically, inventory of this type should be conducted in each country before decisions are made about data gathering data for testing and formal use of the indicators proposed here.

B. CRITICAL ISSUES IN DATA ACQUISITION

There are five major parameters that determine which approaches Missions should take to acquiring data:

1. The specific questions being asked

Data collection activities are first and foremost determined by the type of questions that are to be addressed by the data. For example, answer the question, "Has the welfare status of country x improved during the past five years?" would have different data requirements than would the question, "Has the A I D Mission program improved social welfare during the past five years?" This in turn would demand a different strategy than the question, "Has an agricultural project resulted in welfare benefits to the target population in the past five years?"

The last two questions would imply an attribution statement. Each of these questions requires the establishment of expected changes in indicators and the establishment of "comparisons", that is, changes over time in the target population and/or differences between populations that are covered and not covered by a given program/project. Project evaluation may best be addressed by combining these two approaches to attributing a difference in indicators to the specific project (for example, looking for both differences in nutritional status between project and non-project participants, and changes in the nutritional status of the target population over time).

Mission portfolios usually contain both project and non-project assistance. The former tends to be more amenable to welfare impact evaluations with appropriate attribution (it is often restricted to well defined populations or geographical areas), provided that either other projects are not implemented in the same population/area or A I D project inputs are clearly identified and quantified. The problem becomes considerably more complex when evaluating the welfare impacts of the entire Mission portfolio or programs/projects with less clearly identified geographic coverage, or when other programs are implemented in the same area or population, as it is frequently the case. In the LAC region, at least until recently, there have been improvements in nutritional status in a number of countries (Sanghvi and Mora, 1991), thus in those cases it is unlikely that changes in welfare indicators alone will address the question of whether Mission policies or programs have had a direct or indirect impact on welfare outcomes. In this case, it is preferable to identify groups that are expected to be affected by Mission programs and those that are not. For example, some Missions may have strong regional focus. A variety of sectoral programs may be focussed on a population that is limited geographically. Comparisons could be made between target regions and non-targeted regions. Additionally,

monitoring different functional groups over time would provide evidence of the distribution of benefits

2. Cost

Related to the conceptual issues of data acquisition discussed above, the cost of data collection is an important determinant of the choice of strategies. Our argument is that the difference in cost between alternative data collection strategies is diminishing. Historically, undertaking population-based surveys and the establishment of routine reporting systems in programs were very costly. This was because information systems technology and expertise was lacking in developing countries. Survey research and monitoring systems required substantial external resources. This situation has changed dramatically for two main reasons. First, in most LAC countries survey capacity already exists, as many countries have developed considerable applied research infrastructure. Second, data processing and analysis costs have diminished by several orders of magnitude with the development and diffusion of microcomputer technology. At this time, in most countries, external assistance may be required for analytic activities, but most routine processing and analysis can be accomplished with limited external resources.

3. Time constraints and frequency needs

Like cost, the time required to collect, process and analyze information has diminished greatly. Population-based surveys, the most time consuming data collection approach, can now be collected, processed and analyzed within six to eight weeks. Surveys are disadvantaged in that they are discrete information collection activities. It is generally not feasible to collect information via survey more than once a year, less frequently may be more realistic. For more real-time tracking, monitoring systems or other routine data collection systems are preferable.

4. Expected changes in welfare indicators

It is important that data acquisition strategies take into account the magnitude and direction of the changes in welfare indicators that are expected as a result of A I D policies and programs/projects. Our review suggests that the linkages between policy/projects and welfare indicators are complex. It is possible that some interventions will result in equitable distribution of benefits only after a considerable lag time. In addition, there is increasing evidence that single projects may impact certain dimensions of welfare differently. For example, recent evidence is accumulating that the reductions in mortality from child survival programs are often not paralleled by reductions in morbidity and malnutrition, and the surviving children may actually contribute to an increase in the prevalence of malnutrition (Rogers, 1991). The temporal relationship and differential impacts are only beginning to surface as important

considerations in international development program evaluation literature Missions must be cognizant of these issues when planning data acquisition activities

C. APPROACHES TO COLLECTING, ORGANIZING AND ANALYZING DATA

Missions can and should use a variety of approaches to data acquisition Extant routine reporting systems can be used for two main purposes First, policy performance indicators can be monitored to a limited extent through routine data such as prices, production estimates, labor statistics, etc Second, nutritional status data available from clinics and schools can be used to assess rough trends in these indicators Nutritional status data can be disaggregated by geopolitical criteria and even by some economic criteria (for example, urban marginal neighborhoods can be compared to better off urban areas) to provide a rough idea of trends in population nutritional status

In many cases, although routine data are collected, limited external assistance may be required to make these data available in a timely and interpretable fashion This may entail technical assistance and, in some cases, a limited allocation for the purchase of software In many LAC countries, large-scale household survey programs are already in place, including permanent household survey programs sponsored by the World Bank These programs collect a large battery of welfare measures, and in some cases anthropometry is also collected

The Demographic and Health Survey (DHS) program also provides an opportunity to collect the recommended indicators data Although DHS represents a single cross-sectional survey, the work that is performed to establish the survey sample can be used for follow-up

surveys. This work represents a substantial investment. A welfare module could be added easily at low marginal cost, and the sample expanded. A number of the most recent DHS surveys have included anthropometric indicators for children 3-36 months of age. It is recommended that Missions consider a household survey program if none exists. The cost of each survey is expected to be less than U.S. \$100,000, and most countries already have the resident capacity. Annual or bi-annual periodicity is recommended.

Another area of Mission intervention is to assure that projects include welfare monitoring systems so that at least time trends in changes in welfare indicators can be monitored among targeted beneficiaries. In some cases, projects contain some measures of population impacts, but in many cases they do not. Information systems can easily be designed for agricultural and health projects, for example, that permit evaluation of welfare impacts. Finally, data must be summarized and analyzed in a manner that permits inferences to be drawn related to the questions Missions are asking. Analysis has been the weak link in most monitoring activities. Basic descriptive reports can be generated that examine time trends in the LAC welfare indicators and that relate LAC welfare outcomes with performance and intermediate indicators. Data that are generated from routine reporting systems will probably require some smoothing, and the application of basic time series techniques.

Over time, Missions probably should acquire in-house analytic capability so they can organize and effectively use the various data sources related to Mission performance in relation to welfare (and indeed broader issues). The linkages of policy and programs in various sectors to welfare is indeed not well understood. Insightful analysis of these relationships requires a high degree of analytic training and professional development experience. Information systems

technology, especially Geographic Information Systems (GIS), is opening greater opportunities for clarification of these linkages. GIS permits the presentation and analysis of spatial data, therefore, it is a useful tool for organizing and analyzing information from a variety of Mission projects that may entail different but overlapping geographic boundaries. This technology also permits the integration of environmental/physical data with social data, therefore expanding the possibility of analyzing the determinants of social welfare.

In order to begin to effectively acquire, analyze and use welfare indicator data, as well as in field testing of the indicators here proposed, Missions will probably need to be assisted. Several specific steps need to be taken:

1. An inventory of existing data sources needs to be developed, including a description of the types of data sources, population coverage, quality of information, periodicity and lag time to reporting. In addition, an analysis of survey data collection and analysis capability should be completed.

2. Discussions with Missions about the options for installing development information systems, including low cost and more advanced alternatives. This should also include orientation of Mission staff in the interpretation and use of analyses of indicator data.

3. Development of a workplan for making available welfare indicator data and for effectively incorporating this type of information into Mission planning activities. Both the LAC Health and Nutrition Sustainability and the FNMP projects can be of assistance in providing necessary technical assistance. In the event that the Bureau is particularly pressed for immediate data on LAC indicators, it would be possible, during a technical assistance visit to assemble and report available data.

VII. RESEARCH NEEDS

In order for A I D /LAC to effectively and efficiently use welfare data to improve development programming in the region, several areas of research should be pursued

A. RESEARCH RELATED TO PROPOSED INDICATORS

The review has identified the best set of proxy measures at the individual and household level that are believed to be fail safe. This group of measures is sensitive and specific to welfare changes. Each of the measures proposed are moderately difficult to collect. These indicators, however, have been validated by the literature, whereas other more readily available macro indicators have not.

Very recently investigators have begun to examine alternative indicators of welfare. That is, simple proxy measures that can be very easily collected. Haddad et al (1991) have begun to test the utility of simpler indicators. Similar investigations are merited here, with the inclusion of dynamic indicators of welfare change. A severe limitation to this testing is that very few data sets exist with the types of time series information necessary to track changes over time. The IFPRI data used in the Haddad analysis are all cross-sectional. Time series data, including some of the intermediate variables identified in this review, should be collected along with the proposed more direct indicators in order to examine the relationship between distant and immediate indicators over time. This analysis may help identify a more efficient set of welfare

indicators. Currently, too little is known to recommend a set of distant indicators for systematic collection for policy and program evaluation purposes.

In addition, more research needs to be done relating aggregate economic indicators to measures of social welfare. It may be that some aggregate indicators or combination of indicators do a reasonable job of proxying welfare. No existing ecological study was found that relates prevalence of malnutrition, child/infant mortality and the variety of aggregate social and economic indicators commonly used in development literature. This type of study is timely as there is a growing number of countries that have undertaken population-based surveys (DHS, LSMS, etc) that collect child and sometimes adult anthropometry and mortality data.

With respect to anthropometry, further investigation is needed to confirm that child anthropometry is the best proxy for community nutritional status. Data on adult status are rare. As more information becomes available (INCAP, DHS) re-examination of the validity of using child status will be possible. Clearly, extensive research on distant (aggregate and intermediate) indicators and their ability to track welfare changes is needed. Data collection seems to have proceeded much faster than data analysis in this area. Efforts should be made to construct time series macro and intermediate data sets and use them to analyze changes in whatever existing direct indicators.

B. APPLIED RESEARCH RELATED TO A I D./LAC OPERATIONAL NEEDS

In order to improve the "state of the art" in the area of using direct welfare and food security measures to monitor USAID interventions at all levels, the following types of research are needed

1. Goal definition and objective specification

This becomes of primary importance when impact evaluation is considered as a major goal. It is suggested that A I D /LAC dedicate some efforts to the specification of quantifiable individual country and project impact objectives as they relate to congressional mandate. This should be combined with an "information audit" activity whereby the key data used for decision making with regards to resource allocation is specified and detailed. Such research, while of the management formal organizational type, is key to understanding with greater clarity the mandate and specific objectives of USAID and the types of data that are currently being utilized and their relationship to budget cycles and other fail-safe decision points.

2. Assembling a descriptive impact oriented data base

Although PRISM is attempting to address these issues, it is unclear if it will evolve towards the needed "impact" oriented data base suggested by this report. There are numerous

methodological and presentational issues which require some level of further investigation to resolve Operational issues include

- i) Standard formats to be used for impact, as opposed to process, evaluations and their relative costs
- ii) Methods to integrate new technology into presentation and reporting of impact monitoring
- iii) Appropriateness of current national level boundaries for monitoring sub-national populations who are food insecure or vulnerable
- iv) Discussion of whether projects should have well defined and distinctive target populations whose demographic characteristics are known
- v) Determination of within and between country differences in the LAC setting great enough to require different methodologies or approaches from site to site
- vi) Access by AID senior management to basic descriptive information regarding project impact at individual and aggregate levels in time to make decisions regarding resource allocation

Finally it is recommended that A I D /LAC, to the extent possible, acquire existing data relating to welfare indicators for secondary analysis In fact, some of the above questions might be addressed through analysis of existing survey and surveillance data

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Appendix A

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- D PROGRAMS TO PROMOTE PRIVATE SECTOR DEVELOPMENT
- E NATURAL RESOURCE MANAGEMENT, FORESTRY AND CONSUMPTION RELATED WELFARE

This appendix summarizes some of the evidence related to the relationship between aggregate economic growth and welfare outcomes as well as the impacts of specific programs of interest to the LAC Bureau on different indicators of welfare. The majority of these studies of specific programs focus on Latin America, though examples from Africa and Asia are included. The four types of programs included are (1) policy reforms to promote export led growth (structural adjustment), (2) diversification and commercialization of agriculture, (3) assistance to small businesses, and (4) natural resource management.

A. AGGREGATE GROWTH AND WELFARE

The relationship between levels of poverty and economic growth has been widely studied by economists and other social scientists. Growth is acknowledged to be a necessary precondition for the reduction of poverty, yet by no means a sufficient condition.¹ Only under certain very specific conditions or over long periods of time can aggregate economic growth be expected by itself to reduce poverty (Bhagwati, 1985, Stewart, 1985). Kuznets (1955, 1963) originally advanced the hypothesis that as GNP grows, inequality first increases and then decreases, i.e., that inequality follows an "inverted U shape". Since Kuznets, numerous empirical analyses have examined the issue, and have generally confirmed his hypothesis.² Adelman and Morris (1973) found not only that inequality increases during the early stages of

¹That is, growth is needed in order to alleviate poverty, but growth does not in and of itself guarantee that poverty will be eliminated.

²Chenery and Syrquin (1975), Ahluwalia (1976, 1986), Griffin (1989) and Stewart (1985) are only a few examples finding that poverty reductions do not automatically follow from aggregate economic growth. See also the studies by Paukert (1973) and Cline (1975).

economic growth, but also that the incidence of poverty may grow. This second hypothesis has not been as well borne out by empirical investigations,³ but it is well established empirically that growth and increased inequality can go hand in hand.⁴

The mechanism causing the growth/inequality relationship is that economic growth tends to be driven by dynamic "leading sectors." Income and employment usually grow in these sectors, while "following sectors" lag behind. As development proceeds, laborers move from low wage agricultural jobs to higher wage industrial jobs, this process results in increased inequality. As early adopters in agriculture reap the benefits of increased yields before product prices fall, the relative position of late adopters, those with credit constraints or insecure tenure, decline. Declining food prices in rural areas eventually benefit all consumers, even the late adopters who saw their earnings fall.

In the long run, many of these forces tend to reverse themselves. Leading sectors mature and other sectors gain, often stimulated by income-induced growth in demand. This "trickle down" effect of income-induced growth is an extremely long-run phenomenon (Ahluwalia, 1985). Because of this, many countries supplement growth-promoting policies with interventions designed especially to reduce poverty (Glewwe and van der Gaag, 1988).

It is now widely accepted that GNP growth does not necessarily alleviate poverty. "A key conclusion of the World Development Report 1990 [this annual World Bank publication

³ See Ahluwalia (1976) for example.

⁴ At the same time, there is very little evidence that increased inequality necessarily must accompany growth. Redistribution with Growth (Chenery, et al 1974) showed that the redistribution of incremental incomes in a growing economy need not slow aggregate growth. Bourguignon (1991) showed that poverty reduction can be achieved at a minimal cost to aggregate growth. Under very adverse conditions of GNP growth, however, poverty alleviation can discourage growth. In addition, significant reductions in poverty can be achieved at very modest costs (Streeten, et al 1981).

focussed on the continuing problem of world-wide poverty] is that economic growth does not translate automatically into comparable improvements in such non-income measures of the poor's well-being as life expectancy, primary school enrollment, and so on" (Squire, 1991, p 180) There is, however, evidence that specific government actions can tighten the relationship between income growth and poverty alleviation. Poverty has in fact been reduced most successfully (even during the 1980's--a decade of extremely unfavorable international economic conditions) in countries that pursued growth paths which created productive opportunities for labor and invested in the human capital of the poor (World Development Report 1990)

Experience indicates that a number of growth/inequality scenarios can emerge. Taiwan and Korea, for example, are two countries that began with a relatively unequal income and asset distribution and achieved very high rates of growth. This growth (especially in Taiwan since 1968) created increased equality and reductions in poverty.⁵ Mexico, Brazil, Peru⁶ and Malaysia are examples of fast growing economies that have become less equal over time (Streeten et al, 1981). Absolute poverty may also increase or decrease with fast, slow or stagnant growth, the evidence varies.

The uncertain relationship between aggregate economic output and equity and welfare has been documented for numerous LAC countries. In Guatemala, the economic growth experienced during the 1970s did not translate into benefits for all segments of the population (They, et al 1988). The economic growth in Honduras during the 1970s did lead to improvements in some, but not all, indicators of social welfare. Macroeconomic policy distortions (particularly the

⁵See Suh and Williamson (1987) for a discussion of how Korean economic growth reduced poverty

⁶The period of reference is the 1960s and 1970s, Mexico, Brazil, and Peru have all stagnated to some degree in the 1990s

overvalued exchange rate) largely prevented the benefits of growth being shared by all (Kritz et al,) In Costa Rica, because of large quantities of public spending in the area of health, nutrition and other social services, the economic growth of the 1970s increased equity and reduced poverty (Newton et al, 1988) Similarly, both the 1981-1982 Costa Rican recession and the economic growth that followed it seem to have affected all socioeconomic strata equally (Jimenez and Cespedes, 1988) Urrutia (1985) reports that poverty alleviation accompanied economic growth in Colombia, where the GINI coefficient, a measure of income inequality which in theory may range from 0 (perfect equality) to 1 (extreme inequality) fell steadily from 0.57 in 1964 to 0.45 in 1988 (Londoño, 1989)

B. STRUCTURAL ADJUSTEMENT (Macro-economic Policy Reforms to Promote Export-led Economic Growth)

The 1980s were characterized by numerous shocks to the economies of developing countries. Declining terms of trade for primary commodities, high levels of external debt that constrained access to international finance and placed stress on exporting sectors, and increased interest rates on foreign debt created an unfavorable international environment. In many countries, macroeconomic imbalances such as overvalued exchange rates, protectionist pricing policies, and large fiscal deficits compounded the problems. Some countries, because of favorable pre-existing conditions and the potential for flexible adjustments were able to minimize the adverse impacts of these shocks and were able to restructure their economies and exploit the

changing economic environment (Bourguignon, 1991) Several countries in Southeast Asia were able to grow and reduce poverty despite the international recession ⁷

Other countries, particularly those in sub-Saharan Africa and Latin America and the Caribbean saw internal economic conditions stagnate and worsen during the decade Economic adjustment programs were designed to permit countries to relieve their macroeconomic imbalances and make their internal economies more flexible and responsive to external changes The main elements of adjustment packages (reduced tariff protection, devaluation, reduced public sector credit, fiscal reforms, etc) should, in the long run promote export-led economic growth by encouraging exports and making the economy more flexible Short-run outcomes can, however, include increased poverty and hunger (Pinstrup-Andersen, 1987) Numerous studies have examined the impact of these policies on the poor The impacts of adjustment programs seem to vary from country to country, and sometimes two studies examining the experiences of the same country draw different conclusions

Much of the discrepancies among those studies can be traced to the types of indicators used and their level of aggregation Some of the studies examined intermediate indicators and drew their inferences regarding welfare changes from them Others examined welfare impacts without examining the paths through which the macroeconomic forces move The summary of experience below provides some guidance for the selection of indicators

⁷Economies in South and East Asia had per capita gross domestic product (GDP) growth of 2.8 and 7.0 percent, respectively, from 1980 to 1990 During the same period per capita GDP fell by 2.4 and 0.7 percent in sub-Saharan Africa and Latin America, respectively (Squire, 1991)

Potential and Actual Impacts

As outlined in the conceptual framework, the direct ways that structural adjustment policies can affect the welfare of families are by changing prices, incomes, and spending on social services. The potential paths of impact have been carefully detailed in several frameworks for analyzing the impact of adjustment.⁸ While economic theory provides a framework for identifying and analyzing these links, the sheer numbers of these linkages and complex interactions between them make it virtually impossible to predict, a priori, program impacts (Behrman and Deolalikar, 1991). The evaluation of structural adjustment should always consider the counterfactual outcomes, the impacts of structural change on the poor should be compared to their situation had structural change not occurred.⁹

The relative prices of goods are expected to change following adjustment, and specifically prices of tradeables are expected to increase relative to prices of non-tradeables.¹⁰ Depending on the nature of these changes, they could either benefit or hurt producers and consumers. The occupational (and geographic) distribution of the poor will affect how price changes affect them. Generally, the urban poor are expected to be adversely affected by food price increases resulting from adjustment programs, while rural poor would benefit as producers (Addison and Demery,

⁸See Sarris (1990), Scobie (1989), Addison and Demery (1987) and Glewwe and DeTray (1988) for descriptions of analytical frameworks to examine the economic and social impacts of adjustment.

⁹Lack of consideration of counterfactual outcomes has tainted many analyses of adjustment programs. We must keep in mind that many of these programs were instituted during extremely unfavorable economic circumstances. Careful analysis should examine which outcomes are directly related to the adjustment program, and which are attributable to pre-existing or continuing economic circumstances.

¹⁰This outcome, of course, assumes that prior policies tended to discriminate against exports (as would be the case if the exchange rate were overvalued). This is not always the case. For example, in The Gambia and Peru, agricultural prices were supported prior to the implementation of an adjustment program, and adjustment would be expected to lower these prices.

1987) Several authors predicted that producer price increases caused by adjustment policies would benefit the poor in Latin America because the rural poor make up a large percentage of total poor (Glewwe and DeTray, 1988, World Bank, 1986)

The evidence on the impact of price changes is mixed In a comprehensive study of price changes resulting from adjustment programs in the Saharan Africa it was found that there is no universal pattern of price changes, and the effects of price changes on the welfare of the poor varied from country to country There was no systematic evidence of large welfare gains or losses from price changes accruing to rural smallholders in Africa (Sahn, 1991, Sahn and Sarris, 1991) In other Sub-Saharan African countries, food and consumer prices increased dramatically following implementation of an adjustment program(see Alderman, 1986 for a study in Ghana, and Jabara, 1990 for a study in The Gambia)

Fewer studies exist for Latin America, where the evaluations of impact of adjustment policies have chosen to look either at broad macroeconomic effects or direct welfare indicators ¹¹ Pinstруп-Andersen (1987), and Johnson and Salop (1980) found that consumers faced higher prices in Latin America following adjustment The World Bank (1988) found that urban consumers were hard hit by increased agricultural prices in Bolivia, Mexico, and Chile Musgrove (1987) noted a general increase in inflationary pressures throughout the region These price increases would be expected to induce an increased supply of food (and other agricultural products) from rural areas, and hence, increase both employment and incomes in these areas

¹¹See Eguren (1990) and Johnson and Salop (1980) for a comprehensive review of the changes in macroeconomic indicators under different policies Grosh (1990) documents a falling GDP in Latin America following adjustment Pfefferman and Griffin (1989), Pfefferman (1987), Musgrove (1987) and Altımir (1984) discuss the impacts of structural adjustment on aggregated indicators of welfare

Very few studies examined this supply response, though agricultural supply is generally thought to be price responsive ¹² Morales (1991) found that the Bolivian adjustment program, which included market liberalization, did not produce a clear improvement in the terms of trade for traditional Bolivian agricultural products Without these improvements, the forecasted benefits to rural residents will clearly not arise This example underscores the importance of examining intermediate indicators prior to accepting generalized conclusions about the impact of these programs

Incomes

Adjustment programs tend to lower employment and real incomes in the public sector (when governments try to balance budgets), the informal sectors (whose output prices tend to fall relative to tradeable sectors), and among the non-food producing poor whose real income is largely determined by food prices Producers of tradeable goods, such as foods, and their employees should benefit Numerous studies of wage and employment effects of adjustment programs have found the income of the poor declined after structural adjustment, either because of falling real wages or increased unemployment ¹³ These factors seem to be especially important in urban areas (Johnson and Salop, 1980, Sahn, 1990, Jabara, 1990, Pinstrup-Andersen, 1987, World Bank, 1986, Figueroa, 1987), though Addison and Demery (19987)

¹²See Peterson, 1979

¹³Pinstrup-Andersen (1987, 1988), World Bank (1986, 1988), USAID, 1988, and Musgrove (1987) Figueroa (1987) found that real wages fell in urban areas in Latin America during the 1980s Employment in urban areas also fell (Pinstrup-Andersen, 1987, 1988, World Bank, 1986, Musgrove, 1987, Figueroa, 1987) Once again, because of the unfavorable economic conditions, it becomes difficult to sort out the causes of these wage declines Real wages fell 40 percent in Costa Rica following economic recession and prior to the implementation of an adjustment program (Hood, et al) In Sri Lanka the real wages of the poor fell because of food price increases (Sahn, 1987)

show that appropriate policies can be designed to minimize the negative impacts on the urban poor. Boyd (1987) found that, despite government programs to cushion the impact of adjustment on the poor, both urban and rural poor in Jamaica suffered.

Other studies (Sahn, 1990, Alderman, 1991) found that incomes and wages of the poor either increased or were unaffected by the adjustment programs. These studies were conducted in countries where a large portion of the poor are farmers who benefitted from higher producer prices. Earnings of farmers and agricultural workers are expected to rise following implementation of adjustment programs. In the Gambia, institutional factors prevented farmers from reaping the benefits from improved incentives, income fell dramatically and inequality increased in the rural areas (vonBraun, et al 1990). The Economic Recovery Program instituted afterward caused agricultural prices to rise which created growth in rural incomes and more equality between rural and urban areas (Jabara, 1990). In most cases, agricultural producers and laborers benefitted from higher producer prices¹⁴, and the adjustment lowered the rural-urban earnings gap (The World Bank, 1986).

Urban workers, public sector employees and informal sector employees were most adversely affected by adjustment, especially in Latin America. Figueroa (1987) found that informal sector employment rose for women and children following adjustment, yet provided no information on changes in earnings. The World Bank (1986), Musgrove (1987) and Boyd (1987) noted increased reliance on informal sector employment in various Latin American countries. Few studies closely compared informal sector earnings with those from the formal

¹⁴ See Jabara, 1990, Alderman, 1991, Pinstrup-Andersen, 1987, World Bank, 1988. Note that in cases where the intermediate indicators--the agricultural terms of trade--remained unaffected, none of the rural income benefits arise (Morales, 1991).

sector so that the impact on incomes of this informalization is difficult to judge, though more dependence on informal sector employment implies lower earnings

The relationship between sector of employment and income or earnings is distorted when aggregate market data are used. Squire (1991) notes that when studies rely on approximate indicators of welfare (such as prices and wages), the resulting biases may outweigh the cost advantages of collecting these types of data. Squire (p. 181) concludes that "this suggests the importance of improving the capacity of countries to undertake periodic surveys of living standards."

Cautionary Comments

Because of the unfavorable world economic trends, Latin American economies were in extremely bad shape prior to institution of adjustment programs. Altınır, 1984, Behrman and Deolalikar, 1991, World Bank (1986), and Hood et al, 1988, all document downward trends in employment, wages, and incomes prior to the institution of adjustment programs. The impact of these downward trends on outcomes cannot (or have not, in general) be separated from those of adjustment itself. As Behrman and Deolalikar (1991) showed, many of the negative consequences attributed to structural adjustment in Jamaica (see Boyd, 1987, Cornia,) were, in fact, part of a secular downward trend in the variables. This downward trend existed prior to institution of the adjustment program.

Social Spending

Few studies examined the availability of health and other public services at the household level ¹⁵ Instead, most focussed on changes in levels of government spending for those services As governments slow spending to maintain fiscal balances, social programs are likely to suffer Social spending declined in most countries in Latin America and the Caribbean during the 1980s (Grosh, 1990, Boyd, 1987, Pinstруп-Anderson, 1987, 1988) These spending cuts came in the areas of health services (Pinstруп-Andersen, 1987, 1988, Pfefferman and Griffin, 1989, Musgrove, 1987, Figueroa, 1987, UNICEF,), transfer payments (Pinstруп-Andersen, 1987), and lower real values of food stamps (Addison and Demery, 1987) Real per capita expenditures on education fell during some of the 1980s for most Latin American countries (Grosh, 1990, Heller and Cheasty, 1984) Even in countries where spending for basic social services was maintained, per-capita educational expenditures fell

Grosh (1990) reported a largely unsuccessful attempt in nine Latin American countries to improve the efficiency of social spending In other countries, such as Costa Rica and Chile, basic social spending was maintained, especially for the most vulnerable groups (Pfefferman and Griffin, 1989, World Bank, 1986, 1988) In doing so, a safety net was provided against the impacts of adjustment In Costa Rica, spending programs for the most vulnerable groups of poor remained strong, though spending on education fell (Hood et al, 1988) A special program helped cushion the worse impacts of the Bolivian adjustment program (Newman et al, 1991)

In most Latin American countries, immunization rates continued to increase during the crisis (Grosh, 1990) Public investment in sanitation and clean water supplies were maintained in Brazil (The World Bank, 1986, Pfefferman and Griffin, 1989) In other parts of Latin

¹⁵The World Bank's Living Standards Measurement Survey is an example of measurement of these services at the household level (See Glewwe, 1987, Glewwe and Van der Gaag, 1988)

America public investments in health and sanitary services fell Musgrove (1987) showed that not only did direct spending on health services decline in most of Latin America, but so too did public investment in health service infrastructure The longer-term impacts of these changes are probably negative since most authors (Grosh, for example) found that existing infra-structure helped mitigate the worst impacts of adjustment

Consumption and Health Outcomes

As might be expected from the price and income trends, structural adjustment has had mixed impacts on the consumption of food and nutrients Numerous studies found that energy consumption declined, at least for some critical vulnerable groups (most frequently the urban poor) ¹⁶ Expenditures on foods fell in the Gambia (vonBraun et al, 1990), while budget shares for foods varied in different countries in Africa (Sahn, 1991)

The information available on calorie consumption in the LAC is generally aggregated data from food balance sheets or disappearance data Total calorie availability per person in 1988 in four countries--Bolivia, Haiti, Honduras and Peru--were below the 2,300 calories per person per day food security cut-off ¹⁷ Four other countries--Ecuador, Guatemala, the Dominican Republic, and Nicaragua--were within 5 percent of the cutoff point (Van Haeften, 1991) Thus, the poor in these countries are very vulnerable to economic downturns Most AID-assisted LAC countries experienced increases in per-capita calorie availabilities from 1961 to 1990 Despite

¹⁶Pinstrup-Andersen, 1987, 1988, Sahn, 1987, Figueroa, 1987, Suh and Williamson, 1987, all found lower calorie intakes among vulnerable groups In Costa Rica, the economic crisis of the early 1980s caused nutrient consumption to drop by 5 to 10 percent (Hood et al, 1988)

¹⁷The 2,300 cutoff point was part of the most recent food aid legislation (van Haeften, 1991)

this, per capita calorie availability fell in 5 of these countries during the 1980s--Haiti, Honduras, Jamaica, Nicaragua, and Peru (van Haeften, 1991¹⁸)

Van Haeften (1991) showed that, in general, decreases in aggregate nutrient availability during the 1980s in the LAC countries were proportionally much smaller than what would be expected given the magnitude of the GNP declines. Thus, while food security remains a problem in aggregate in the region, the economic hardship of the 1980s (the recession and subsequent attempts to adjust) did not have as large an impact on nutrient availability as might be expected. Without detailed data on the distribution of income and its changes, it is impossible to judge the impacts of these economic problems on the poor. Survey data (not time series) show that at various points of time and for various countries, the distribution of incomes and calories in LAC are extremely inequitable (van Haeften, 1991). Any decline in income of the poorest groups could have produced food or nutrient insecurity.

Nutritional status in Latin America seems to have been less affected by adjustment than income, wage and data on social spending might suggest.¹⁸ Even in studies finding adverse employment and wage effects, indicators of malnutrition did not show significant downturns (Grosch, 1990, World Bank, 1986). The major exceptions are in Jamaica and Peru (Boyd, 1987, Figueroa, 1987), where malnutrition did increase. In Jamaica, there were increased levels of protein and vitamin A deficiencies, and hospital admissions for malnourished children following adjustment (Allen, et al., Boyd). Behrman and Deolalikar, however, found that much of these changes were caused by a secular decline in nutritional status, independent of adjustment. In

¹⁸In the Gambia, the anthropometric indicator weight-for-age fell by 11 percent following adjustment (von Braun, et al., 1990). In Sri Lanka, short-term malnutrition (as indicated by weight-for-height) grew, while long-term stunting (height-for-age) fell (Sahn, 1987). Nutritional status improved in Korea following the institution of an adjustment program (Suh and Williamson, 1987).

Peru, the secular trends in the economy were extremely unfavorable, so it becomes difficult to conclude that adjustment caused increased malnutrition

Health status did not deteriorate significantly in much of Latin America (Musgrove, 1987) As mentioned earlier, the coverage of immunizations increased throughout the region In addition, infant mortality rates continued to decline through the decade (Grosh, 1990, The World Bank, 1988, Pfefferman and Griffin, 1989) In Peru both infant mortality and child mortality increased (Figuerioa, 1987) Costa Rica experienced a brief but serious decline in health standards (measured by infant and neonatal mortality rates) immediately after the economic crisis of 1982 Subsequent to the 1983 adjustment program, mortality indicators returned to their long-term downward trends (Hood et al, 1988)

Pinstrup Andersen (1987) provided some evidence that school achievement fell The most important impact of structural adjustment on education may be related to economic pull Grosh, 1990, World Bank (1986), and Hood et al, 1988 documented a wide-spread fall in primary school attendance rates throughout Latin America, as families become strapped for money they may begin sending their children to work instead of school Much of the increase in labor force participation in Costa Rica is attributable to school age children leaving school and seeking work (Hood et al, 1988) In many of these cases the spending and enrollment outcomes cannot be attributed solely to structural adjustment Grosh (1990) and the World Bank (1986) document downward trends in social spending and in school enrollments prior to the implementation of adjustment packages

The differences observed between the expected impact of service cuts and measured outcomes may be related to lags in outcomes The economic impact of adjustment in the region

is largely confounded by pre-existing secular trends, health and nutrition outcomes also followed secular trends. Payoffs to the investments in social infrastructure and increases in education and health spending from the 1970s were still being felt in the 1980s. Better education, particularly for women, more widespread availability of potable water and sanitation systems, and extended coverage of immunizations have resulted in some protection against the most drastic health and nutrition impacts of economic downturn (Grosh, 1990)

Castañeda (1985) found that the most important single determinant of the decline in infant mortality in Chile was the increased access to sanitary water sources around the country. Since access to these services changes only slowly, they provide a stabilizing influence on the effects of economic downturn. The negative impact of adjustment on nutritional status in the Gambia was largely linked to adverse health and sanitation conditions (von Braun, et al , 1990)

An explanation that rationalizes the observation that health and nutrition indicators have not deteriorated while social spending fell in Latin America is that much of the spending in the 1970s benefitted middle-class urban groups and not the real poor (Pfefferman, 19987). Thus, the spending cuts in the 1980s have had a stronger impact on the middle class, the nutritional and health statuses of this group are not likely to be overly sensitive in the short to medium run. To the extent that basic social spending was preserved (such as is clearly the case with Costa Rica, Chile, Bolivia, and some others), the social spending cuts should not affect the poorest groups. Grosh (1990) and Musgrove (1987) attribute the findings to problems in the accuracy of data. There is little evidence to substitute this claim, but it clearly warrants consideration

Example of Indicators and Variables

Figure 3 gives an example of the levels of indicators and variables that might be considered for monitoring welfare impacts through the economy. The performance level indicators should be selected for the specific project setting and scope and those listed are an example of several possibilities. As mentioned earlier often the effects of diminished social services are not measured at the household level. These types of measures and other qualitative measures along with the basic welfare indicators may help to identify particularly vulnerable groups and needs for targeted programming. Although there are potentially a number of other indirect effects, the principal ones suggest the importance of prices, wages/income and the distribution of resources as key ones related to welfare outcomes.

C. AGRICULTURAL COMMERCIALIZATION AND DIVERSIFICATION

A large number of studies examined the impact of policies and programs to promote the commercialization and diversification of agriculture. Many of these studies were motivated by a concern that commercialization could lead to a decline in the production of food crops, less diversified diets, increased food prices resulting from lower (national or local) food availability, fewer home-produced foods, and changes in control of income¹⁹. All of these factors could worsen nutritional status, even if incomes are nominally higher. Also, if the

¹⁹See Fleuret, Fleuret (1980) and Dewey (1981, 1989) for some examples of possible negative effects of commercialization on nutritional status. Dewey (1981, p. 151) notes that though income is increased for some families who commercialized, "income levels were not found to be consistently related to nutritional status." vonBraun and Kennedy (1986) provide an excellent review of the pros and cons of commercialization, as well as summarizing results of earlier studies.

commercialization/diversification program leads to more landlessness and larger sized farms, then the income gains from the program may be captured by a smaller number of beneficiaries. At the same time, dependence on international markets for food could lead to decreased food security and increased instability in export earnings or import bills.

The evidence on the effects of commercialization and diversification on the incomes and welfare of the poor is somewhat conflicting, though the overall impacts seem to be positive. Microeconomic studies have shown that commercialization can have a positive effect on the income and nutritional status of small-farm households (von vonBraun and Kennedy). The extent of these beneficial effects depends greatly on resource distribution (both inter and intra-family), factor markets (land, labor, etc.), and the types of policies that accompany the move toward commercialization/diversification. Dewey (1989) shows in case studies from Peru, Jamaica, and Mexico, that commercialization can have some potentially strong negative effects, particularly if expected income growth does not change. Steps can be taken to safeguard nutritional status in these cases.

Income and Consumption Effects

The majority of studies on commercialization and diversification of traditional agriculture show that these programs tend to increase the income of the poor. Studies from Africa (Kennedy and Cogill, 1987, Kennedy, 1989, vonBraun et al, 1989b, vonBraun, et al, 1991, Sahn, 1990, Lev, 1981, Rabeneck, 1982), Asia (Bouis and Haddad, 1990) and Latin America (vonBraun et al, 1989a, Hernandez et al, 1974, Dewey, 1981, 1989) all found local income to

increase subsequent to diversification programs Sahn (1990) found that inequality would be reduced by export crop diversification in Cote d'Ivoire

There are, however, some serious potential problems with diversification into export crops Some studies (Bouis and Haddad, 1990, vonBraun et al, 1991b), Kennedy) found more concentrated landholdings (and increased landlessness) subsequent to commercialization Dewey (1981) found that the benefits were unevenly distributed and project benefits frequently accrued to high-income groups There is further evidence of uneven project benefits from Jamaica and Peru (Dewey, 1989) Export cropping in Guatemala (vonBraun, et al 1989(a)), is associated with increased riskiness, and control over income in the family can be affected (Bouis and Haddad, 1990, Dewey, 1981, 1989, vonBraun, 1989b) Thus, family income usually grows in response to these programs, but negative possibilities exist and should be guarded against

Increases in farm size following commercialization caused subsequent landlessness to grow in two countries (Bouis and Haddad, 1990, vonBraun et al, 1991), and may have been responsible in other studies finding an adverse impact on income distribution (Hernandez et al, 1974, Dewey, 1989) Diversification into crops that show significant scale economics is probably responsible for this vonBraun, et al (1989(a)) note that decreasing scale economics in vegetables helped increase the equitability of the returns from diversification in Guatemala

Labor use on the farm often increased following export diversification, this increase benefits landless workers (Kennedy, 1989, vonBraun et al, 1991, vonBraun et al, 1989b, Dewey, 1989) Off-farm employment opportunities grew dramatically in Rwanda as a rural service sector became viable (vonBraun, et al 1989) Several studies found that off-farm family labor

force participation declined because of increased labor demands on-farm ²⁰ As off-farm employment fell, small farmers became more exposed to risk, since off-farm incomes tend to stabilize family earnings ²¹

The increased income found in most of these studies did not necessarily translate into increased household food consumption. Several studies noted a deterioration in diet quality as subsistence crops were substituted for export crops (Dewey, 1981, 1989, Hernandez et al, 1974), however, many of the subsequent IFPRI studies did not substantiate these findings. They generally found that increased income led to increased expenditures on foods, with much of the extra money going to higher-priced nutrients and more diverse diets (Bouis and Haddad, 1990)

A distinction needs to be made between consumption changes caused by rising food prices and those caused by rising incomes. As incomes rise, a declining proportion of expenditures are spent on food, and food expenditures may increase also, but at a slower rate. This "Engel effect" is consistent with empirical evidence and economic theory and should not be viewed with consternation.

In cases where food prices rise and less acreage is devoted to traditional food crops, the family food security may suffer as a result of the commercialization/diversification. This was indeed the case in Rwanda, and quite possibly in the two studies from Mexico ²² Several studies (see Dewey, 1989 for a summary) have shown that dietary diversity and diet quality can

²⁰This was true in Guatemala (vonBraun et al 1989(a)), Kenya (Kennedy and Cogill, 1987, Kennedy 1989), the Gambia (vonBraun et al, 1991) and Rwanda (vonBraun et al, 1989b)

²¹vonBraun, et al found increased risks associated with export cropping in Guatemala, and Dewey (1981) found it in Mexico

²²The Mexican studies (Dewey, 1981, Hernandez et al, 1974) are difficult to evaluate in this regard because they focused on diets and not on expenditures or food prices

fall as purchased foods are substituted for subsistence foods. These observations provide evidence that nutritional status should be closely monitored as diversification programs take place. While diet diversity is diminishing, it is unclear whether these changes reflect changes in welfare. If higher income households prefer market purchased foods over subsistence foods, then it is difficult to argue that changes in diets damage them. On the other hand, if nutritional status suffers as a result, then welfare has been affected.

The studies from Guatemala and the Philippines found commercialized agriculture and subsistence food production to be complementary so that some of the yield increases from the technologies associated with commercialization were translated to subsistence plots. Farmers participating in diversification saw their total subsistence production decline (because of reduced acreage), but the increases in income from commercialization allowed them to maintain their food security. In Kenya subsistence acreage was maintained by expansion into normally fallow fields.

Income Stability

Few of the studies examining export crop diversification explicitly examined its effects on income stability, even though increased exposure to volatile market prices might be expected to increase earnings and expenditure instability. On a worldwide basis, international prices have shown increasing instability (Ali, Alwang, and Siegel, 1991), though there is substantial evidence that this instability is not transmitted back to producers (Hazell, Jaramillo and Williamson, 1990).

In Guatemala, one case where instability was explicitly evaluated, increased earnings instability resulted. This was caused by the vegetable export markets being directly linked to U S markets where considerable price instability abounds (vonBraun et al, 1989a). Effective rural credit markets might help hedge against this risk, but the instability was especially troublesome. Virtually all studies found that complete specialization in the commercialized export crop was unlikely, continued planting of subsistence crops was attributed to preferences for risk reduction.

Intra-household Decisions

Nearly all the studies of commercialization and export cropping found that incomes increased as a result of the policies, but there were mixed findings relative to nutrient consumption and indicators of nutritional and health status. As is discussed further in the text, increases in family food expenditures may not necessarily lead to proportional increases in nutrients consumed by each family member, nor need these changes in nutrients necessarily be reflected by indices of nutritional status.

In Kenya and Mexico, increased incomes led to virtually no change in nutrients consumed and no measurable impact on nutritional status. In the first case (Kenya) it was found that the increments in incomes produced by diversification were not sufficient to close the calorie gaps that malnourished children faced. In Mexico, the distribution of benefits from the export orientation combined with the stagnation of subsistence food production prevented average income increases from being translated into increase nutrient consumption by certain groups.

In other cases, stagnation of subsistence production was accompanied by improvements in nutritional status

Women's roles are often decreased in the diversified crop, even in cases where they were important contributions to agricultural production prior to the change. This reduced role, when combined with increased family incomes has led to mixed outcomes. The evidence from two commercialization studies showed that women were adversely affected by commercialization. In one of these cases the nutritional status of children actually improved, while in the other it was unchanged.²³ In the Gambia, women who were the traditional producers of rice (the export crop being promoted), did not benefit from the improved rice technology, rather, the men took control of the high-yielding fields.

Summary with Respect to Diversification and Commercialization Programs

There are numerous potential negative effects of the commercialization of agriculture production, few of these negative effects have been found to be empirically important. The wide majority of studies shows that export cropping increases incomes. Among the studies cited for Latin America, three out of four found that income grew subsequent to diversification. While these income gains were not always reflected in improved nutritional status,²⁴ household food consumption (and expenditures) grew, and there were few indications of negative impacts. The income generated by export cropping itself indicates improvements in household welfare,

²³See vonBraun et al, (1989b), vonBraun et al, (1991). Bouis and Haddad (1990) found that even though women's employment opportunities declined as a result of the commercialization program, nutritional status improved.

²⁴Only one study of export cropping on commercialization found a negative impact (Hernandez et al, 1974) but the statistical validity of its findings has been questioned (von Braun and Kennedy, 1986).

independent of its effect on nutrition. In cases where income does not grow, negative dietary impacts are more likely (Dewey, 1989)

Some warnings must be understood. Virtually all studies documented increased work opportunities in the area following the program. If commercialization does not lead to these opportunities, then landless laborers could be adversely affected, especially if locally produced food prices increase. If the crop being promoted exhibits increasing returns to scale (farm size), it could lead to increasing landlessness and larger farms. These effects should be monitored especially for tree crops (cocoa, coffee, tea) and perhaps sugarcane. Export vegetables and cut flowers do not appear to suffer from these problems. Finally, disruption in family decision-making (i.e. via income control), does not seem to be widespread, though in some cases it was troublesome. Even in these cases, though, nutrition did not suffer.

In addition to the impacts of commercialization on food security, it may also lead to an improvement in the quality of life for certain segments of the rural poor. The increased incomes are frequently used to enable children to attain a higher level of education, improve housing, provide cleaner water, and improve toilet facilities. In addition the governments of these countries collect increased tax revenues that are used to help finance infrastructure projects and other social programs.

Examples of Variables and Indicators

Figure 4 gives an example of potential indicators/variables to consider in monitoring the effects of agricultural commercialization/diversification on welfare. As mentioned previously some of the research is not conclusive in describing the linkages which suggest that even more

attention be given to describing the relationships. Assuming increased levels of export crops the indirect effects center primarily around employment/income, prices and allocation of resources. Depending upon the crops there may be shifts in national and local food supplies. Although some of the basic welfare indicators are typically used to look at impacts other measures of dietary diversity, shifts in women's time, or subsistence levels may be useful additions.

D. PROGRAMS TO PROMOTE PRIVATE SECTOR DEVELOPMENT

AID has actively encouraged private sector development as a part of its promotion of export oriented growth in the LAC region. Some of this encouragement has worked through the Policy-based Cash Transfer Programs, but other private sector initiatives exist.

The evidence regarding program impacts is incomplete. These programs are similar to agricultural export diversification programs in that they tend to benefit a select group of people. They generate jobs and increased incomes for their beneficiaries, and because of the high unemployment that prevails in the region, do not displace workers, or production of other goods. Thus, wage and price spillover effects tend to be minimal.

In some cases, employment and income multiplier effects have been shown to be significant. This suggests that people in the surrounding area who are not directly involved in the enterprises benefit as the increased economic activity associated with the program creates opportunities for non-beneficiaries.

Few evaluations have examined welfare outcomes, aside from employment. It is not known, then, how these other dimensions of welfare change with respect to these programs. In

addition, few of the evaluations closely examined which groups benefit most from the program (that is, are the real poor finding jobs in these sectors?) References to changes in nutritional status are usually anecdotal or without a solid empirical base

Specific Country Studies

AID private sector initiatives in the Dominican Republic (free trade zones, non-traditional agribusiness, tourism, and micro-business formation) were evaluated by surveying a random sample of beneficiaries (Management Systems International, 1989) An evaluation of the Policy-based Cash Transfer Program for the Dominican Republic mentioned private-sector initiatives, but did not specifically examine their impacts (Jafri et al, 19989) Management Systems focussed on direct outcome indicators employment created and income It was found that more of the initiatives were effective in creating employment, but that investment in certain sectors was more effective at generating jobs for certain population groups than investments in other sectors ²⁵

The study also found a strong link between income generated by these jobs and success in meeting basic human needs People who found employment, particularly in the free trade zones, seemed to come from low income groups Children of people who benefitted from increased employment in private sectors were more likely to attend school Housing and health care was substantially better for program beneficiaries The study did not adequately examine food consumption or health and nutrition outcomes Finally, the study examined spillover effects

²⁵Specifically tourism jobs tended to be high paying, and jobs in free trade zones were frequently filled by women

(job and income multipliers), and concluded that the privatization program was cost effective. The free trade zones were most effective in generating jobs and employment.

In Costa Rica, the private sector initiative was largely driven by the Policy-based Cash Transfer Program. This provided funds for privatization of inefficient state enterprises, and the promotion and diversification of exports. The evaluation (Newton et al, 1988) of these programs focussed exclusively on aggregated performance indicators. Privatization of state-owned enterprises has proceeded slowly, while at the same time there has been a strong expansion of non-traditional exports. No measures of employment generated nor more specific welfare outcomes are included in the evaluation.

The AID-supported private sector initiative in Jamaica was part of its cash transfer program throughout LAC. The focus of the initiative was to reduce government involvement in commercial enterprises, maximize the role of the private sector, and encourage export led growth. Evaluation of this program (see Allen et al, 19889) focussed on its different elements. The government's divestment program (which was encouraged through conditionalities written into the assistance package) was evaluated solely in terms of number of state enterprises privatized. There appears to be substantial progress when measured in terms of this performance indicator. The efforts related to the role of the private sector and exports were evaluated in terms of performance and intermediate indicators (regulations removed, values of exports, and incomes, etc). Jobs created in duty-free zones were described briefly (though not quantified). Exports from Jamaica increased, as did the proportion of capital (rather than consumer) goods imported.

No welfare outcomes were examined to show who (which groups of people) benefitted from the program. The study showed, as have others (Boyd, 1987, Behrman and Deolalikar, 1991) that some social indicators deteriorated in Jamaica. Once again, it is not clear how much of these changes can be attributed to these programs compared to the overall macroeconomic deterioration the country was experiencing.

Summary

The evaluations of AID private sector initiatives focus on employment created and aggregate changes in indicators such as values of exports and values of imports. The single study that examined beneficiary-level impacts (Management Systems International Study in the Dominican Republic) concluded that, at least in economic terms, participants were made better off by the program. The concentration on performance and intermediate impacts makes it impossible to reach conclusions about the welfare impacts of these programs.

Examples of Indicators/Variables

Figure 5 shows some potential indicators/variables. Depending on the specific project strategies the indirect effects and outcomes will vary some. However, in general it could be anticipated that income, prices, and employment would change with adequate project performance. Things like expenditures on health care, dietary diversity or other qualitative measures might also be monitored in addition to key aspects of welfare.

E. NATURAL RESOURCE MANAGEMENT, FORESTRY AND CONSUMPTION RELATED WELFARE

There has been little specific research addressing environmental issues and food security per se. However, the relationships between soil fertility, land use, water, etc. are a critical part of the resource base of rural households. Relatively more conceptual and empirical research has been done describing the specific relationship of forestry to food security and nutrition. Thus, forestry and food security is used here as an example for describing possible indicators related to natural resources. Figure 6 describes the important linkages between the natural resource base, forestry, and food security. The key linkages for which there is specific information in Latin America are consumption of forest foods, wildlife, and fuelwood. The other linkages seen in Figure 6 are probable based on what is known about forestry in Latin America and on research from other parts of the world.

Relationship of Forestry and Forest Foods To Consumption

The majority of the studies done in Latin America provide an inventory of forest and wild foods according to land type or ecological zone such as in Honduras (Lentz, 1986), Panama and Colombia (Duke, 1975), and Mexico (Rico-Gray, Chemas, and Mandujano, 1991). Although these ethnobotanical approaches give limited consideration to the relative importance of these foods in the total diet, some do describe the importance of the forest foods. For example in Mexico, of the 301 different types of shrubs and trees present in the forest or garden area, 73% had at least one use. They were used mostly for medicine (69%), apiculture (39.9%), food (30%), building (18%), fuel (17%), and timber (12%).

Although food habits are not necessarily directly comparable between Latin America and Africa, research done in Africa may provide some insights on potential contributions to the diet given the similar levels of availability in Latin America. For example, in Swaziland (Ogle and Grivetti, 1985) 52% of the adults surveyed consumed 11-30 different forest related plant species frequently and considered them an important part of their diet. Other studies indicate that forest foods are important throughout the year but are considered especially critical during lean times for either food or income (Frankenberger, 1989).

In order to determine the impact of natural resource management and forestry on aspects of welfare like food consumption, changes need to be made in data collection practices. More specific information needs to be gathered in Latin America on the types and uses of forest foods and their relative contribution to the diet across seasons. In some cases, frequency of use of particular lean season wild foods may be a good proxy measure for nutritional vulnerability. With more applied research other simplified measures may emerge as useful proxies.

Forestry, Wildlife, and Food Security/Nutrition

For Latin America most primitive groups rely heavily on wild game as a source of protein (Devos, 1975). Animals such as rabbit, tapir, armadillo, etc. are used. For one area of Brazil 21 different types were listed as being used with six types being the most common. More detailed research has been done on the relationship of forestry, wildlife, and food security in Africa. These studies indicate the important contributions of different types of wildlife not only for food consumption but also for other household and community uses (Dwyer, 1985, den Hartog and de Vos, 1973, Malaisse and Parent, 1982, Martin, 1983). Although it is suggested or assumed in these studies that deforestation contributes to declines in wildlife, none of the

studies examined the relative changes in forestry and wildlife over time. There is certainly a need for more research to describe the impact of changes in forestry and the natural resource base and how that affects wildlife and, hence, household income and consumption.

Fuelwood Availability and Food Security/Nutrition

With deforestation and diminished supplies of fuelwood households make adjustments in the distribution of labor and in food habits. Much of the research on these areas has been completed in Africa. It indicates that when fuel is scarce women cook fewer meals and cook different foods that may be less nutritious (Cecelski, 1984). "Fuelwood scarcity may affect the amount of food prepared, the quality of food processed, the kinds of foods consumed, and the time available to women for cash-income earning activities " (Cecelski,1984)

Other research conducted in Nepal (Kumar & Hotchkiss, 1988) found that women's work loads increased with deforestation. They spent longer times traveling and more time in the sparser woodlands. They had less time for agricultural work and for food preparation and food processing. Although there is limited information available on fuelwood in Latin America it would be important to gather data on the relationship of fuel wood availability to household welfare.

Summary

Important relationships appear to exist between the natural resource base, forestry and measures of household welfare such as food security and nutrition. In order to more effectively monitor the impacts of programs and policies there is a need for specific information on the linkages between the natural resource base/forestry and food security or other aspects of welfare.

Studies tend to focus either on the forests or on consumption but longitudinal studies are not readily available nor those that consider the shifts in the allocation of resources with different levels of deforestation

Figure 7 presents an example of some of the types of variables or indicators that might be considered for monitoring. As previously noted, the performance variables are strategy and project specific. Indirect employment and food availability effects would be anticipated as well as increased levels of trees and forest products. More qualitative measures like the amount of time women spend in fuelwood collection or the number of forest foods used across seasons would supplement the more basic welfare measures.