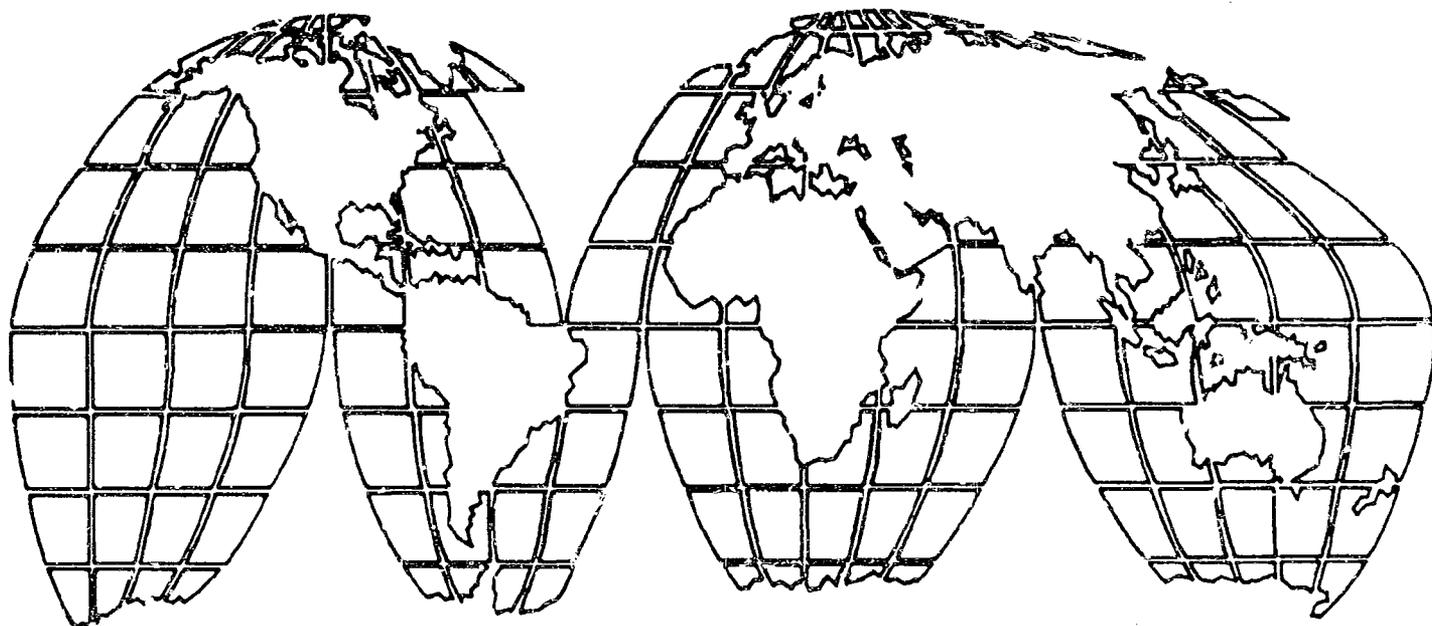


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Sustainability of U.S.-Supported Health, Population, and Nutrition Programs in Guatemala: An Economic Analysis (1942-1987)



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Sustainability of U.S.-Supported Health, Population,
and Nutrition Programs in Guatemala, 1942-1987: An
Economic Analysis.

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1. PURPOSE AND CONTEXT

This appendix extends and amplifies the review and analysis of the economic factors presented in the main report and in individual case studies. This appendix also pinpoints some of the difficulties encountered by the evaluation team in applying particular definitions or concepts to their case study. It also highlights several methodological advances that have taken place since the study of health project sustainability was conducted previously in Honduras.

The insight and experience gained through this evaluation should be used to further refine our knowledge of the factors affecting sustainability so that future sustainability studies will have a more exact methodology on which to base their evaluations. Thus, the second major purpose of this appendix is to provide some guidelines on how future studies might best use information on economic factors and sustainability. These guidelines consider not just the nature and timing of activities of the investigating team, but also the problems concerning the availability and reliability of data-- a problem that increases with the length of time under investigation. The present study analyzes projects that were initiated as many as 45 years ago, which suggests that problems with data quality and consistency may be substantial.

The Ministry of Health is responsible for providing health care services to the entire Guatemalan population, although other agencies (in particular, the Guatemalan Social Security Institute [IGSS]) serve certain segments of the population. Eligibility criteria for receiving health care treatment from these other groups are such that the population relying exclusively on the Ministry of Health (about 70 percent) have lower employment rates, less education and income, and lower access to potable water and sanitation facilities. Predictably, they have proportionately greater health care needs and less ability to pay for services. The effects of changing economic conditions on Ministry of Health clientele and on the service delivery system required to meet their needs are pronounced.

Economic conditions are important design and evaluation constraints at both the beginning and the end of projects. The structural characteristics of the economy as well as its overall state should be considered in project design and evaluation. Although it is important to have good descriptions

of these factors to support project design and evaluation processes, in the final analysis, the value of economic studies lie in being able to predict the responses of individuals and groups to these conditions and characteristics.

Section 2 provides a general overview of the evolution and performance of the Guatemalan economy over the last four decades and identifies key events and periods that warrant special attention in project reviews. A.I.D. policies and programs have been instrumental throughout this period, and USAID Mission involvement has included not only the health field, but education and agricultural development as well. Section 3 lists some of the hypotheses related to the economic environment considered in this study and applies them to the specific program areas and projects examined in Guatemala. Section 4 considers the implications of these findings for future assistance programs in Central America and elsewhere, identifying actions that can be taken to improve the quality of economic analysis and its integration of economic analysis into retrospective project performance evaluations.

2. OVERVIEW OF THE GUATEMALAN ECONOMY

Excluding bilateral assistance from the United States and other donors, Ministry of Health funding comes from Government budget allocations (85 percent); loans, primarily for construction (13 percent); and user fees (2 percent) (World Bank 1986). The Ministry exercises relatively little control over these sources; its level of funding is heavily dependent on the performance of the domestic economy. Agriculture, which historically has dominated the Guatemalan economy, currently accounts for more than one-fourth of annual domestic output. A.I.D. and predecessor agency activities over the 1942-1987 period have also had a great bearing on the present composition, characteristics, and capabilities of the Guatemalan economy. Various projects have promoted export crop diversification, introduction of new agricultural technologies, resettlement of landless farmers on public lands or properties acquired by a variety of means (some of them of questionable propriety), and infrastructure modifications, particularly expansion and improvement of the road network.

A multilateral program to eradicate malaria was also supported intermittently from 1958 to 1970. The program helped open large areas of fertile land to cultivation and further magnified the significance of the agricultural sector to the overall economy. During the 1970s, A.I.D. projects emphasized small-scale agriculture and the development of cooperatives in rural areas. A \$23 million loan helped revamp the entire public agricultural sector, fortifying the Ministry of Agriculture and streamlining small-farmer access to credit.

Guatemalan primary product exports include coffee, cotton, sugar, meat, cardamom, and bananas. The majority of Guatemalan's export sales are to the United States (35 percent) and the Central American Common Market (20 percent). Basic imports include fuels and lubricants, industrial equipment, motor vehicles, and raw materials such as iron and steel. The United States accounts for 37 percent of this trade directly. Until recently, the Guatemalan quetzal was strengthened by this significant market relationship with the United States and traded at par with the dollar.

Inflation has been a serious problem only in the last few years, with annual increases in the consumer price index soaring from virtually zero to about 37 percent between 1982 and 1986 (see Figure G-1). However in 1972, some two decades of stable prices were disrupted by a variety of factors, including the deteriorating performance of the closely associated U.S. economy, emerging difficulties in the Central American Common Market, and the institution of a number of Government reforms and initiatives that were expected to have inflationary effects for a period of time. These factors led to a decade of sustained annual price increases of about 10 percent. The Government enacted severe austerity measures in 1982, resulting in sharp cutbacks in public spending in 1982, 1983, and again in 1985. Figure G-2 shows how this reversed an apparent trend in the years immediately before these restrictions toward greater public health expenditures. (Much of this increase, however, was due to a wave of construction activity and may have produced little real increase in service levels.) Although these austerity measures produced an immediate salutary effect, they were clearly not enough to keep the genie in the bottle, and the 1983 devaluation of the quetzal added further pressures to already escalating price levels.

In aggregate terms, the Guatemalan economy grew briskly (if erratically) from 1950 until 1978, when a sharp and sustained downturn began that still severely affects the welfare prospects of this country (see Figure 3). This growth resulted from increased agricultural output, in great measure a product of the opening of large amounts of fertile land to cultivation as a result of the malaria eradication program, and from a program of economic diversification emphasizing industrial development, also benefiting greatly from A.I.D. financial and technical participation. During the 1950s, the regionwide downturn produced by the banana strike of 1954 was followed by a dramatic surge in investor confidence and external assistance after the military coup rolled back social reforms that had taken place in preceding years, producing a real growth of more than 9 percent in 1956.

During the 1960s, participation in the Central American Common Market brought substantial benefits to the domestic economy, which carried over into the early 1970s. Although evidence suggestive of structural weakness emerged in 1973-1975, the wave of international assistance following the devastating 1976 earthquake seems to have bought a 2-year reprieve from the impending recession. That the bottom fell out of the Guatemalan economy in the early 1980s is not news--the recession was worldwide. But the Guatemalan recession has lingered, despite surprisingly strong showings over the preceding 30 years; for example, real economic growth averaged 3.8 percent annually during the 1950s, 5.5 percent in the 1960s, and even improved to 5.7 percent in the 1970s, despite the serious problems encountered late in the decade.

A major obstacle to restoration of economic prosperity has been the underutilization of human resources because of the composition and characteristics of the labor force. Fully two-thirds of the economically active population has had 3 years or less of formal education, which greatly restricts the job opportunities open to them. Mechanization has reduced demand for labor in the traditionally dominant agricultural sector, and the rural population is ill-situated and ill-prepared to undertake other kinds of productive activities. Rural inhabitants, who comprise some 63 percent of the total population, are poorer, and less educated than the urban population, and the rural indigenous population is generally worse off than are rural ladinos.

Unemployment and underemployment rates are closely related to private investment levels and to world market prices for Guatemalan primary product exports. Capital flight beginning in the early 1980s and export reductions helped produce a combined under-employment and unemployment rate of about 45 percent of the labor force, and these factors are only now beginning to turn around somewhat.

Figure G-3 suggests that the economy is volatile (a common feature of agriculturally based economies) and that per capita gains have not been as pronounced as aggregate gains. Figure G-4, however, paints quite a different picture. From a low point in 1955, real output per capita increased steadily through 1980, when it was 90 percent higher than in 1955, despite a near doubling of the population. This increase in real per capita output means that the potential standard of living had almost doubled between 1955 and 1980 for more than twice the number of people. (Of course, these gains were not shared equally: today, the richest 20 percent of the population receives more than 54 percent of the income, where as the poorest 20 percent receives less than one-tenth.) The economy definitely appeared to be on the upswing, for Guatemala, but within 6 years, real output per capita had lost more than one-fifth of its value, and there were over a million more mouths to feed.

Overall budget constraints (i.e., the public sector's share of GNP) and the distribution of resources within the public sector (see Figure G-5) are the two basic elements underlying the set of economic hypotheses concerning sustainability that were developed in this study. Figures G-5 and G-6 provide an indication of relative priorities as evidenced by shares of resources provided for health and other public sector programs. Figure G-7 shows annual changes in relative priority for the Ministry of Health.

The public sector in Guatemala has been quite small, averaging about 12.5 percent GNP between 1966 and 1986. Although the Ministry of Health's share of public expenditures (8.3 percent) was generally in line with health spending in the Central America region, its share of GNP was uncommonly low at about 1 percent annually (Figure G-8). Factoring in the efforts and expenditures of other public and private institutions, a mere 1.7 to 1.8 percent of GNP goes to improving health care conditions in Guatemala annually, despite abysmal conditions in many areas that could easily be avoided or improved using existing, low-cost technologies and techniques.

Surprisingly, average annual real growth rates in total public spending (9.4 percent) and health care expenditures (9.1 percent) both far outstripped economic advances during the peak growth decade of the 1970s (see Figure 6). However, the decline in real growth since 1980 has disproportionately affected the public sector. As economic growth declined by an average of 1 percent annually, total public spending declined somewhat less (-0.6 percent), while the Ministry of Health experienced a real decline in its purchasing power of more than 4.6 percent. (If the exceptional post-election, post-devaluation figures for 1986 are omitted, Guatemalan Government spending dropped an average 6.5 percent and the Ministry of Health spending dropped 10 percent from 1980 to 1985.) Cerezo acted rapidly following his election to offset these declines, but many doubt the ability of the economy to absorb the changes proposed for public sector development and the willingness of the oligarchy to accept them.

Public spending and Ministry of Health spending much in tandem throughout most of the 1966-1986 period, except after the 1976 earthquake when public spending increased as a proportion of GNP while Ministry of Health spending declined as a percentage of Government spending (See Figure G-8). Because of incremental budgeting procedures and the much larger spending base of the non-health public programs, the one-sided growth gain experienced by these public programs in 1976 may well have produced an effective shift in priority away from public health care programs (also visible in Figure G-6). The Ministry of Health regained ground through 1980, but has fallen off relative to other public programs since then.

This period of growth in public spending after 1976 coincided with a rapid escalation in external loans to the health sector (See Figure G-9) and with the infusion of more than \$160 million in U.S. Economic Support Funds. Health sector loans outstanding through August 1987 totaled more than \$250 million, with Inter-American Development Bank (IDB) loans accounting for more than 80 percent of the total. What is most striking about these loans is their estimated average implied cost of a dollar as \$0.31, with a range from \$0.09 to 0.95.

These calculations were based on several simplifying assumptions:

- That the market interest rate was 10 percent for all these loans, regardless of when they were contracted (variations in the assumed constant 10-percent market discount rate would not materially affect these findings)
- That net obligations (original contracted amount less subsequent deobligations) were disbursed immediately
- That payments during the grace period were restricted to interest on the disbursed amount
- That payments following the grace period were uniform, based on the original principal, interest rate, and remaining term of the loan

In several ways, this set of assumptions actually overestimates the net present value of repayments by the Guatemalan Government. Nevertheless, these calculations suggest that the Guatemala, on average, will pay just 31 percent of the face value of the loans it has received. Surprisingly, IDB provided the best terms, providing dollars at a quarter of their value, but A.I.D. offered an impressive bargain as well, providing dollars at one-third their value. Only Canada's Central American Bank for Economic Intergration (CABAEI) required anything near a market return, and it provided just more than 1 percent of the loan funds represented here.

These developments have generated considerable concern about Guatemala's ability to finance the recurrent costs of programs being funded by these loans and grants. The concern is that well-intentioned programs and plans are effectively creating foreign assistance dependency in Guatemala. This situation is not unique to Guatemala, however. In fact, the suspension of U.S. foreign assistance to Guatemala because of persistent human rights abuses may have diminished the extent of the dependency problem for Guatemala compared with the problem in other Central American countries.

The seductiveness of foreign assistance loans is evident in the calculations described above, which imply that Guatemala pays an average of 31 cents for each dollar it receives in loans. On the surface, it would appear to be foolish to reject these loans, but other factors intervene to complicate the evaluation, particularly the recurrent costs associated with particular efforts supported by these loans, such as facilities construction projects. Many recently completed IDB-backed facilities have not yet opened their doors because of the lack of equipment and personnel to staff them. Despite this, the 1987 Ministry of Health Action Plan lists projects that will add another 7 hospitals, 7 new or expanded health centers, several clinics, and more than 130 health posts. Other loans, grants, and national funds are targeted at equipment acquisitions, but the ability of the Ministry of Health to absorb the recurrent costs of these facilities is doubtful, given its failure to adequately staff, equip, and supply existing facilities. Encouragingly, however, IDB and the Ministry of Health recently reformulated a major construction project, cutting recurrent costs by half while retaining the focus on facilities.

Although the motivation behind the use of Economic Support Funds has primarily been to alleviate balance of payments problems, these funds are increasingly being viewed as a direct substitute for counterpart funds that would otherwise be lacking. Apparently, no health sector project has yet relied on this funding source, but there is increasing pressure to do so. In that event, the national cost-absorption factor would have to be seriously reconsidered as an indicator of the sustainability of a project.

Overall U.S. bilateral assistance to Guatemala increased almost sevenfold between 1984 and 1985, from just under \$16 million to over \$101 million. Initially, direct Development Assistance increases led the way, but Economic Support Funds and PL480 Title I funds have since assumed the leading roles. From 1985 to 1987, funding in these categories increased from less than one-third to almost 70 percent of the total, and that total itself has risen some 30 percent to \$132 million.

3. SUSTAINABILITY AND ECONOMIC CONDITIONS

Several broad hypotheses concerning the relationship between sustainability and economic factors are described below and examined in the context of U.S.-supported health projects in Guatemala. The discussion and analysis of these factors are expository rather than definitive, given the deficiency of the data. Table G-1 summarizes the findings regarding these hypotheses for relevant projects. It should be emphasized that

because this evaluation ignores the interdependencies between different factors, the results should be interpreted accordingly.

¹This analysis is based on preliminary data through March 1987 provided by USAID/Guatemala.

Table G-1. Summary of Hypothesized Relations

Hypothesis	Relevant Projects	
	Supportive	Contradictory
Projects initiated during periods of economic decline are more sustainable.	Roosevelt Hospital Urban Water SCISP Health Services	Rural Water SINAPS
Projects terminated during periods of economic growth are more sustainable. Conversely, Fortification ^a projects ended during periods of economic decline are less sustainable.	Roosevelt Hospital Urban Water SCISP Health Services Malaria Urban INFOM SINAPS Nutrition Planning	Rural Water ^a Mobile Units Family Planning Rural Health/TSR Sugar Corn Hybrid
The less uncertainty about recurrent project benefits and costs, the more sustainable the project.	Roosevelt Hospital Malaria SCISP Health Services Urban SCISP Family Planning Mobile Units Nutrition Planning	
Projects ending at a time when the public share in economic growth is increasing are more sustainable.	Urban INFOM Sugar Fortification	Family Planning Nutrition Planning
The greater the number and degree of secondary benefits, the greater the sustainability of the project.	Malaria Family Planning Sugar Fortification Corn Hybrid Corn Fortification Rural Health/Rural Health Technicians	
Projects that produce immediate Technicians benefits and postpone costs are more sustainable.	Malaria Family Planning Latrines Rural Water Nutrition Planning	Rural Health/Rural Health

Table G-1. Summary of Hypothesized Relations (cont.)

Hypothesis	Relevant Projects	
	Supportive	Contradictory
Projects that rely on local markets for input are more sustainable.	Malaria ^a Roosevelt Hospital Nutrition Planning Family Planning Rural Health/Rural Health Technicians	Sugar Fortification ^a

^aThere is some ambiguity about how to interpret the information available for these cases. See the appropriate section in the text for a discussion of these points.

Hypothesis 1: Projects initiated during periods of economic decline are more sustainable.

A.I.D.-supported programs in Central America--both economic and social--are often countercyclical. Even if the domestic economy is not truly declining, heavy demands on public resources (e.g., demands originating from military conflict) can create the need for targeted assistance programs. Assuming that the health care objectives of A.I.D. and the Guatemalan Government are similar and that project selection is "rational", A.I.D. would merely be supporting initiatives that the Government itself would be interested in pursuing under more favorable economic and political conditions. This confluence of interests tends to favor project sustainability.

Also, projects initiated during periods of economic decline are more likely to be extended by A.I.D. and to undergo a scaling down of objectives. Uncertainty about future conditions and reluctance to abandon the host institution in the midst of an economic or political crisis promote extensions, while the realities of the economic situation force a reconsideration of the feasibility of particular program objectives and a decrease in their ambitiousness. We have not collected data on the number and duration of extensions for this study, nor on differences between initial and final objectives. Future sustainability analyses should consider collecting this type of information in order to examine the hypothesis more thoroughly.

For purposes of this analysis, we have identified two periods of relative economic decline: 1950-1955 and 1978-1986. Five projects were initiated during these two periods, four of them in the earlier period. Three of these projects were judged to have been sustained (Roosevelt Hospital, urban water, and SCISP health services) and two not to have been sustained (rural water and SINAPS). In the judgment of the investigators, both of these projects had excellent technical content but suffered from grievous deficiencies in the implementing institution.

Hypothesis 2: Projects terminated during periods of economic growth are more sustainable. Conversely, projects ended during periods of economic decline are less sustainable.

There are two major rationales for this hypothesis. First, and most obvious, host governments are more able and willing to take on additional fiscal burdens during periods of growth and are less able and willing during periods of decline. Second, the funding agency, as argued above, is more likely to "let go of the reins" during periods of economic advance, to the extent that the project termination date is a control variable.

Eight projects ended during the 1956-1977 period of erratic but persistent growth. Three of these projects were not sustained: rural water, rural mobile health units, and family planning. All three were troubled by poor implementation, and the mobile health units project appears to have been imposed on the Ministry of Health and was somewhat lacking in technical content. Of the five sustained projects, only the SCISP health services project faced any other serious obstacle -- again, deficiencies in the implementing institution.

No project was terminated during the 1950-1955 period of economic decline, but five were terminated after the decline that began in 1978. SINAPS and the nutrition planning project failed as expected, but the rural health technician project and two nutrition projects (sugar and corn fortification) provide contradictory evidence. The sugar fortification project effectively shut down in the early years of the recession, but has since been reactivated at the insistence of the Government.

Hypothesis 3: The less the uncertainty about recurrent project benefits and costs the more sustainable the project.

The level of detail available in the case studies is generally insufficient to put this hypothesis to stringent tests. In some instances, however, the evidence is suggestive.

Based on its own experience and international standards, the Ministry had reasonably good estimates of what it would cost to operate Roosevelt Hospital. Costs of the eradication program were rising, but they were predictable and so management could respond with the necessary internal adjustments. SCISP had a long track record of efficient administration in Guatemala, and could provide reasonably accurate cost projections for its health services activities. Each of these projects was sustained, which tends to confirm the hypothesis.

Projects that introduced activities with which the Ministry of Health had no experience, or for which future service demands were unknown were less likely to be sustained: Family planning mobile health units, and nutrition planning projects fall into this category; none of these projects was judged to have been sustained.

Hypothesis 4: Projects ending during a period when the public share in economic growth is increasing are more sustainable. And, by symmetry, the less the share in decreases, the more sustainable the project.

The only steady period of relative growth for the public sector was in 1976-1981, following the earthquake. Only two of the four projects that ended during this period were judged to have been sustained. As noted above, however, growth during this period somewhat favored non-health activities as a result of post-earthquake recuperation efforts.

Hypothesis 5: The greater the number and degree of secondary benefits (positive externalities), the greater the sustainability of the project. Similarly, the greater the number and degree of indirect costs (negative externalities), the less sustainable the project.

The malaria eradication program produced substantial health benefits for the population in malaria-affected regions while also creating the opportunity to safely and economically cultivate large, previously inaccessible areas of the country. The economic benefits to the nation were substantial, and this was repeatedly cited as one of the major reasons why The National Service for Malaria Eradication (SNEM) continued to receive substantial Government economic support following withdrawal of A.I.D. and other external support. To be sure, SNEM's relative share in the overall Ministry of Health budget declined, but the nominal levels never decreased, and they appear to have been more and more concentrated in areas that produced export market crops.

By contrast, family planning projects, while creating benefits for participants, created significant external costs for those who did not use these services, primarily for moral or religious reasons. The program provoked the emergence of a large, countervailing political force that severely weakened the program and made its sustainability within the Ministry of Health virtually impossible.

Interpretation of the projects involving the Nutrition Institute of Central America and Panama (INCAP) is somewhat problematic in respect to secondary benefits and costs. Over time, INCAP evolved from a research-oriented institution to one that is more involved in providing technical assistance. However, most of the INCAP projects in fact integrate research and technical assistance components to varying degrees. Dissemination of research results would, therefore, be considered a secondary benefit, independent of whether the project itself succeeded or failed.

The experience of the three fortification projects cited in the case study appears to confirm this hypothesis. Sugar producers immediately balked at continuing the vitamin A fortification program because of the additional costs of production. Even though costs could be passed on to consumers, the sugar producers believed that, because of the recession, they were at a competitive disadvantage with producers who did not fortify their product. These indirect costs led to suspension of the program for several years, until the modest recent economic turnaround began and the new administration determined that the indirect benefits to consumers outweighed the indirect costs to producers.

The corn hybrid project was a joint effort with Mexico and could be said to have provided the indirect benefit of improved international relations and exchange of information. At the same time, the project was reported to have improved the nutrition of workers on large commercial farms and, therefore, indirectly to have improved productivity. The corn fortification project failed because of the unacceptable taste of tortillas made from this corn--an indirect cost.

The nutrition planning project placed pressures on officials in various departments of the Ministry of Health to consider the role of nutrition in a national health policy at a time when the doctors within the system had little interest in nutrition issues. Although there is a nutrition planning unit within the Ministry of Health, nutrition specialists are scattered throughout the Ministry and lack guidance because of internal opposition.

The rural health/rural health technician program has repeatedly demonstrated its ability to provide services beyond those originally envisioned. The valuable contributions of the rural health technicians in the period following the earthquake and in reducing pressure on other levels of the health system are indirect benefits of the program, which have led other, closely affiliated health care professionals to view the program more favorably. This program was judged to have been sustained largely because of these indirect effects.

Hypothesis 6: Projects that produce immediate benefits and postpone costs are more sustainable than those with immediate costs and long-term benefits.

This hypothesis, which is derived from the economic principle of discounting, was supported by five of the six projects considered applicable to the hypothesis.

The clearest example of this principle was in the case of the malaria eradication program. The benefits of expanded agricultural output were almost immediate, whereas government absorption of the total program costs still lay ahead and the exact terms were uncertain. The health benefits resulting from the malaria eradication program were also immediate, although a failure to contract malaria may be a harder benefit to observe than an increase in agricultural output.

By contrast, the economic and social costs of public support for the family planning projects were immediate and visible, whereas the benefits of improved maternal and child health and the reduced costs of social programs associated with a smaller future population were remote and speculative.

Water supply projects generally were sustained, and they produced outputs almost immediately while the cost of maintaining the systems lay in the future. Most latrine projects failed, generally because the latrines were unsightly and culturally unacceptable, an immediately evident social cost, while the improved health status they promised was somewhere in the future and, poorly understood. The nutrition planning project forced busy managers to take time away from pressing day-to-day activities--an immediate cost to them-- to participate in planning activities that might one day result in an improvement in the nutritional status of the population. This project was also judged to have failed.

Hypothesis 7: Projects that rely more upon local markets for inputs are more sustainable.

Five of the six relevant projects support this hypotheses. Projects that were judged not to have been sustained (nutrition planning and family planning) relied heavily on external training and materials, even when those employed by the project were locals. By comparison, the malaria eradication, rural health technicians and Roosevelt Hospital projects were much more dependent on local resources.

The sugar fortification project is somewhat more difficult to interpret. Although it relied entirely on local producers, a critical ingredient --the vitamin A additive--had to be imported. Similar ambiguities arise in the malaria eradication program, which depended to some extent on imported insecticides. The program relied heavily on these imports early on, but the shift from eradication to control strategies reduced this dependency.

In the workshop that culminated the field work for this evaluation, sustainability or continuity was repeatedly linked to the degree to which projects relied on local markets for inputs. The foreign exchange factor directly takes up this

point, but does not carry it far enough. In addition to local goods markets (e.g., for PVC piping for water projects), projects can rely on a variety of local labor markets. Aside from improving the prospects for sustainability, project reliance on local labor markets can also help to develop such markets, as a result of increased demand.

Spending health sector project funds domestically adds important secondary economic benefits to the project. As long as reliance on local markets does not affect the quality or quantity of health care services delivery, such reliance enhances the sustainability of projects. For some kinds of health care projects, it may even be worthwhile to consider diverting project funds to create or stimulate local markets or industries.

4. ROLE OF QUANTITATIVE ANALYSIS

Quantitative analyses can be useful in assessing the sustainability of health projects, but it is important to understand the nature and limitations of the available data and the kinds of adjustments or adaptations that may be required. This section attempts to describe some of these problems and suggest ways of managing them in future sustainability studies.

4.1 Quality and Quantity of Information

Significant problems and limitations confront analysts who wish to conduct quantitative analyses in developing countries, especially quantitative analyses dependent on time-series data. Typically, there will be no lack of raw data. In this study, for example, we were able to get annual reports for some divisions of the Ministry of Health dating back to 1935. The problem is that there are large variations in the type of data, level of aggregation, and collection procedures employed over time. Important programmatic changes are normally accompanied by changes in the type, frequency, and quantity of data collected. There is no immediate incentive to continue collection of historic data, and time series are interrupted as a result.

Budgetary data are more reliable than most other data because of the scrutiny they receive from auditors, and from potential competitors for those funds whose interests would be served by detecting misuse or inefficiencies that would not concern auditors. Even here, however, there can be significant breaks in the series associated with explicit changes in

accounting or budgeting principles and procedures or with implicit changes in their interpretation or application. Program-based budgets provide much more detailed and reliable information for researchers, but they are often only a starting point for developing the kind of information desired. For example, development of estimates of public health sector investment levels required examination and disaggregation of as many as eight other Government accounts beyond those of the Ministry of Health.

By contrast, performance or output data are only rarely corroborated by independent sources and thus are much less reliable. Despite their discrepancies, performance data can be useful if it is safe to assume that the biases in the data are consistent over time. In many settings this is a reasonable assumption, since reporting and aggregation procedures change only very slowly in most government institutions.

Redundancy is always a sound strategy in collecting and verifying data. Because the predominant concern is generally with where the money has gone rather than what the money has done, economic and financial data are comparatively abundant, whereas performance or output data may be collected consistently only by the unit under investigation. Such data are inherently suspect. For example, the annual number of malaria cases is commonly thought to be four or five times the figures reported by SNEM. Similarly, morbidity and mortality rates as reported by outside groups are generally much higher than those reflected in Ministry of Health statistics. Errors in diagnoses are quite common in developing nations, especially at lower levels of the health system. For these reasons, it is important to identify as many independent data sources as possible, even if they do not all cover the same time periods or geographic regions. These data provide checks on one another and enable an assessment of the general accuracy or reliability of certain types of information or sources.

Even that are demonstrably inaccurate or biased can be used for analysis. Normally, systematic biases will not hide underlying trends, and the identification of trends or shifts in trends is sufficient for many kinds of exploratory analysis. Although the exact values of key parameters may remain unknown, many different types of relative analyses remain useful. Whatever the actual number of malaria cases in any year, the data collected by SNEM probably provide a reasonably accurate indication of the important periods and trends since about 1960.

As indicated earlier, consistent and intact time-series data are scarce and inherently suspect. As a rule, baseline

data suitable for evaluating the effects of a new program or organization do not exist. Initiation of these programs frequently introduces changes in the way management information is defined, produced, gathered, and handled. Thus, for example, the system for tabulating malaria cases changed drastically in 1955, and no attempt was made to maintain the old system in parallel with the new one for a period of time so that a correlation between the two series could be established. As a result, comparisons of malaria rates in the periods before and after the creation of SNEM are meaningless because the data are incompatible and incomparable. Certainly, the first 5 years or more of time-series data are of questionable reliability, as new information systems and needs associated with new programs evolve. The apparent escalation of malaria cases in the early years of SNEM, for example, was a misleading artifact of the expanding information system and reinterpretations of key variables--how malaria was defined, among other things.

A similar situation arose when the Government of Guatemala shifted to a program budget in 1964; it took some time before Government accountants became familiar and comfortable with the new system. Any program-level financial analyses that covered this period would have to consider not only the accounting change but also the unreliability of the early program budget data. Less publicized but equally distortionary effects can result from internal changes in definitions or interpretations of key variables. The lack of standardized definitions is a severe problem in Guatemala, as in many other countries--there is even disagreement between regions over the definition of "child," so cross-sectional comparisons of such things as child-mortality rates are problematic.

Yet another "hidden" discontinuity in time-series data was uncovered in Guatemala. As a result of the 1972 census, population estimates for previous years were adjusted downward by some 17 percent. Any historical "coverage" or "rate" information reported prior to this year would then be in error by a similar amount. Gross mortality rates, malaria positivity rates, and key sampling percentages all would be higher, for example, and the 17-percent difference could make a big difference in judging the effectiveness of individual programs or projects that spanned this period.

Boxes G-1 and G-2 present the working hypotheses and the financing questions used by the evaluation team.

Table G-3. General Economic Environment
Working Hypotheses

The following is a listing of the economic hypotheses considered by the evaluation team during the course of this study. Some of these hypotheses were consolidated into one "symmetric" hypothesis, while others simply could not be addressed with the data available.

1. The less the uncertainty about recurring project benefits and costs, the more sustainable the project.
2. Projects initiated during periods of economic decline are more sustainable. (These projects are also more likely to be extended and to reflect a larger difference between initial and final objectives.)
3. Projects terminated during periods of economic growth are more sustainable.
4. The greater the public share in economic growth, the more sustainable the project. (Symmetrically, the less the public share in economic declines, the more sustainable the project.)
5. The greater the Ministry of Health's share in public sector growth, the more sustainable the project. (Symmetrically, the less the Ministry's share in economic declines, the more sustainable the project.)
6. The greater the program division's share in increases in the Ministry of Health budget, the more sustainable the project. (Symmetrically, the less the share in decreases, the more sustainable the project.)
7. During periods of economic decline, projects that have specific and significant long-run cost-containment and cost-reduction components are more sustainable.

8. During periods of economic decline, projects that seek to extend the level or quality of service are less sustainable.
9. The greater the number and degree of secondary benefits (positive externalities), the greater the sustainability of the project. Similarly, the greater the number and degree of indirect costs, the less sustainable the project.
10. More egalitarian income distributions (and economic growth that equalizes income distribution) promote sustainability of projects.
11. Projects that produce immediate benefits and postpone costs are more sustainable than those with immediate costs and long-term benefits (related to visibility of outputs in project characteristics).
12. Projects that rely on relatively durable and maintenance-free capital equipment are more sustainable.
13. Projects that utilize inputs with stable or declining real and nominal prices are more sustainable.
14. Projects that rely more on local input markets are more sustainable. Similarly, projects that rely on regional suppliers are more sustainable than those that rely on international sources.

Box G-2. Contextual Factors: Financing Questions

1. What percentage of total costs had the Ministry of Health absorbed by the end of the project?
2. Were there any differences in the absorption rate for various cost categories (salaried positions, materials, equipment, training)?
3. How much of the estimated annual operation and maintenance cost required (a) capital investment and (b) foreign exchange?
4. Was a continuing requirement for imports due to local or regional unavailability of inputs or was it an institutional requirement?
5. Did the project reduce the funding available for other Ministry of Health programs in particular, curative care programs?
6. Were the financing requirements and mechanisms at the end of the project essentially the same as those during the project? (Describe significant differences.)
7. Was there any renegotiation of financing terms or mechanisms during or following termination of the project?
8. Were there any significant changes in types of taxes, tax levels, or tax structure during the relevant period? (These changes need not relate directly to the project.)
9. What specific mechanisms were available for continued financing (e.g. user fees, quotas, local taxes,)?
10. Was there any possibility of substituting donated services or goods (e.g., labor, materials, office space) for explicit financial contributions?

11. Who was responsible for continued financing (beneficiaries, communities, regions, central government, external sources)?
12. Who should have been responsible from a public finance standpoint (considering spillover effects)?
13. Was information available on of project beneficiaries' ability to pay?
14. Would the consequences of lack of continued financing be an immediate loss of services, gradual decrease in level or quality of services, or the inability to expand similar service delivery?
15. Were there historical precedents for the kind of financing adopted?
16. Were there established mechanisms for financial evaluation of projects?
17. Did the financing mechanism require changes in historical practice (e.g., paying for what used to be free)?
18. Was there any phase-in of the new financing mechanism, including a clear indication of when A.I.D. support would end?
19. Were other external donors already identified?