

AID EVALUATION PAPER 5

AGRICULTURAL SECTOR STUDIES  
An Evaluation of AID's Recent Experience

by

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A/AID/Program Evaluation

with

Comments from AID's Professional Community

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AID Evaluation Papers represent the views of their author  
and are not intended as statements of Agency policy.

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## SUMMARY

During a three month period, two members of the Program Evaluation staff have closely reviewed the record of twelve agricultural sector studies performed by or for the Agency within the last seven years, and become conversant on at least ten others. Included in the sample were short term TDY team studies, Mission in-house reviews, longer term contracted jobs and a few experimental computerized models.

A disturbing picture emerges from the readings and interviews: of the mediocre quality of some of the studies, the low rates of utilization for most of the studies, and the lack of an observable correspondence between quality and utilization. The Agency's efforts to improve agricultural planning by taking a sector-wide perspective on priorities and linkages appear not to be organized and instrumented as well as they could to support the sector thrust called for in the new guidelines. For other sectors, the Agency has still less experience.

We suggest that the Agency invest in building up its competence for and confidence in the new techniques. The emphasis should be on further development of two approaches: (1) the comprehensive, computerized modelling approach and (2) an improved and reliable analytical base for the more traditional form of sector analysis. The Agency should try to categorize the circumstances which call for these different levels of analytical sophistication and to define the limits of reliability which recommendations from the less sophisticated approaches can reach.

The new sector orientation has great potential, but the Agency will miss the chief advantages if it satisfies itself with an appeal to operating and planning units to "think" sector. Instead, it must take the methodological assignment, and staffing implications, seriously.

## A. INTRODUCTION

Past experience in AID has shown that planning at the macro level does not give adequate attention to priorities and relationships within any given sector. The opposite approach of planning at the project level has also been judged deficient for identifying sector priorities because the project perspective is too narrow. Thus, it is said, the Agency's portfolio includes many programs and projects which do not address the critical problems, or which fail to identify and manipulate all the related variables critical to project success. The two approaches clearly leave a gap in the planning process, a gap which must be filled by the analysis of a system of variables which is larger than that in view of the typical project technician, yet smaller than the national planning model. The sector system is in that range, and sector analysis is one way to fill the gap.

The sector approach is, of course, embedded in the Agency's operation. Technical service divisions have been traditionally divided on sector lines (some of the new technical offices are not), and AID's efforts to "concentrate" have usually led to sector specialization rather than sub-sector specialization such as the Rockefeller Foundation's commitment to agricultural research and the Agricultural Development Council's focus on professional training. The Agency recently has been shifting program planners to sector analysis. The Latin American Bureau established positions for specialists in sector analysis in 1969 (PPC had done this in 1966), and the Asia and Africa Bureaus are now following that lead. The planning guidance for FY 1974 attaches great importance to the new conceptual orientation.

This evaluation assesses part of the Agency's record in sector analysis. We want to know first if sector analyses have shown they can do the job they have been given, that is, provide greater resolution to priorities and relationships. Also, we want to determine the type of sector analysis that captures the advantages of the new approaches without running up unjustified costs. Finally, we want to see whether the Agency has used sector analyses the way they ought to be used.

The Agency does not have extensive experience in sector analysis generally. However, in the agricultural field the collection of documents purporting to be or otherwise resembling

sector analysis is large enough to warrant a retrospective evaluation. The extent to which the recommendations apply to other sectors has not been determined.

The initiative for the evaluation came from two successive directors of the Program Evaluation staff -- C. W. Kontos and R. L. Hubbell, whose advice and assistance we wish to recognize. The study fits in with a number of studies underway in the Agency dealing with methodology. These other studies do not focus on the Agency's historical record, but in overall importance they probably outrank our evaluation because, as has become obvious to us, the methodology of sector analysis is developing rapidly and the route to its perfection cannot be clearly discerned in the historical record.

## B. EVALUATION DESIGN

Initially, we identified over fifty AID reports, or collections of reports, which fit our broad definition of agricultural sector analyses. Twelve reports were selected for comparative study:

- four short term TDY team reports;
- four Mission analyses submitted in support of a loan, annual budget, or Mission strategy;
- four reports resulting from a professional contract of fairly long duration.

Half are drawn from Latin America, corresponding roughly to that area's representation among the original collection. Most of the original collection and the twelve reports selected date from 1965. A list of the twelve final reports is given in table 1. An annotated list of the twelve is presented in the appendix.

## TABLE 1

## LIST OF SELECTED SECTOR ANALYSES

## TDY Team Reports

- Getting Congolese Agriculture Moving, CEFerguson (AID) and WIJones (USDA), 1968.
- Prospects for Turkish Agriculture, CRElkinson (AID) et al, 1966.
- Evaluation Report, Guyana Agriculture Sector, MLCox (AID) and RNewberg (AID), 1969.
- Evaluation Report, Dominican Republic, Agriculture Sector, MLCox (AID) and RNewberg (AID), 1969.

## Mission Studies

- Rural Development Program Evaluation Report, USAID/Korea (and Moseman TDY team), 1967.
- Costa Rica: Agricultural Development Program and related papers, 1970.
- Long Range Agricultural Adjustment Analysis, USAID/India, 1969.
- Colombia: Sector Loan Papers, (1968, 1969, 1970), USAID/Colombia.

## Contract Studies

- Agricultural Sectoral Analysis for El Salvador, RRNathan Assoc., 1969.
- Agricultural Development and Policy in Guatemala, Iowa State University, 1969.
- Development of Agriculture and Agro-Industry in Ethiopia, Strategy and Programs, Stanford Research Inst., 1969.
- Strategies and Recommendations for Nigerian Rural Development 1969/1985, Consortium for the Study of Nigerian Rural Development, 1969.

We examined four dimensions of each study: purpose, method, quality and utilization. The first two were ascertained through interviews or from the reports themselves. Quality on the other hand was impossible to measure in the time available. We weren't sufficiently familiar with the country situations accurately to judge the validity of the analysis and recommendations. Interviews with people who had been stationed in the countries did not solve the problem, since some criticisms seemed no more convincing than the reports they condemned. Nor were we able to devise a sufficient set of reliable indicators of quality. Therefore we have retreated to generalizations about a few attributes of quality which seemed to be self evident. The dimension of utilization dominated the interviews and plays a paramount role in this report. We feel we interviewed in sufficient depth for each study to understand the degree to which the study and its report influenced Mission and host government behavior, and the reasons why so many of the twelve have had so little impact. Some reports required more interviews than others, because whenever testimony from the first few discussions was contradictory we would have to find additional "knowledgeable" persons to talk with until we were satisfied we had cut through the personal prejudices that often distort facts. The important analytical job was to relate the four sets of issues: to see whether methodology affected quality, whether quality related to utilization, etc.

One of the crucial and fascinating methodological issues, the relative superiority of computerized models, could be touched on only lightly through the comparative study of these twelve reports, since none of them represented the state of that art. We approached this issue in another way -- through readings and interviews with practitioners in AID (LA/DR/SASS), the World Bank and Michigan State University. One of the authors also attended the A/D/C Workshop on "Problems of Verification and Policy Simulation in Sectoral Models for Less Developed Countries" held at Purdue University, February 28 and 29, 1972.

For the main body of the review, the two authors read the twelve reports, assembled and read associated documents, and interviewed about fifty officials who were involved with the origin, preparation and/or use of one or more of the studies (averaging five interviews per study). The research phase lasted three months, taking about half time for each author. That effort does no justice to the importance of the subject, and the reader should be aware of the limited empirical base for our "findings."

Certainly we cannot offer what perhaps would have been most valuable, either an evaluation plan for the rigorous assessment

of individual sector analyses, or a blueprint for the future. Nevertheless we think this retrospective review of AID's experience gives clues about designing effective and efficient sector analyses, and could serve as a starting point for discussion.

## C. DEFINITIONS

In reading and interviews one gets quickly embroiled in the terminological tangle caused by indiscriminate use of the words sector, sector analysis, sector survey and the like. This paper uses the following definitions and distinctions.

### 1. Sector

We use the word sector the way most people use it -- to encompass one of the industrial classes in standard GNP accounts. Joan Nelson's description, written for PPC in 1966, will do: "a set of activities which relate to output of a class of goods and services -- agricultural products, minerals, manufactured goods, transportation services, power, construction, education services, health services."<sup>1/</sup>

Major elements of the agricultural sector, e.g. agricultural marketing or rural N.E. Brazil, are subsectors. The fifty odd studies in the initial collection were all focussed at the sector level, except for a few that spotlighted a subject (rice in Indonesia) so broad that the study couldn't avoid illuminating the entire sector. The fact that some of the fifty reports ignored certain subsectors, e.g. livestock, forestry, or agricultural education, was not reason for disqualifying them. They can be considered sector studies with implicit priorities.

### 2. Sector Analysis

In this report sector analysis means a study of the principal socio-economic factors governing development of the sector, for the purpose of identifying manageable, integrated projects and policies with high payoff. Phrases such as sector survey, sector study and sector review mean approximately the same thing.

In an early draft of this report, we restricted the phrase sector analysis to comprehensive, computerized model building

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<sup>1/</sup> Joan Nelson "Increasing AID's Ability to Conduct Sector Analysis" Mimeographed paper for PC/PPD dated August 5, 1966. Page 1 of 15 pages.

and used the phrase sector study to refer both to sector analysis and to less elegant studies. That restricted definition has certain advantages. It conforms to current usage among mathematicians, econometricians and systems analysts. Also it discriminates against the many reports which confuse quantification with analysis and, after presenting a number of tables, offer conclusions which have no analytical support at all.

But the position has been abandoned in this final report. Current Agency usage gives a broader meaning to sector analysis, and we would certainly not presume to tell many officers who have been making informed decisions all their professional lives without recourse to computerized models that they have been engaged in some other mental exercise than analysis. The critical issue concerning the depth and rigor of analysis is discussed in section D5.

### 3. Sector Evaluation

This word is restricted to a retrospective review of programs and projects in the sector. A thorough sector analysis should include evaluation, because decision makers are interested in knowing what changes to make in ongoing programs or what new activities to add to what is already being done. The Agency, however, has never been strong on retrospective review of experience (though that situation is changing with the introduction of a formal project design and evaluation system), and, not surprisingly, few of the documents in the original collection contained much in the way of evaluation even though that word may appear in the title. A sector evaluation which looked exclusively at the progress of ongoing projects toward stated goals, without relating that success to the priorities determined in a sector analysis could not itself be called a sector analysis.

## D. FINDINGS

### I. Purpose

Ten of the twelve studies were propelled by the desire of someone in the Mission (director, program officer, rural development officer) to design a sensible set of agricultural projects for the Agency. Three can be directly attributed to dissatisfaction with the existing program, and in all cases the decision to make such an analysis can be associated with a general uneasiness about the significance of AID's current activities and an assumption that unfamiliar but allegedly superior planning skills were available. Therefore, the differing form the studies take reflects not so much differing reasons for the studies as the skills and predispositions of the officers who fleshed out the proposals: their feelings about deadlines, report format, financial restraints, etc. Our interviews showed that the reason one Mission orchestrates its own review and another gets a professional contract or TDY support depends as much or more on historical associations of the principal officers in the Mission than on the logical imperatives of country situations and Mission staffing patterns. If Joel Bernstein had been Director in USAID/Dominican Republic in 1969, he might have initiated an in-house evaluation similar to the one he called for in USAID/Korea three years before, rather than rely on a TDY team. If Larry Harrison had gone as Director to Guatemala rather than Costa Rica, the Iowa State team might never have been sponsored and, if it had, it might well have been used in quite a different way.

The "personalized" approach to sector analysis may not be the most efficient way to do business. But it is a phenomenon hardly unique in Agency affairs, and it adds legitimacy to our evaluation design because it allowed us to compare the impact of different methods for arriving at the same common goal -- a sensible set of agricultural projects. If TDY surveys were traditionally set up to serve one purpose, and long term contracts to serve another, then there wouldn't have been the basis for comparison.

Having stressed what we recognize as a similarity of intent behind most sector analyses, we admit that the circumstances for each, and the kind of recommendations the Missions expected, varied considerably. The important factors which characterize the studies are summarized next.

- (a) Principal Audience. Though the twelve studies were all intended to influence AID's programs, they differ in the relative importance they give to host country or other donor readership. Some, typically the TDY reports, are written mainly for AID personnel. Six of the others offered recommendations addressed as much to the host government as to USAID. The Nigerian and Korean reports even separated the two series of recommendations. Another sort of exercise -- some persons argue this is the most fruitful sort -- would be one intended to build institutional capacity in the host country for continuing sector study, with lessons for AID a subsidiary objective. None of the twelve fit that pattern, though two of the extra, computerized sector analyses we asked about are pointed in that direction: the LA/DR/SASS work on Colombia and the Michigan State University work on Korea, neither of which should be confused with the reports included in the list of twelve.
- (b) Linkage to Lending. Two of the Mission studies as well as one of the contracted analyses were undertaken as a prelude to sector loans, and another of the contracted studies was expected to generate a number of project loan proposals for an expanding USAID program in agriculture. Therefore, utilization was built into these four study exercises. By contrast, the other eight were not associated with follow-on funding commitments. The analyses apparently of above average quality were not always the ones linked to the loans. In fact two of the linked studies barely qualify as sector analyses; they have the flavor of promotional devices.
- (c) Project Detail. Two of the study teams were enjoined to develop a list of separate, bankable, high priority projects. Most of the rest were expected to present recommendations, but the level of project specificity -- that is, details on existing or potential projects -- varied. The India report was unique in that there was no intention of capping off the analysis with explicit recommendations, though the latter were implicit in the discussion.
- (d) Constraints on Redesign. A team that feels free to suggest radical surgery on existing USAID projects is likely to produce more controversial proposals than the team expected to accept the prevailing strategy and merely fill out the project portfolio. In principle,

no ongoing project or Mission policy should be protected, indeed excessive use of such constraints can destroy the utility of sector study. But in practice we found that to accept some constraints as a fact of life was a prerequisite to having the report considered successful. What we saw frequently in the twelve examples, and in other analyses to which we've been exposed, was a problem of acceptability that appeared when the team's recommendations cut deeper or shallower than the Mission intended the team to cut. Frequently the Mission did not realize this constraint until after the team presented its report. A good example is the Guyana study. It appears that the Mission in Georgetown narrowed its term of reference only after the report, which covered more ground than expected (allegedly with some loss in profundity), had been drafted. On this issue of constraints, as well as the issue of sector scope discussed next, we found that the Missions were remiss in the provision of terms of reference to the team: whether, for example the team should (1) stick to new projects, (2) accept the present projects and advise only on better use of instruments, (3) advise on present as well as new projects, but avoid drastic changes and controversies, or (4) advise at will, including drastic modifications of present projects. Without such terms, the team is apt to learn too late that the Mission had defenses, unfelt needs and other valid causes to constrain the inquiry. Three of four TDY reports were undermined by this factor: intuitively it would appear to apply more to TDY studies than to contract studies. Nevertheless, evidence of similar problems emerged in Nigeria and our guess is that any contract study is also susceptible.

- (e) Sector Scope. Some teams looked at many more subsectors than others. A review of eleven of the twelve analyses shows that ten gave attention to livestock, eight to credit (the other three gave it a few lines in the report), eight to cereal price supports, seven to the small farmer issue, six to middle level agricultural training, six to forestry, and one to mechanization. The decision to ignore a sub-sector typically is made by the team with the tacit approval of the Mission.

## 2. Methods

Methodological issues are discussed in the sections on purpose, quality and utilization, since the advantages that one alternative has over the other can best be assessed through

its impact on these indicators. The alternatives of principal interest, and a summary finding on each, follows:

- (a) Short term (e.g. four weeks for four men) versus long term (e.g. two years for four resident team members, plus visits by specialists). Short term sector analyses appear to suffer severe disadvantages. A more useful comparison would have been between long term and medium term (e.g. four months for four men). There may be a time limit beyond which additional work of the sort usually provided by AID and contract personnel is not productive, but our study doesn't provide any clues.
- (b) USAID versus non-USAID staffing. Mission personnel should be involved in the analysis in order to provide local background and a basis for follow through, but a non-USAID presence on the study team appears equally necessary to provide new insights and greater objectivity.
- (c) AID versus non-AID staffing. As just mentioned, Mission participation is important. There is no evidence to suggest that the non-Mission presence must come from outside AID/W or other Missions. However, since other parts of AID cannot always supply the personnel and expertise required by the Mission to augment its own staff, especially on the larger analyses, the role for non-AID staffing would appear in practice to be secure.
- (d) Host government involvement in study design and execution. This appears to be always desirable, more to encourage utilization than to assure high quality work.

### 3. Quality

Despite handicaps in evaluating the quality of work, particularly in assessing the realism of the recommendations, several generalizations about the material are appropriate. Most of the comments in this section reflect our opinions and cannot be well defended by evidence presented in this review. However, we feel that other observers, had they joined us in the evaluation, would have come to the same conclusions.

- (a) As examples of empirical inquiry the work is not good. Signs of excellence, and there were many, serve best to show the level of superficiality of the rest of the so-called analysis. This comment does not intend to assail the validity of the recommendations. Indeed

on the average the presentations in the twelve reports are probably superior to most other AID reports at this level of generality. And a few of them, for example the India paper, is as good an in-house study as we have seen. Nevertheless, most of the twelve analyses rely so much on ad hoc judgments and guesses that one has to have considerable faith in the intuitive abilities of the teams to accept their proposals as superior to the results of normal Mission decision-making on agricultural programs. In other words, if these analyses bring the Agency's planning competence forward, it is not because of better analytical techniques but because experts are being forced to offer their judgments on matters formerly obscured by the project approach. The Agency may be fooling itself about its competence to do or recognize good scientific work in the new field of sector analysis in the time usually allowed for it, while at the same time profiting from an unfamiliar perspective on old problems. To verify the lack of analytical rigor, a count was made of the number of studies which examined five critical, quantitative relationships that one might expect of an agricultural sector analysis:

- (1) relation of crop targets to demand estimates,
- (2) relation of fertilizer targets to crop targets,
- (3) relation of credit targets to fertilizer and other input targets,
- (4) relation of the educational targets to manpower needs, and
- (5) relation of mechanization to employment.

These are essentially consistency checks -- a team that recommends several targets without being able to show the logical quantitative relations seems to us to have weakened the rationale for the study and left doubts that were supposed to have been dissipated. Only six of eleven studies performed the quantitative crop analysis, two measured fertilizer requirements, none measured credit needs, three measured education, and none treated mechanization. That means 11 out of 55 practicable quantitative exercises were actually performed (five relationships for each of eleven studies -- Colombia excluded). The contractors had the best record (7 out of 20), the TDY teams the worst (2 out of 20). The latter can offer lack of time as an excuse. The contractors and the Missions cannot.

Neither the methodology of sector analyses nor their recommendations can be accepted unquestioningly until these links are forged: for example until the call for

rapid increases in fertilizer supplies, which is prominent in most of the twelve studies, is supported by figures on crop targets, response rates, acreages under new technologies, etc. The information gap on credit is even more striking. The importance of credit is asserted in nine of eleven reports, and most of these offer an aggregate figure for credit needs in the near future. None of those figures were anchored to crop and input targets presented elsewhere.

- (b) Putting aside the issue of analytical discipline, we asked ourselves whether on a very general level, and irrespective of size, some studies seemed to be intrinsically better than others, in the sense of having a stronger grasp of issues and relationships dominating the sector and a more reasonable, coherent statement of findings. Dividing the twelve subjectively, according to these criteria, into three groups of four studies each, we then examined the highest and lowest groups for any common characteristics with respect to clarity of purpose or methodology. No common features were evident. This finding we think may be particularly significant because it suggests that the quality of the report does not depend on (1) the clarity with which the purposes were originally stated (2) the length of time taken,<sup>2/</sup> (3) the staffing,<sup>3/</sup> or (4) the degree of host government involvement.

It is tempting to reject all these factors, and repeat the comment made by many of the interviewees, that the quality of the report was a function of the quality of the team. A good AID TDY team would beat a mediocre contract team, etc., etc. We are dissuaded from this conclusion by personal familiarity with several of the principal team members and the knowledge that some of what appeared to us to be the most coherent reports were associated in the minds of some of our interviewees with unimpressive teams, and some of the reports we found with the weakest arguments were associated with outstanding agricultural experts.

<sup>2/</sup>That is, if a TDY team writing a poor report had had more time, we hypothesize that it would have written a longer poor report.

<sup>3/</sup>Here we found a slight edge for contracts, which got 9 points, over TDY (8 points) and Mission (7 points). The differences are too small to discriminate. This is in itself interesting. We would have expected the TDY reports to run a poor third.

This highly subjective assessment leaves us where we were before, without any predictive indicators of success and with the suspicion that there is no basis yet for a consensus on the best approach to sector analysis. We are looking at a sample from an uneven collection of "analytical" studies. The continuing prominent role played by intuition, ad hoc judgments, and other subjective phenomena is drowning out evidence of other factors that will begin to make a difference as soon as the basic analytical skills are improved. We do not claim the studies are useless. In fact, if the recommendations were all accepted there would undoubtedly be a collective improvement in AID's portfolio. And a few of the twelve reveal a common sense position on problems of strategy that cannot be easily rejected and indicate the potential of this new approach to planning. Nevertheless in their totality the twelve show us that the Agency has been having trouble organizing the kind of analysis the sector approach requires.

- (c) There may be grounds to be somewhat harsher on studies conducted solely by Mission personnel, that is, without AID/W or other outside involvement. Two of the four studies classified as Mission reports are of this sort. In theory the capacity of in-house task forces to identify missing pieces, or low priorities, in the on-going Mission program is suspect, and in practice we find it left something to be desired. Both in Korea and Colombia, for example, events subsequent to the Mission reviews suggest that some key factors were not brought into perspective and that a few on-going programs received more approval than they should have.
- (d) "Universality" is one aspect of quality we attempted to explore analytically. It refers to the ability of two teams, in different countries, to arrive at similar sets of recommendations for similar conditions. Universality depends, of course, upon a high level of objectivity, and is defeated whenever preconceptions about the development process distort team judgments. If sector analyses are to be useful, these distortions must be eliminated. We failed in this attempt, because we were not sure of local conditions. This is one of the areas where continuing research to measure the depth of the distortion may be warranted.

#### 4. Utilization

Utilization rates for the sector analyses were very low and quite distressing, except in Costa Rica and Colombia where these studies were an integral part of the Missions' preparations for a sector loan. The latter two perhaps should be ignored in this discussion since utilization therein is automatic. However, if we substitute the Associated Colleges of the Midwest study of Costa Rica, and the Witt-Atkinson report on Colombia, for the Missions' studies in those two countries (see the appendix for more detail), bringing the sample size back up to twelve, the following results emerge according to our informants. First, five studies had practically no influence. Three of these were TDY studies; the others were Mission generated. Second, two contract studies have had no observable impact yet, and, according to some AID/W observers, will remain that way. These latter observations seem premature, however, and the two entries had better be left with question marks. One of them (the CSNRD study of Nigeria) might eventually have substantial influence. The other might have more modest influence. Third, three studies appear to have had modest results. That is, influence was easily detected, but, in our opinion, not enough to be commensurate with the resources invested in the study. The group includes the interesting Mission exercise in Korea. Finally, two analyses are unanimously described as successes -- the Turkey exercise as a prelude to the wheat program and the Guatemala exercise as a prelude to the 1970 sector loan. The overall record is not impressive. Perhaps when the results are all known, four of the twelve sector analyses will be said to have accomplished what a majority of the AID officers who initiated them hoped they would.

Whether a study influences USAID and host government decisions appears in any case to have little to do with the quality of the reports, or with the intrinsic merits of individual recommendations. The evidence on this point is overwhelming -- studies of considerable value wasting on Mission shelves, sensible advice rejected out of hand by the Mission and AID/W, superficial reports unanimously acclaimed as essential to the formulation of a sector loan. Two things are obvious. First that other factors have a greater influence on utilization than does the quality of the analysis. Second, that improvements in the quality of the study may not result in higher utilization rates unless the other factors are manipulated or suppressed.

Among the most serious factors that appear to undermine utilization are the following:

- (a) Low absorptive capacity in the Missions and AID/W to critically review and use a study. Some of the criticism heard about the analyses appeared unwarranted. A few officers in influential positions who were quick to criticize showed signs in the interviews of not having read the reports or understood their implications. Extraneous factors such as personality conflicts, inter-office warfare, and minor issues and irregularities that influence opinions -- factors that are usually suppressed in Agency decisions -- appear in the area of sector analyses to have unusually strong influence. This is especially evident in the Nigerian study, an extraordinary example of the interference of the human factor with the effective utilization of research (it would make an ideal case study). The totality of the faults suggests that either because the audience is ill prepared, or the style and format of the reports are unimpressive, or both, the Agency is unable to effectively exploit the sector analysis instrument.
- (b) Short visits. We investigated the effects of five short-term TDY team visits in addition to the four included in the sample proper. Of the nine, two were put to substantial use, two had a modest impact, and five had little or no impact. The record is bad enough to suggest that the standard form of TDY visits has inherent disadvantages that disable the crew even before it arrives. Some have been mentioned above. These disabling factors do not appear to relate to the quality of the team or to its analytical performance.

Among the factors that appear to help assure utilization were the following:

- (a) Determined and purposeful Mission management of the study. Turkey and Costa Rica offer good examples of study teams, drawn largely from non-Mission sources, being directed and manipulated by strong Mission leadership to produce detailed recommendations suited to a general action program whose dimensions were already in mind. One wonders if such "directed" studies really qualify as sector studies, and if they don't so what.

- (b) Fairly broad Mission involvement in the study. Reports prepared entirely by outsiders must fight for the endorsement of Mission personnel. Given the high turnover rates in Missions, and an apparent built-in propensity of new officers to reject research instigated by predecessors, this is a particularly difficult problem to remedy. The problem is most apparent with the long term studies. It happened in Nigeria, where the CSNRD research teams watched their support in AID/W and USAID gradually disappear as personnel actions replaced most of the original sponsoring officers. CSNRD is left with critics in AID positions where support is still essential, and on the basis of readings and other interviews the criticism does not appear to us to be altogether valid. The El Salvador story is even more distressing. The forceful and imaginative Mission Director and Rural Development Officer who called for the Nathan sector study in late 1968 were both gone when it was ready in late 1969. Replacements did not arrive for months, and no resident USAID officer pressed for printing the draft. The four volume report was not printed in English until mid-1970 or in Spanish until mid-1971. By now the prevailing view in AID/W is that it is practically useless, a view we do not share. The way to avoid this problem is to build-in USAID involvement, and thus institutionalize USAID's commitment. This can be accomplished via the "directed" study route just described, but this is not fail-safe since the "director" can disappear, as he did in El Salvador.
- (c) Articulation and agreement on purpose and guidelines before study begins. As mentioned in D-1-d, this seems especially important to TDY teams.
- (d) Host government involvement. Participation by host personnel in designing and carrying out a sector analysis would seem essential if the host government is expected to carry out part of the new program. Among the contract and Mission studies, the Ethiopian and Costa Rican exercises appear to have gained substantially from the intimate involvement of local personnel, and the Nigerian and Korean exercises suffered from the lack of it (the Michigan State University team now in Korea helping to develop a simulation model is working closely with Korean colleagues). Conditions with the other four long term analyses are unclear. The consequences of non-involvement are less severe

with the TDY short term studies (where non-involvement is the rule), since such studies generally focus recommendations on Mission activities.

## 5. The Trend to Computerized Sector Models

Some officers in AID have concluded that sector analyses of the types we have examined are unacceptable, that they depend so much on crude reckoning and guess work as to leave doubts on the validity of all their so-called findings. These officers argue that, because of the complexity of the agricultural sector, mental arithmetic and intuition offer an inadequate basis for the identification of bottlenecks and comparisons of alternatives and must, therefore, give way to procedures which are fully quantitative, with relationships between variables expressed in mathematical "models" of reality, models of such size and complexity that the arithmetic "analysis" is left to computers rather than to men. We must agree, after our evaluation, that the quality and utilization of the familiar techniques are unimpressive. And brief exposure to the new modeling techniques suggests to us that they will in the future offer an improved basis for decision making. One could hypothesize that as the analysis becomes more rigorous through the introduction of quantitative techniques into the reasoning process the area of dispute will diminish and "findings" will be accepted and applied.

Nevertheless we urge caution. Only a few examples of computerized sector models were available for study -- the Michigan State University simulation model of Nigeria, the new MSU model for Korea, the LA/DR/SASS input output model of Colombia, the IBRD programming model of Mexico and some provincial programming models of the Punjab. We were not competent to judge their validity or utility, or their superiority over traditional analyses. However, after readings and interviews, we are prepared to make the following observations.

- (a) The state of the art of computerized modeling needs to be substantially improved and codified before it realizes its promise as a decision tool. The artisans themselves are not in agreement. The simulation sector models being developed at Michigan State University differ philosophically from the linear programming models under construction elsewhere (even though the former may incorporate programming components). Waiting down the road is a set of even more rigorous econometric model building methods which depend on data bases unavailable in the LDC's at the present time. And, somewhat

apart from the class that includes all these modeling jobs is the input-output work going on in LA/DR/SASS, a simpler, empirical accounting system with good diagnostic potential. These alternate computerized systems are still being developed; proponents of each criticize the others; the relative advantages and opportunities are still undetermined; and there is less cross fertilization than there ought to be.<sup>4/</sup>

- (b) A large percentage of the officers who make decisions about AID's rural development activities view the model building professions with suspicion or hostility. Widespread negative sentiments, unsupported by facts, have already damaged the reputation of MSU's simulation model of the Nigerian economy and threaten the financial base for MSU's new initiative in Korea and the LA/DR/SASS work on Colombia. Even if the models were perfected, a public relations job will remain. The learning process will take time. In the interim the demand for simpler sector analyses will persist.
- (c) Some LDCs may not have the data base to support computerized modeling. For countries such as these a less elegant form of sector analyses ought to be available until such time as the data base is enlarged.
- (d) Computerized models are of dubious economy if conducted with a view to improve only AID's programs. The demand for data, the broad uses to which a sector analysis can be put, and other factors argue for a process in which the host government will be deeply involved and which will leave behind in the LDC a continuing institutional competence. Some host governments are unprepared for such an enterprise (irrespective of the data base).
- (e) The other side of that coin is that some Mission decisions may not require the level of detail offered by computerized analysis. A Mission looking for a major new program to replace a set of terminating projects can profit from a review with outside help of the major dynamic elements in the agricultural sector and an identification of several priority elements suited to AID's resources. So long as the Mission is satisfied that the new program will address one of the important problems -- say

<sup>4/</sup>The latter condition is changing rapidly. Under the sponsorship of A/D/C and AID a series of multidisciplinary seminars on agricultural sector studies has been begun in the last year.

marketing -- the sector analysis team has played the appointed role. If a computerized systems analysis is then performed for that proposed program, the new Agency guidelines are also satisfied.

The last remarks lead us to the heart of the controversy. Supporters of the more sophisticated sector analyses claim that without a rigorous look at disaggregated data the Agency has and will continue to make mistakes on broad policy choices as well as in detailed project planning, mistakes that are frequent and usually serious enough to cause AID agricultural programs to give unexpected and undesired results. They allege that short TDY team visits, which require far more intuitive judgment than analysis, fail to do the job that has to be done because (1) they do not give orders of magnitude to relationships that are intuitively obvious but unquantified and (2) they miss the non-intuitive relationships completely. The LA/DR/SASS work on Colombia has already shown that previous Mission "judgments" about the employment effects of the AID-financed INCORA credit program were in error, and that a redeployment of AID monies could significantly expand employment without sacrificing production.

The "old school," on the other hand, argues that the model builders exaggerate both the frequency of gross errors attributable to bad judgments in the traditional approach, as well as the ability of the quantitative methodologies to improve upon this performance. They contend that the broad choices that face the Mission can be identified and ranked by visiting and in-house experts without resort to "expensive" and "esoteric" academic exercises. The result may not be "optimal", but it will be sensible and probably as good or better than anything the computer spews forth. Finally they argue that computer solutions are particularly dangerous because assumptions (judgments) in fact pervade the models, but get so impacted that conclusions drawn have a deceptive and unwarranted appearance of realism (modeling can also force judgments out into the open: it is not clear to us whether on balance judgments are obscured or exposed).

The important thing is to determine the degree of quantification and disaggregation necessary to provide a basis for decision-making. Some things the TDY sector teams will never do well, for example, determine the proper support level for cereal prices or the ultimate employment impact of a potato campaign. TDY guesses at this level of detail can be substantially improved by systems analysis. Some things the TDY sector teams may be able to do better than the men who work with machines, for example, advise whether a nation's export

policy is consistent with a major AID initiative in livestock, or whether the extension service ought to be integrated with the credit authority. Decisions at this level of policy revolve around institutional issues that the tools of sector analysis are unable to quantify as yet. For a large range of decisions in the middle of this spectrum the advantages are not certain. The Colombian computer exercise can point to errors attributable to judgments based on ignorance, but we are not convinced that these are typical or inherent with the less elegant methodologies. To capture whatever advantages the sector perspective has over the project perspective may simply require that TDY teams establish a broad policy outline within which the tools of systems analysis are later carefully applied to project design. It may and it may not. Some of the practitioners we admire the most insist that the systematic tools must be applied at the sector level or else none of the subsequent project design can be trusted. Others say this is nonsense -- that the major bottlenecks are evident to good visiting teams and that the investment of analytical skills ought to be expended on prices, linkages and administrative issues at the project level rather than overall sector optimization. We think this issue demands further investigation.

## E. RECOMMENDATIONS

The following recommendations point in the direction of improving the Agency's commitment, competence and confidence in sector analysis.

- (1) The work on computerized modeling should be expanded, with increased resources turned to both contract and in-house studies. Given the potential contribution of sector analysis to agricultural planning, it would seem inappropriate to have experts already linked to AID, such as Day (Wisconsin), Singh (Ohio State), Johnson (MSU), struggling to justify even a modest research program, or LA/DR/SASS hard pressed to cope with more than one country.
- (2) The work on computerized modeling must be recognized as experimental, at least for the next few years. There is too much uncertainty among experts about the validity of the models, the differences between them, and the Missions' and host governments' capacity to absorb them, to warrant rapid extension. Cases where models are now being applied should be treated as tests. Better yet, the program to apply them successively in several countries should reflect an experimental design. For example, a simulation model could be built along side the SASS input-output model in Colombia, in order to weigh their comparative strengths, and to see how they might reinforce each other. In Korea, the process could be reversed, building up the more exacting input-output and linear program components into a system rivaling that of the MSU eclectic simulation. Also, decisions on the extension of the program to other countries should depend less on the size of the AID country budget than on the ability, tenure and commitment of the host government to participate in a program designed among other things to test new methods over a period of years.
- (3) SASS' pioneering efforts in computerized sector analysis should get Agency-wide recognition. These initiatives in agriculture are important not only to LA but to AID as a whole. The SASS budget should not have to depend completely on the fortunes of sector analysis in the self-imposed priorities of a single regional bureau, even an aggressive and innovative bureau. SASS should be

"nationalized," or part of its funds should be drawn from central staff budget.

- (4) A mechanism for coordinating action and sharing lessons must be devised, especially now as other Regional Bureaus tool-up for sector programming. Otherwise the SASS initiative and other efforts will remain largely isolated. There also ought to be a stronger tie to the work going on at the World Bank.
- (5) Simultaneously, the Agency should strengthen its competence to perform less elegant sector analyses. Missions will continue to call for them, partly because of economic considerations, partly because AID officers question the superiority of the computerized approach. The drift in some professional circles in AID toward exclusive concentration on modeling appears to us to be premature. To too many of the other AID agriculturalists we interviewed it appears to be impractical. SASS can make a case for giving exclusive attention to experimental methodology: LA/DR, TA/AGR and most other units cannot.
- (6) TA/AGR should take a prominent role in improving the methodology of the traditional approach as well as the computerized approach. We recognize the assignment of responsibility depends on the general division of labor between TA, PPC, and the Regions, which has still to be decided. But, since improvements in the traditional approach will likely come with the progressive application of some of the skills associated with more rigorous analysis, skills that are not the exclusive property of model builders, it is sensible to keep the two methods-development functions together. We assume TA/AGR will have a major role in sector analysis and feel confident it can have a significant impact on the quality and utilization of standard analyses. The Agency has not been giving this job the attention it deserves. Joan Nelson in her 1966 report suggested that the Agency recruit forty-two specialists for this sort of work (in all sectors). Two or three were hired but turned to other tasks.
- (7) Whatever the methodology, the emphasis should shift from simple discrete studies to a continuing process of analysis.

- (8) The promoters of computerized models must try to document their case. In the attempt to extend the use of models the group ought not to press Missions and other operating units to accept the methodology on faith. The burden of proof properly belongs with the agents of change. Not enough time has been given to demonstrating the advantages, with examples drawn from the recent past, testifying to superiority over the more judgmental reports. One wonders whether the case can be documented at this time -- to the satisfaction of the skeptical decision-makers who rule the budgets. The proof should discuss not only the qualitative superiority of the rigorous analyses, but successful application, since their value to AID derives entirely from their influence.
- (9) Several other public relations jobs are called for, to publicize and familiarize. We feel that the tendency of some critics of model building, or of sector analyses in general, to criticize on grounds that do not seem to fit the facts as clarified in this evaluation is unconstructive. However, we feel these critics, who are propelled by something other than empirical evidence, must be persuaded rather than antagonized or ignored.
- (10) The campaign to promote the new guidelines on "sector analysis" should be practical, and not lift expectations or push Missions beyond what existing methodology allows. Our study indicates the Agency is not yet in a position to fully operationalize the guidelines. The efforts that Missions are likely to make to respond to the guidelines in the next year or so will probably have the same quality and use as the sample we observed. Since these efforts have improved upon earlier practice, the work should continue. But it should not be confused with the substantially improved methodologies we can anticipate, if the Agency handles the developmental job with the seriousness and resources it demands.

## Appendix A

## ANNOTATED LISTING OF SELECTED SECTOR STUDIES

TDY Studies

1. Congo/1968 Two man trip of about one month (2 man months). Final report entitled Getting Congolese Agriculture Moving, by C.E. Ferguson (AID) and W.I. Jones (USDA), dated May 1968.
2. Turkey/1966 Six man trip of about one month (6 man months). Final report entitled Prospects for Turkish Agriculture, by C.R. Elkinton (AID) et al, dated Dec. 1966.
3. Guyana/1969 Two man trip of about one month (2 man months). Final report entitled Evaluation Report, Guyana Agriculture Sector, by M. L. Cox and R. Newberg, dated Dec. 1969.
4. Dominican Republic/  
1969 Five man trip of about one month (4 man months). Final report entitled Evaluation Report, Dominican Republic, Agriculture Sector, by M. L. Cox, R. Newberg, et. al., dated June 1969. This was planned as a follow-on to the TDY sector study conducted in 1966. The latter involved a five man trip for about 1 1/2 months (6 man months). Final report was entitled Report of Study Team on Dominican Republic Agriculture, by E.D. White, M. L. Cox, et al., dated March 1966.

MISSION Studies

5. Korea/1967 This was a four step effort. A Mission task force determined the priority areas in agriculture. Mission economists and agriculturalists then prepared studies on each. A "Mission Evaluation Committee", which excluded the agricultural staff, then reviewed the findings. These three steps took about four months, starting late 1966, and an undetermined number of man months. Finally, a six man TDY team reviewed the reviews and the studies, during a two week period in April, 1967 (2 man months). Final report, including studies, reviews and TDY comments, entitled Rural Development Program Evaluation Report, by USAID (principal editor L.E. Holdcroft) and TDY team (led by A. Moseman [AID], principal editor E.G. Schiffman [AID]). A sector loan was not anticipated in 1966, and none emerged.

6. Costa Rica/1969 To prepare for a sector loan, two successive Mission Directors organized in-house and contract studies which, in their totality, would provide the analytical support. One of the early pieces, prepared by an Associated Colleges of the Midwest team resident in San Jose, was Analysis of the Agricultural Sector of Costa Rica dated 1969, with undetermined man month investment. The threads were not tied together except in the final loan documentation. See especially the Capital Assistance Paper for the loan entitled Costa Rica: Agricultural Development Program (515-L-022) for \$16.4 million (plus \$3.6 for a subsidiary, separate loan) signed June 1970. Total man months unknown. Total cost to USAID estimated at \$1 million.
7. India/1969 Starting in 1967, USAID submitted an increasingly detailed agricultural background statement as an annex to the annual Country Field Submission. Partly in response to pressure from AID/W, the calendar 1969 submission, entitled Long Range Agricultural Adjustment Analysis, (Annex F of the FY 1971 CFS) offered a major study of the implications of the Green Revolution. It did not purport to be a sector study, it did not offer recommendations, and it was not intended to provide the basis for a loan. In scope and depth it rivals other titles on this list. R.W. Cummings, Jr. was the principal author, working along with four Mission employed Indian economists and GOI staff. Cummings' total investment on this particular study, including the 1968 draft, was about 12 man months.
8. Colombia/1970 Starting in 1968, USAID has signed four successive annual, agricultural sector loans of \$15, \$15, \$15 and \$28 millions. Preparatory work in the Mission for each of the first three loans was not described as a sector study. In May 1970, after signing of the third loan, a two man TDY team visited for about a month (2 man months), to help prepare a sectoral presentation for the FY 1972 Country Field Submission submitted that fall (see Annex C, Agriculture, written largely by Witt and Atkinson [referred to on page 22 as the W-A report]). In early 1971 another TDY team arrived to help the Mission prepare

for the larger 1971 loan. The team included S. Daines, who on his return to AID/W has been instrumental in LA/DR/SASS in developing, with GOC collaboration, an input-output model for the country. The model is expected to provide a better basis for planning the fifth loan, which will be signed in 1972. We look on this experience since 1968 as a process, the first part, i.e. that which predates S. Daines and the model building exercise, taken collectively as one of the sample sector studies.

### CONTRACT Studies

9. El Salvador/  
1969 A study contracted to Nathan Associates in late 1968. Seven Nathan experts, with the support of 4 USDA TDY experts and GOES staff, worked for different periods over the next year (about 53 man months for the US participants). Total cost undetermined, partly because this study was authorized in an amendment to an earlier Nathan contract. The latter, including amendments, cost AID \$565,000. The final study report is entitled Agricultural Sectoral Analysis for El Salvador, Volumes I-IV, by R.R. Nathan Associates, dated Dec. 1969. It was not intended to prepare the way for a sector loan.
10. Guatemala/  
1969 A study contracted to Iowa State University in late 1968. Four ISU experts worked during a period of about six months (12 man months) in country, with USAID and GOG support. Study was financed through a series of obligating documents -- total cost between \$50,000 and \$100,000. Final report entitled Agricultural Development and Policy in Guatemala, by L.B. Fletcher, et. al., dated April 1969. It was intended, and used, as the major argument for the \$23 million Guatemala Rural Development Loan signed January 1970.
11. Ethiopia/  
1969 A study contracted to Stanford Research Institute in late 1966. Five SRI personnel on resident staff, starting Feb. 1967, and 19 SRI short term visitors. Draft of final report ready April 1969. Final Report entitled Development of Agriculture and Agro-Industry in Ethiopia, Strategy and Programs, by C.J. Miller et. al., dated December 1969. SRI refers to the study as an "agro-industrial

sector study." SRI estimates an investment of 144 man months. Total cost of contract was \$1.25 million. Altogether 18 subsidiary reports were printed, including Systems Analysis Methods for Ethiopian Agriculture, dated April 1968. A supplement to the final report provided PERT networks for the recommended projects. The study was intended to lead to specific credit worthy projects, (instead of a broad sector loan).

12. Nigeria/1969 A study contracted with the Consortium for the Study of Nigerian Rural Development (CSNRD) in late 1964. Four major U.S. universities involved (Michigan State, Kansas State, Colorado State and University of Wisconsin) plus USDA and other entities included in the Consortium and Ohio State U. working under subcontract. CSNRD estimates 30 professional man years (360 man months). Cost to AID of contract was about \$1.5 million. There are 33 printed reports, the last of which, the final report, is entitled Strategies and Recommendations for Nigerian Rural Development 1969/1985, by G.L. Johnson et. al., dated July 1969. In 1968, AID financed a separate contract with MSU to develop a simulation model of the Nigerian agricultural sector. The work was related to the CSNRD project, but not a component of it. A report on the MSU contract, entitled A Generalized Simulation Approach to Agricultural Sector Analysis with Special Reference to Nigeria, by T.J. Manetsch et. al., was published by MSU in June 1971. This latter contract cost AID \$350,000.

**Appendix B****COMMENTS FROM AID'S PROFESSIONAL COMMUNITY**

1. TA/AGR -- H.R. Jensen, A.J. Coutu, and F.L. Mann
2. AA/LA -- L.E. Harrison
3. SA/TCD -- E.G. Schiffman
4. SA/TCD -- F.J. LeBeau
5. LA/DR/SASS -- P. Robinson

Harald R. Jensen, Arthur J. Coutu and Fred L. Mann -  
Agricultural Economics and Sector Planning Division,  
Office of Agriculture, Bureau for Technical Assistance

The Rice-Glaeser report defines sector analysis as the "study of the principal socio-economic factors governing development of the sector, for the purpose of identifying manageable, integrated projects and policies with high pay-off." The report holds sector survey, sector study and sector review to mean, "approximately the same thing." (p.13).

We think that having all these terms mean the same thing led to a faulty basis for structuring the report and that some further clarification of the term, "analysis" can help in being more discriminatory in what is and is not called "analysis."

Analysis is a method of science. It is a division of any whole into its constituent parts; the term is always used in the sense that there is some principle(s) guiding the analysis. For example, the guiding principle in the analysis of the grammar of a sentence centers on the functions of the parts of speech in a sentence or the inter-relationships of these parts within the whole, the sentence. Furthermore, the aim of science is to gain understanding for the purpose of prediction and control, and analysis is the means toward this understanding.

In the analysis of a sector, then, the sector is the whole which is broken down into its constituent parts. In the economic analysis of a sector some well-defined allocative and distributive principles guide the analysis. Moreover, this guidance is normally expressed in numerical terms.

The aim of the economic analysis of a sector is twofold. First, the aim is to gain an understanding of how the economic systems or sub-systems within the sector operate and how these systems in turn are related to larger systems. The second aim is to determine through the analysis how one (the policy-makers, e.g.) can intervene with various policy options on the system so as to improve the sector's operation in terms of the nation's goals - output, employment, income, income distribution, nutrition, etc.

Thus, the economic analysis of a sector is basically concerned with specifying alternative possible solutions (policy options) and tracing out the expected consequences (numerically) of each option on the nation's goals.

This definition of economic analysis of a sector eliminates all but two or three of the efforts included for evaluation in the Rice-Glaeser report. Surveys, reviews, reports simply are not synonymous with analysis and hence should not be evaluated as analytical as is done by the Rice-Glaeser report. Surveys, reviews, reports are more fruitfully viewed as pre-analysis efforts. In this respect, sector reviews, reports and surveys should be viewed as a logical continuum of effort complementing analysis by contributing background information to analysis rather than as substitutes for analysis. In other words, the question to be answered is not whether a sector review or survey is better than a sector analysis (which the Rice-Glaeser report does) but how can they best be formulated to complement one another and be carried out in their proper sequence.

The concept of analysis outlined above would not have led to the statement on p.19 of the Rice-Glaeser report that, "most of the twelve 'analyses' [quotation ours] rely so much on ad hoc judgments and guesses that one has to have considerable faith in the intuitive abilities of the teams ...," because sector reports, reviews and surveys do by their nature rely to a large extent on judgments.

The second point we should like to make in regard to the Rice-Glaeser report concerns their evaluation procedure. Rice-Glaeser, too, are bothered by this procedure, because on p. 21 they say that, "this highly subjective assessment leaves us where we were before ..." Actually, it is difficult to see how they could have arrived at any different conclusion on evaluation. As they had indicated earlier, most of the efforts selected for evaluation relied on judgment and guesses and for this reason their assessment could hardly be anything but subjective.

If, on the other hand, one proceeds from the concept of the "economic analysis of a sector" used here, then one can avail himself of more objective criteria for evaluation.

The major quantitative analytical techniques used in the economic analysis of a sector essentially boil down to simulation, mathematical programming and input - output analysis. Numerous objective criteria are available for evaluating the use of these techniques - goodness of fit tests, sensitivity tests, testing of assumptions, coefficients, etc. However, to evaluate with

these criteria requires professionals who are skilled in the use of such analytical techniques. Moreover, if one includes "application of the analytical results" among the criterion for evaluation, then one must confer with policy makers of countries where the analysis takes place.

We do agree with the conclusion of the Rice-Glaeser report that there is a need for a more sophisticated type of approach to sector problems than provided by the bulk of the efforts they examined in their report. We also agree with the importance they attach to "built-in mission involvement" (p. 24), but, given the turn-over in Mission personnel, more important in regard to adoption and implementation of the results of sector analyses is LDC involvement. In addition, from the standpoint of institutionalizing or operationalizing the capacity to do sector analysis in LDC's, it is paramount that LDC personnel be involved, not peripherally, but as full and joint participants in the various stages from conceptualization, through analysis and implementation.

Lawrence E. Harrison  
Office of the Deputy U.S. Coordinator  
Bureau for Latin America

I have read with great interest your final report, which I think is a very useful one and which I hope will get broad distribution. The report underscores what is for me an increasing cause for concern: the divorce of agricultural sector analysis from agricultural sector policies, resource allocation, and administration. I am, to be sure, a prisoner of my own experience in which analysis and programming were part of a single process. However, as I reflect on that process, and on the generally successful -- thus far -- execution of the program which flowed from it, I incline toward the view that our standard approach should embrace both. In addition to the obvious waste when analysis goes unused, I am influenced toward my inclination by the awareness that a government is likely to take the analysis much more seriously -- and in the process build a greater constituency for its results -- if it believes it is working toward a major new infusion of external resources.

To be sure, there are some countries where the leadership is both sufficiently responsible and modern that the incentive of substantial external resources may not be necessary. Of these relatively few cases, there may be some in which national resources, particularly the capacity for self-finance; investment, are sufficient to respond to the opportunities and fill the needs illuminated by sector analysis/programming. In the large majority of cases, however, at least in Latin America, the incentive effect of a sector program is likely to be highly important.

In this connection, I am sorry that the report does not highlight the need for a discriminating approach to sector programming according to each country's level of sophistication, in the agricultural sector in its totality and its component institutions. In Latin America, it seems to me, there are two kinds of countries for purposes of agricultural sector analysis/programming: (1) a relatively advanced -- and small -- group who have experienced continuity and discipline in development planning and who, often with earlier U.S. technical assistance, are already engaged in integral agricultural sector analysis and programming (e.g., Colombia, Mexico, perhaps Brazil); and (2) a much larger number of countries which have yet to undertake comprehensive analysis, where the several institutions in the agricultural sector operate largely independent of one another, and where a coherent agricultural strategy and policy do not exist. In the former case, the most important role of the donor institution is to help expose country planners to relevant experience elsewhere, to the newest techniques of analysis, and to the valuable probing which can be expected from an informed, professional, disinterested entity. In the latter case, the function of the donor institution is decidedly different: whereas in the former the process has already been started and the donor's function is essentially one of fine tuning, in the latter his function may well be

one of getting the process started. To accomplish this quite different and in some ways more difficult purpose, the donor need not search for the degree of comprehensiveness and sophistication that he would in the countries where the process is already in motion. Since the sector analysis/programming process should almost automatically lead to continuing reexamination and refinement of data, assumptions, policies, and programs, the galvanizing function in the second group of countries can -- and perhaps should -- settle for a first approximation.

I would argue that, for countries in the second group, at least for those countries that have received substantial technical assistance in agriculture for some time, chances are that there are many of the pieces of necessary analysis already resting on dusty shelves. A cataloging of these pieces, an effort to identify significant gaps in data, and a further effort to fill these gaps may well lead to that first approximation necessary to start the apparatus. If this effort involves the recipient directly and carries with it the promise of substantial external resources (here the "critical mass" concept has plenty of relevance), you have, it seems to me, the ingredients necessary for combustion. To introduce sophisticated models and data manipulation at this point in time might well prove to be counterproductive.

Permit me to take a little umbrage at the two sentences which follow "(a) Determined and purposeful Mission management of the study" on page 23. I did not have a "general action program already in mind." What I had in mind was the belief, based on the results of our piecemeal agricultural programming in the Dominican Republic, that the best way to do agricultural programming was in a sectoral context. To be sure, I had some of the basic elements (e.g., technical assistance, credit, education, coops) in mind, but these are elements which are likely to be found in most programs. The actual design of the program evolved out of the analysis and the combined experience of our Costa Rican-U.S. steering group which I chaired. But the study was not "directed," by which I infer you mean that it was designed to authenticate a preconceived notion of what should be done.

Edward G. Schiffman  
Local Development Division  
Office of Technical and Capital Development  
Bureau for Supporting Assistance

The saying that nothing is ever quite like it seems or is imagined might well forewarn any attempt to appraise the relative merits or demerits of short-term sector analyses versus the most advanced computerized sector models. Having said this I am nonetheless committed to make some comments regarding the pros and cons of the two approaches.

Highly sophisticated computerized sector models are increasingly becoming the fashionable approach to sector analyses, especially among younger academicians in the economically developed countries and particularly among those in the U.S. But what does this tell us as regards the usefulness of the approach in the identification and solution of problems in the DCs.\* Probably very little indeed, at least as long as AID finances such analyses at no cost to the DC's or to the universities and the private sector.

Under the circumstances that are widely prevalent in the developing countries (highly inadequate data, serious shortages of skilled technicians, frequent changes in key personnel, relatively simple economies, limited resources vis-a-vis numerous and obvious impediments to economic and social progress, etc.) there is much to be said in favor of the short-term, traditional type of sector analysis vis-a-vis the computerized model approach. Specifically:

1. Time -- short term sector analyses on the average can be done in probably not more than 10% of the time (2-3 months versus 2-3 years) required for computerized model studies. With rapidly changing technology, prices and markets, political alliances, etc., many of the findings of a 2 or 3-year study may be out of date before the study is published. The frequent changes in political leadership that characterize most developing countries does not augur well for most lengthy studies even if other conditions remained constant. Valuable time may also be lost while waiting for the results of the computerized sector model.
2. Cost -- short term sector studies are likely to cost only a fraction as much as computerized sector models with the latter sometimes costing several hundred thousand dollars.
3. Ease of Understanding -- Mathematical and other techniques involved in computerized sector models are rarely understood by more than a half score of people in many DCs and these are unlikely to be the decision makers. And what people do not understand they may well be skeptical of. The approach may

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\*DC = developing countries

thus be self-defeating.

4. Problem Identification and Solution -- short-term experts working with DC nationals can usually identify the most important deterrents to development within a sector and propose solutions thereto in a matter of 2 or 3 months. In all probability they will identify a much larger number of important problems than there is any hope of solving given the resources available to the DC. Under the circumstances which prevail in most DCs it is doubtful that the computer approach to sector analysis will pay off in terms of the number of problems identified and the number that are actually solved.

In attempting to appraise the usefulness of computerized sector models in the DCs the question should be raised as to why the approach has not been used more extensively in the developed countries, e.g., the U.S. The U.S. has a vast reservoir of good data, large numbers of people who understand the techniques involved, and all the necessary hardware, and yet relatively little or no use is being made of this approach in the agriculture sector in the U.S. One sometimes gets the impression that AID is experimenting with techniques in the DCs that no one is willing to use or finance in the U.S.

While generally favoring short-term sector analyses over computerized models under current DC conditions and the present "state of the art," continued experimentation on a limited basis with computerized sector models is justified. Certainly in the long-run the computer model approach will be much more extensively used, especially as the quality and quantity of data improve and as the process becomes more widely understood and perfected. Inherently, it has the potential of offering the decision makers a vastly expanded number of options, of reducing the element of human bias, and of speed and continuity once the "system" has been installed, that the traditional approach to sector analysis does not have.

Francis J. LeBeau  
Agriculture Division  
Office of Technical and Capital Development  
Bureau for Supporting Assistance

This review of selected efforts to make "sector studies" of the agricultural sector is most appropriate at this time. It brings to light what has increasingly become a chronic feeling among some agricultural officers: that AID programming in agriculture has been based more on personal inclination and preconceived notions than on systematic study and analysis of situations which AID programs are designed to correct. Yet the majority of the studies and analyses could hardly be called responses to a felt need for greater objectivity and analysis, and consequently fall far short of measuring up to what sector analysis is all about. Most of the studies used in the evaluation review were made for more specific purposes; each in its own way a response to a specific question and not for some generalized objective on which agreement could be reached within any large group as being the purpose of sector analysis.

In other words by and large the same sort of bias and preconceptions which have characterized the choice of projects also characterize the purposes and approaches used to date for the most part in making so called sector analyses. It is therefore not surprising that the many individuals whose views were sought in attempting to evaluate the selected studies had such divergent views with respect to the value of these studies.

Of the several criteria used to measure "success" of the several studies, utilization is perhaps the most objective. But even here there is much room for debate as to what constitutes utilization. In the first instance a sector study should not simply result in the production of a report with recommendations which may or may not be used. Rather a sector study should establish a system of disciplined inquiry which becomes a continuous process which at any given time can be used to provide answers to specific questions for which answers are needed in making policy decisions. This, of course, requires active participation of the host country from the beginning.

The review made of the 12 selected cases provides no real insight as to the relative effectiveness of the different methodologies in accomplishing this objective. The argument on methodology appears to revolve around the choice between two general approaches: (a) the traditional paper and pencil exercise, and (b) the use of computerized mathematical models. Since there are no good examples of either for making comparisons the argument becomes more theoretical than real. For that reason continuation of the argument is rather futile. A number of studies under sponsorship of AID as well as by others are now

in process which should permit comparison of methodologies.

In the meantime there would seem to be an opportunity for doing useful work without necessarily having a better proven method. At this stage, perhaps more important than method, is the attitude with which we and cooperating countries approach sector studies. If in doing sector studies a system of disciplined inquiry is established and becomes utilized in the decision making process much will have been accomplished regardless of the degree of sophistication of the methodology. This accomplished, the greater the capacity of the method to deal in quantifiable terms susceptible to computer manipulations the more useful will be the results since the array of variables which can be dealt with will be much larger. At the same time, however, the interpretation of results from the sophisticated mathematical models must be made against a background of good horseback knowledge and intuitive judgment. Thus, there is a role for both the computerized model and intuitive judgment.

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In discussion of methodologies for sector analysis there is a danger, I think, of being misled by false dichotomies -- distinctions which are wrongly looked upon as mutually exclusive or in necessary opposition. Perhaps one of the most misleading dichotomies: quantitative vs. qualitative. Too often there is the assumption that "the more quantitative" the better, and "the more qualitative" the worse. Leaving aside the difficulty we might have in explaining what we mean by "more quantitative", this crude or simplistic principle seems to overlook the fact that what we "quantify" are things qualitatively distinguished from one another. Were maximum "quantity" and minimum "quality" an index of the degree of science obtained then mathematics would be the only pure science -- since it has no qualitative elements. Of course, mathematics is not an empirical science. Mathematical systems are deductive: logical developments of premises, the "truth" or "falsity" of which is not a consideration. This is why a given mathematical system can and is developed from premises which contradict those of another system; each of which can be used for specific purposes.

Mathematics, as such, is not empirical. It is, however, a major tool of empirical inquiry -- perhaps the major one. Sector analysis should therefore take this into account, and, at the same time, avoid pursuing mathematical formulations and techniques for their own sake, i.e., regardless of whether or not their application to the existential subject matter in question is fruitful.

The development of sector analysis will be hindered if discussion is drawn into crude, misleading dichotomies or false issues, such as quantitative vs. qualitative, computerized vs. traditional, judgment vs. analysis. If we recognize that we are attempting to develop new procedures, or new ways of using established procedures, for dealing with social phenomena, and that we are just beginning, we may, I think, avoid the mistake of splitting into two hostile camps and wasting all our energies in battle. Whether or not we use the computer is no longer a methodological issue, but, rather, how to use it. The first question is: what sort of an analysis will contribute most to an explanation and a solution of the sector's problems? Questions concerning the extent and nature of computerization should follow that determination.

There is a confusion on the other side, so to speak, which I think is also worth mentioning here, i.e., the tendency to identify or correlate the difficulty and complexity of a methodology with its scientific validity. Obviously, it is much more likely that an

unwarranted identification of this sort will be made by academicians, than A.I.D. personnel. As academicians become interested we may find it necessary to oppose their support for, say, simulation, simply because it is a more complex technique, and wrongly leads them to the conclusion that it is therefore better science. It may be, and then, again, it may not. As I understand it, this is an open question with proponents now having the burden of proof. Perhaps an excessively passive and visual conception of knowledge, and the related widespread use of the unfortunate term "model", have helped confuse us somewhat -- so that analytical techniques, involving actions or ways of behaving, are wrongly interpreted as "pictures of reality". To view input-output, linear programming, econometrics and simulation as different kinds of analytical techniques, with varying purposes, characteristics, and, perhaps, effectiveness, rather than as "models" of the sector, will help us in avoiding false issues.

The proof is in the pudding. The attempt to improve sector analysis is aided, I think by placing it in the wider context of the sector approach, with its cyclical process of analysis, strategy, program design, implementation, evaluation, re-analysis, revised strategy, etc. How good was the analysis and the analytical techniques employed? The final test of scientific validity is neither conceptual simplicity nor complexity, but accuracy in predicting and controlling events. A basic feature of the sector approach, as we have defined it in the LA Bureau, is the development of procedures for observing and measuring the effects or impacts of programs, anticipated or otherwise. When such procedures are in operation (and they are now being installed in Colombia) I think we will have the instrument we need for testing and refining our analytical techniques.