

A.I.D. EVALUATION SUMMARY PART I

(BEFORE FILLING OUT THIS FORM, READ THE ATTACHED INSTRUCTIONS)

PD-ABA-760

65615

A. REPORTING A.I.D. UNIT:
USAID/Guatemala
 (Mission or AID/W Office)
 (ES# 88-13)

B. WAS EVALUATION SCHEDULED IN CURRENT FY ANNUAL EVALUATION PLAN?
 yes slipped ad hoc
 Eval. Plan Submission Date: FY 87 4th.

C. EVALUATION TIMING
 Interim final ex post other

D. ACTIVITY OR ACTIVITIES EVALUATED (List the following information for project(s) or program(s) evaluated; If not applicable, list title and date of the evaluation report)

Project #	Project/Program Title (or title & date of evaluation report)	First PROAG or equivalent (FY)	Most recent PACD (mo/yr)	Planned LOP Cost ('000)	Amount Obligated to Date ('000)
520-0255	Small Farmer Diversification Systems Project	9/29/81	12/31/87	\$6.6M	8,109,135

E. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

Action(s) Required

- * AID should continue its involvement in agricultural diversification in the Guatemalan highlands.
- * The follow-on project should focus on commercialization of small holder agriculture, improving credit recovery, and testing/adapting/validating new technology. Specifically the follow-on project should address the following issues:
 - a) Marketing should be recognized as the key element of diversification.
 - b) Research should be based on ICTA's FSR/E approach.
 - c) The project should adopt the PROGETTAPS model for establishing research/extension linkages.
 - d) BANDESA should be strengthened with logistic support and its efforts should emphasize loan recovery.
 - e) Technical assistance personnel should be attached to designated MAGA institutions.
 - f) Administrative training in MAGA and AID procedures should be provided for all MAGA administrators concerned with the project.
 - g) Funding procedures should be more flexible.

Name of officer responsible for Action

Mission Mgmt
 HADS II Project Development Committee

Date Action to be Completed

Continuing HADS II
 8/88

(Attach extra sheet if necessary)

F. DATE OF MISSION OR AID/W OFFICE REVIEW OF EVALUATION: mo 11 day 10 yr 87

G. APPROVALS OF EVALUATION SUMMARY AND ACTION DECISIONS:

<p>Project/Program Officer Signature Typed Name: <u>Edgar Pineda</u> Date: <u>3/9/89</u></p>	<p>Representative of Borrower/Grantee Date: <u>07-31-89</u></p>	<p>Evaluation Officer Date: <u>08-25-89</u></p>	<p>Mission or AID/W Office Director Stephen Wingert DDIR Date: <u>8/29/89</u></p>
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A. J. Castrucci
 Mission Director

H. EVALUATION ABSTRACT (do not exceed the space provided)

The small Farmer Diversification Systems Project is a joint effort of the government of Guatemala's public agricultural sector and AID to assist small farmers in the Western Highlands of Guatemala through the promotion of nontraditional, improved agricultural and livestock technologies. The purpose is to strengthen the capacity of the public agricultural sector to stimulate small-farm diversification from basic grains to other crops of higher value that require greater labor intensity.

The project has been implemented by the regional staffs of four organizations—the Instituto de Ciencia y Tecnología Agrícola (ICIA), the Dirección General de Servicios Agrícola (DIGESA), the Dirección General de Servicios Pecuarios (DIGESEPE) and the Banco Nacional de Desarrollo Agrícola (BANDESA). They have been assisted by a Equipo de Asistencia Técnica (EAT) comprised of Guatemalan and U.S. technical advisors.

This final evaluation was conducted by a four person team fielded by Associates in Rural Development on the basis of a review of project documentation, discussions with USAID and GOG implementing agencies, and trips to field sites in Region one. The purpose of the evaluation was to identify and assess the project's achievements in terms of the outputs and goals defined in the PP and annual plans, to identify shortcomings in the original project design, to analyze lessons learned, and to recommend appropriate follow-on activities. The major findings included:

The PP had several design flaws that limited the project's performance, the most serious being: 1) Lack of a marketing component; 2) priority on production targets when the institutional capacity necessary to achieve such production had not yet been created and research results were not yet available for extension; 3) disregard of ICIA's institutionalized farming systems approach in what was supposed to be an institution-building project; 4) unclear definition of EAT's role, which allowed it to become a separate institution; 5) inappropriate "farm models" approach; 6) overambitious farmer surveys of little operational value.

Nevertheless, the evaluation team concluded that this was an institutionally ambitious project that aimed to coordinate the activities of four MAGA agencies in a degree never attempted before. Its progress in this respect was encouraging, particularly given the problems (many which they felt could have been avoided) mentioned above. It was calculated that the project had achieved 60% of its targeted output, with an internal rate of return during the LCP of 15%. The project is now entering a mature phase where the main problems are second generation and concern marketing and credit recovery rather than production.

Principal recommendations from the evaluation report are: 1) AID should continue its involvement in agricultural diversification in the Guatemalan highlands; the project should remain the Region I. 2) The follow-on project should not be a pilot project, and should focus on commercialization of small holder agriculture, improving credit recovery, and testing/adapting/validating new technology. 3) Marketing should be recognized as the key element of diversification. INDECA should become a participating agency. 4) Research should be based on ICIA's FSR/E approach. 5) The project should adopt the PROBTAPS model for establishing research/extension linkages. 6) BANDESA should be strengthened with logistic support and its efforts should emphasize loan recovery. 7) Technical assistance personnel should be attached to designated MAGA institutions. 8) Administrative training in MAGA and AID procedures should be provided for all MAGA administrators concerned with the project. 9) Funding procedures should be more flexible.

I. EVALUATION COSTS

1. Evaluation Team		Contract Number <u>QR</u> TDY Person Days	Contract Cost <u>QR</u> TDY Cost (US\$)	Source of Funds
Name	Affiliation			
Ittil Asmon	ARD, Inc.	36	\$57,660.00 total	PD&S
Michael Schwartz	ARD, Inc.	36		
Jim Jones	ARD, Inc.	41		

2. Mission/Office Professional
Staff Person-Days (estimate) 12

3. Borrower/Grantee Professional
Staff Person-Days (estimate) 10

A.I.D. EVALUATION SUMMARY PART II

J. SUMMARY OF EVALUATION FINDINGS, CONCLUSIONS AND RECOMMENDATIONS (Try not to exceed the 3 pages provided)

Address the following items:

- Purpose of activity(ies) evaluated
- Purpose of evaluation and Methodology used
- Findings and conclusions (relate to questions)
- Principal recommendations
- Lessons learned

Mission or Office: ORD/USAID/Guatemala

Date this summary prepared: 3/9/89

Title and Date of Full Evaluation Report: Small Farmer Diversification Systems Project (520-0255)
Final Evaluation - October 30, 1987

I. Purpose of the Activity or Activities Evaluated

The Small Farmer Diversification Systems Project is a joint effort of the Government of Guatemala's public agricultural sector and AID to assist small farmers in the Western Highlands of Guatemala through the promotion of nontraditional, improved agricultural and livestock technologies. The purpose is to strengthen the capacity of the public agricultural sector to stimulate small-farm diversification from basic grains to other crops of higher value that require greater labor intensity.

II. Purpose of the Evaluation and the Methodology Used

The objectives of this final evaluation were:

- compare the inputs (e.g., funds, equipment, technical assistance), outputs, purpose (institution building), subgoal (production) and goal (income, employment and nutrition improvements) achieved with those envisioned in the PP and annual operating plans;
- identify any shortcomings in the original conception of the project and its implementation;
- determine project achievements;
- analyze lessons learned from this innovative project;
- recommend appropriate follow-on activities.

The evaluation was conducted by a four-person team from Associates in Rural Development during the period September 6 to October 17, 1987.

Note: the evaluation methodology was not described in the evaluation report.

III. Findings and Conclusions

The major findings of the evaluation are discussed below in accordance with the respective objectives established for the final evaluation.

A. Project Impact at the Farm Level

The project had a significant positive impact on its beneficiaries. Both "Sondeo" and survey results show qualitative differences between beneficiary and non-beneficiary farms in on-farm capital investment, available working capital, agricultural investments, volume and variety of commodities produced, diversity of economic base of the household, and net income. Project beneficiaries had higher levels than non-beneficiaries in all categories. Differences between beneficiary and non-beneficiary groups could not be statistically quantified because of survey deficiencies.

The project achieved 35% of the original target for small-scale irrigation, 114% for soil conservation target, 35% for vegetable production, 120% for fruit tree production, and 58% for livestock modules. The evaluation team computed an overall weighted achievement rate of 60%, with an IRR of 15% for the life of project.

B. Shortcomings in Project Design

The evaluation team indicated that the PP failed to adequately address a series of design concerns, including:

1. minimal involvement of Guatemalan authorities in the PP design. This resulted in ignoring ICTA's established and well-known farming systems research/extension (FSR/E) approach within an explicitly identified FSR/E type project.
2. lack of a marketing component. Original assumptions that the "marketing infrastructure" provided under AID Project 520-0238 was in place and operating proved to be entirely unrealistic, resulting in serious marketing constraints, limitations in expansion of vegetable production, and defaults on project loans.
3. insufficient personnel and logistic support for BANDESA. Consequences are overextended bank capacity and projected loan default rates of 35%.
4. development of poor indicators for the project purpose of institutional development. The use of production output as a measure of institutional development led to an emphasis on extension activities before tested technologies were developed or available.
5. inadequately defined roles for the technical assistance team. This led to a semi-autonomous group independent of the Government of Guatemala agencies.
6. conflicting sets of roles and responsibilities between the coordinating unit and the regional implementing agencies.
7. inadequately funded technology validation and testing activities.
8. an overly ambitious and inappropriate baseline survey that was unable to guide research on diversification systems.

C. Project Implementation Problems

The evaluation report indicated that the project started up very slowly, and saw its potential effectiveness further diminished by frequent changes in leadership within the Ministry of Agriculture, ICTA, DIGESA, and USAID. Insufficient definition of authority and responsibilities placed the AID-contracted project coordinator in conflict with the regional directors of DIGESA, ICTA, BANDESA, and DIGESEPE, thereby reducing his overall effectiveness. Lack of familiarity with AID procedures by the Coordinating Unit resulted in delays in procurement of equipment and construction of buildings to house laboratories, a training center, and other infrastructure.

Poor communications exacerbated the above problems. Failure to provide a Spanish translation of the PP to the regional authorities resulted in a two-year delay in their understanding of the project. This situation was compounded by early lack of leadership and guidance from the USAID Project Manager, particularly with respect to USAID procedures. The overall effect was a management team not adequate to starting up an innovative project requiring cooperation among public agencies traditionally used to competing among each other.

Finally, failure to adjust the Quetzal budgets following devaluation led to underfunding of some project items (notably credit for small-scale irrigation projects), and incomplete disbursement of loan funds.

D. Strengthening Public Agricultural Sector Capacity

Despite the implementation problems cited above, the evaluation team felt that the project had produced important institutional developments. These included:

1. current support for the project's goals from high-level MAGA administrators.
2. the COREDA in Region 1 is working well and considered the most effective in the country.
3. the implementing agencies have learned how to effectively administer AID financing.

4. the establishment of research units for livestock, vegetables, and fruit in ICTA.
5. an increase of extension activities in fruit and vegetable production in DIGESA.
6. the integration of animal production into DIGESEPE's traditional veterinary program, the supervision of livestock credit, and a reorientation toward livestock farm management.
7. the incorporation within BANDESA's traditional loan portfolio of diversification loans for fruit, vegetables, livestock, soil conservation, and small-scale irrigation activities. Significant staff resources are devoted to these loans.
8. the involvement of INDECA in fruit and vegetable marketing even though it was not a participating agency in the project.

E. Research and Technology Adaptation

The evaluation team was critical of the project management ignoring ICTA's expertise in FSR/E and developing a new approach to FSR/E based upon model farms and extremely complex systems of enterprise diversification within farms. Consequently, technology validation and testing were underfunded and underemphasized. Nevertheless, the evaluation report identified the following important research achievements:

1. livestock research unit was established at ICTA.
2. DIGESEPE has developed and is promoting techniques for feeding livestock with crop residues and for composting livestock residues.
3. ICTA has developed a technology for fruit drying and storage that is being promoted by DIGESA.

F. Farm Surveys

Given the significant amount of resources invested in the large and numerous farm surveys, the evaluation team felt that this was an activity with extremely marginal returns. They discounted virtually all results from the formal surveys and placed greater confidence on the ICTA "Sondeo". Even here, the analysis of data was judged superficial and of limited use.

G. Research/Extension Linkages

Despite past tensions between ICTA and DIGESA, present relations were found to be "unusually good", though not formally structured. Relations between ICTA and DIGESEPE were described as excellent. The team also found that the formal link established between ICTA and DIGESA by the PROGETTAPS project, as exemplified in the Quetzaltenango team, was satisfactory.

H. Family and Youth Development

Project activities to improve family nutrition and to teach the younger generation new or improved agricultural practices through 4S clubs merely served to complicate project efforts and blur its focus.

I. Credit

The evaluation report notes that important changes in BANDESA's policy have greatly increased small- and medium-scale farmer access to credit, increasing the probability that AID's and BANDESA's client population are similar. While credit procedures are still too complex, the existence of multi-cycle loan approval is a sign of increasing flexibility. Credit targets stress quantity over quality. This, in conjunction with overextended BANDESA staff, results in poor client screening and supervision and high credit default rates.

Input availability was judged to be satisfactory with the exception of vegetable seed. This situation is expected to improve once the market conditions for varieties and quantities has stabilized.

J. Marketing

Lack of a clearly defined public sector role in the marketing of fruits and vegetables resulted in poorly conceived activities by CORSEPE and conflicts with INDECA. INDECA has made a promising entry into vegetable marketing in Region 1, but needs policy guidelines defining its role in disseminating market information, organizing market groups, supervising grades and standards, and refraining from price setting. Marketing technical assistance was provided only in late 1986. In the absence of a role definition for INDECA and in the need to dispose of saleable produce, the technical assistance team did not work with INDECA.

K. Technical Assistance Team

The creation of the technical assistance team (EAT) as a semi-autonomous entity did not serve the project's goal of institution building, causing bitterness with ICTA, and demands from Guatemalan agencies that the technical assistance be assigned to specific institutions. USDA's home support of the EAT team was found inadequate, leading to prolongation of problems. Performance in the areas of data analysis and training needs assessment were judged to be the least satisfactory of EAT's activities.

The hiring of advisor's counterparts for EAT technical assistance produced poor results. Conflict between counterparts and technical assistance or public sector counterparts developed, and any knowledge acquired was not institutionalized. In contrast, the hiring of a national professional as an advisor in his own right produced good results.

L. Training

Structured training efforts began only in 1986, and focused primarily on the development of manuals and other materials. Only late in the project was a serious training master plan developed. Under pressure from USAID, a series of in-service training programs were conducted, but their impact on project objectives could not be substantiated. Only two of the originally eight designated long-term training slots were filled, both by ICTA.

IV. Lessons Learned

This institutionally ambitious project aimed at coordinating activities of four MAGA agencies to an extent never before attempted. Its progress was judged encouraging because, despite its shortcomings in design and implementation, the project has achieved considerable gains by responding to felt needs and opportunities in Region 1.

Given all their faults, DIGESA and DIGESEPE -- the two extension services -- were assessed as being the strongest components of the diversification effort. The weak links in the project are the lack of marketing for new products, limited research capacity for testing, adapting and validating new technology for vegetable, fruit, and livestock production

K. ATTACHMENTS (List attachments submitted with this Evaluation Summary; always attach copy of full evaluation report, even if one was submitted earlier)

1. Attachment 1, Full Evaluation Report
2. Attachment 2, Scope of Work for Evaluation Team

ATTACHMENTS

L. COMMENTS BY MISSION, AID/W OFFICE AND BORROWER/GRANTEE

The evaluation fulfilled the demands of the scope of work. The evaluation team had extensive past experience in Latin American natural resource management and credit, thereby enabling it to draw upon scarce project baseline information and outside impact data to draw valid conclusions and recommendations. While believing that questions relating to the scope, quality, and form of technical assistance remain open issues, the Mission and the implementing organizations concur with the overall accuracy of the evaluation and are committed to implementing the recommendations.

MISSION COMMENTS ON FULL REPORT

Principal Evaluation Recommendations and Mission Response

Evaluation Recommendation

Mission Response

A. Future of the Project:

- | | |
|---|---|
| 1. AID should continue its involvement with agricultural diversification in the Guatemalan highlands. | Mission agrees and is emphasized in Agricultural Strategy officially adopted in February, 1988. |
| 2. The follow-on project should remain in Region I. | Emphasis for follow-on project is still Region I but other new areas will be incorporated. |
| 3. It should focus on commercialization of small holder agriculture, i.e., marketing, improved credit recovery, and testing, adaptation and validation of new technology. | This is the focus of the follow-on Project. |

B. Institutional Structures

- | | |
|--|--|
| 1. COREDA should be recognized as the highest regional authority for the project. | Incorporated into Phase II. |
| 2. The Comité Sub-Regional de Desarrollo Agrícola (COSUREDA) should be strengthened through higher-level support to assure coordinated implementation of diversification activities at the subregional level. | Incorporated into Phase II. |
| 3. An Unidad Regional de Planificación (URPA) (a regional agricultural planning unit within the Unidad Sectoral de Planificación para la Alimentación y el Desarrollo Agrícola (USPADA) should be established in Region I. | Will be done with PL 480 Title I local currency. |
| 4. The Unidad de Coordinación para el Proyecto de Diversificación (UCPRODA) should remain a project-specific unit that is strictly responsible for facilitating administrative and financial matters concerning AID-assisted diversification activities. | Incorporated into Phase II. |

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- | | |
|--|---|
| 5. Marketing should be recognized as the key element of diversification and the public sector's role clearly defined. | Mission agrees and incorporated into follow-on project. |
| 6. INDECA must become a participating agency in the project and be recognized as the Government of Guatemala regional authority for assisting with product marketing. | Completed. |
| 7. CORSEPE should act as a regional committee for coordinating produce marketing but not as an implementing agency. | Incorporated into Phase II. |
| 8. Interinstitutional subject-matter teams for vegetables, fruit trees and animal production should be given more authority for planning and coordinating the implementation of annual programs in their respective areas. | Will be done on informal basis. |

C. Research and Technology Adaptation

- | | |
|--|--|
| 1. ICTA's FSR/E approach should be accorded a place appropriate to project and sector needs, and ICTA given a corresponding position in the project. | Completed. |
| 2. Technology validation and testing should receive adequate funding. | Completed. |
| 3. Integrated Pest Management (IPM) should be the focus of vegetable research. | HADS environmental amendment will incorporate. |
| 4. The socioeconomic aspect of ICTA's research in Region 1 should be strengthened. | Incorporated into new ICTA medium term plan. |
| 5. Livestock research should concentrate on small animals rather than bovines. | Incorporated into new ICTA medium term plan. |
| 6. Research on postharvest storage of fruits and vegetables should be strengthened as well as work on controlling product quality. | Incorporated into new ICTA medium term plan. |

7. All on-farm trials in the region should be coordinated and monitored by ICTA. Incorporated into new ICTA medium term plan.

D. Surveys

1. Large farm surveys measuring impact should be abandoned in favor of (a) rapid assessment "Sondeos" and (b) assistance with periodic surveys of the National Statistics Institute (INE) or USPADA's statistical office. Baseline survey incorporated into Phase II.

E. Research/Extension Linkages

1. The project should follow PROGETTAP's model for establishing research/extension linkages. Incorporated into Phase II.
2. On-farm validation and testing of vegetable species and varieties should be conducted mostly by DIGESA under ICTA's supervision. Incorporated into Phase II.
3. ICTA and DIGESA should meet regularly on program direction to coordinate activities. Incorporated into Phase II.

F. Extension and Technology Transfer

1. DIGESA should concentrate its efforts on training guias agricolas and representantes agropecuarios, and their supervision by extension agents. Incorporated into Phase II.
2. Diversification on farms should be de-emphasized in favor of diversification among communities. Incorporated into Phase II.
3. The safe use of pesticides should be emphasized. HADS Environmental Amendment to be completed 4/89
4. Radio programs should use indigenous languages to convey messages on pesticide safety, soil conservation measures, and economic incentives for following recommended practices. Incorporated into Phase II.

5. DIGESEPE should continue to redesign livestock units to make them more economically viable, and to concentrate on women in indigenous areas, where small animal management is a women s task. Incorporated into Phase II.
6. The 4S and home economics component of the project should be discontinued. Completed

G. Credit

1. BANDESA should receive significant Government of Guatemala personnel and logistical support to ensure recovery of present diversification credits and the continuation of the loan program. Incorporated into Phase II.
2. Greater flexibility should be given to regional credit officials to shift credit funds among categories so that credit resources can be allocated to commodities in greatest demand. Incorporated into Phase II.
3. Credit targets should stress quality rather than number and amount of loans. Incorporated into Phase II.
4. The loan process should be streamlined and the credit applications simplified. Incorporated into Phase II.
5. The recommendations of the credit study regarding the treatment of delinquent loans should be implemented. Incorporated into Phase II.

H. Marketing

1. A policy statement of the public sector's role in marketing perishable products is urgently needed. Incorporated into Phase II.
2. INDECA's structure and legal base cannot be ignored when determining the public sector's role in marketing. Incorporated into Phase II.

3. DIGESA's priority roles in produce marketing should be production forecasting, recommending marketable varieties, phasing planting to avoid market gluts and promoting on-farm storage. Incorporated into Phase II.
4. BANDESA should extend credit to the private sector for creating marketing infrastructure. Incorporated into Phase II.

I. Technical Assistance

1. Technical advisors for any future diversification activities should be attached to specific regional agricultural institutions. Incorporated into Phase II.
2. Scopes of work for all technical assistance should be worked out with the full participation of COREDA, as should the selection of advisors. Incorporated into Phase II.
3. Expatriate technical assistance should be oriented more toward short-term assignments that focus on specific technologies or problems. Incorporated into Phase II.
4. Assistance in export marketing should be located in Guatemala City. Incorporated into Phase II.

J. Training

1. A master plan for training should be prepared. Incorporated into Phase II.
2. If the PROGETTAPS type research/extension linkage is adopted, ICTA, DIGESA, and DIGESEPE technicians should be trained in FSR/E and effective communications skills in the rural milieu. Incorporated into Phase II.
3. Short-term training should be available according to stated needs of national institutions. Incorporated into Phase II.
4. Long-term training abroad should continue under the proposed bridge financing. Incorporated into Phase II.

K. Administration

1. Officials responsible for project administration and administrative directors at the regional and central levels should receive training in Government of Guatemala and AID financial and administrative procedures. Incorporated into Phase II.
2. AID should establish a project bank account to facilitate fund disbursement. Incorporated into Phase II.
3. The follow-on project should contain a discretionary budget line such as that managed by the EAT. Incorporated into Phase II.
4. Equipment purchases should be made from national suppliers whenever possible, in order to expedite delivery and facilitate service. Incorporated into Phase II.
5. Computer installation in Region I offices of BANDESA, DIGESA, ICTA, and INDECA should be given priority, and a needs assessment of necessary hardware and software and training needs be undertaken. Incorporated into Phase II.

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UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

AGENCIA PARA EL DESARROLLO INTERNACIONAL (E.U.A.)



USAID/GUATEMALA

XD-ABA-760-A

Office of Rural Development
Report No. 29

SMALL FARMER DIVERSIFICATION SYSTEMS
PROJECT (520-0255) -- FINAL EVALUATION

October 30, 1987

SMALL FARMER DIVERSIFICATION SYSTEMS
PROJECT (520-0255) -- FINAL EVALUATION

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Under AID contract number PDC-1406-I-00-7012-00.

Date: 30 October 1987

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FAO Food and Agriculture Organization of the United Nations
 FSR/E farming systems research and extension, methodology used by ICTA
 GOG government of Guatemala
 GRF Global Revolving Fund, of the National Treasury, Ministry of Public Finance--makes fund advances
 ICAITI Instituto Centro Americano de Investigación y Tecnología Industrial (Central American Institute for Technological and Industrial Research)
 ICTA Instituto de Ciencia y Tecnología Agrícola (Institute of Agricultural Science and Technology)
 IDB Inter-American Development Bank
 IFPRI International Food Policy Research Institute
 IICA Interamerican Institute for Agricultural Cooperation
 INACOP Instituto Nacional de Cooperativismo (National Institute for Cooperatives)
 INAFOR Instituto Nacional Forestal (National Forestry Institute)
 INAP National Public Administration Institute
 INCAP Instituto de Nutrición de Centro América y Panamá (Central America and Panama Nutrition Institute)
 INDECA Instituto Nacional de Comercialización Agrícola (National Institute of Agricultural Marketing), mandated to assist with all agricultural marketing activities, but so far, deals mostly with stabilizing basic grain prices through a storage program
 INE Instituto Nacional de Estadística (National Statistics Institute), of Ministry of Economy)
 IRR internal rate of return
 MAGA Ministerio de Agricultura, Ganadería y Alimentación (Ministry of Agriculture, Livestock and Food)
 PACD project assistance completion date
 PP project paper

ProAg project agreement

 Proyecto para la Generación y Transferencia de
 Tecnología Agropecuaria y Producción de Semillas
 (Project for Generation and Transfer of Agricultural
 Technology and for Seed Multiplication), IDB

Q quetzales

UCPRODA Unidad de Coordinación para el Proyecto de
 Diversificación Agrícola (Coordination Unit for Project
 520-025E)

UNDP United Nations Development Programme

URPA Unidad Regional de Planificación Agrícola (Regional
 Agricultural Planning Unit), planned branch of USPADA
 in each region)

USAID AID mission in Guatemala

USDA U.S. Department of Agriculture

USPADA Unidad Sectoral de Planificación para la Alimentación y
 el Desarrollo Agrícola (Sector Planning Unit for Food
 and Agricultural Development), entity responsible for
 MAGA planning, evaluation and statistics

PREFACE

Associates in Rural Development, Inc. (ARD), was contracted by the U.S. Agency for International Development (AID) to undertake a final evaluation of the Small Farmer Diversification Systems Project (AID project number 520-0255). ARD's evaluation team--Drs. Itil Asmon (team leader and institution-building specialist), James Jones (farming systems analyst) and Michael Schwartz (development economist)--was in Guatemala from 6 September to 17 October 1987. They were assisted during the last month by Ing. Agr. Astolfo Fumagalli, a Guatemalan farming systems analyst. The evaluation team wishes to express its thanks to all the Guatemalan and USAID officials involved in this evaluation effort for their wholehearted support, particularly the regional heads of the institutions involved, Ing. Agr. Edgar Pineda (the current USAID project manager) and Dr. Gary Smith (chief of the technical assistance team).

I. EXECUTIVE SUMMARY

A. Project Description and History

The Small Farmer Diversification Systems Project (520-0255) is a joint effort of the government of Guatemala's (GOG) public agricultural sector and AID to assist small farmers in the Western Highlands of Guatemala through the promotion of nontraditional, improved agricultural and livestock technologies. The project's goal is to improve the well-being of rural Guatemalans living in the Western Highlands. The subgoal is to improve small-farm management and increase the return to factors of production of the small-farm enterprise. The purpose is to strengthen the capacity of the public agricultural sector to stimulate small-farm diversification from basic grains to other crops of higher value that require greater labor intensity.

To achieve these goals and purpose, the Project promotes five components--mini-irrigation (mini-riego), soil conservation, and vegetable, fruit and livestock production. In support of this effort, the Project provides applied research (technology adaptation), extension and technology transfer, non-reimbursable social payments for soil conservation, and credit for mini-irrigation systems, vegetable production, fruit plantations and livestock modules. The Project also conducts farmer surveys in its area of influence as well as training, monitoring and evaluation.

The project paper (PP) for the Small Farmer Diversification Systems Project was approved on 29 April 1981. The project agreement (ProAg) was signed in September 1981 for US\$5.5 million in loan funds (520-T-034) and US\$2.6 million in grant funds (520-0255) plus counterpart funds of US\$6.674 million, for a total budget of US\$14.774 million. Conditions precedent to the disbursement of AID funds were met in June 1982, and the first financing activities through BANDESA took place in August 1983. A U.S. Department of Agriculture (USDA) technical assistance team was contracted under a PASA signed on 26 July 1983. The ProAg was amended on 30 March 1985 to provide an additional US\$1.096 million grant for the technical assistance. The project assistance completion date (PACD), originally 31 March 1987, was extended to 31 December 1987. Thus, at the time of this final evaluation, the Project had been operating for approximately four years.

The Project has been implemented by the regional staffs of four organizations--the Instituto Centro Americano de Investigación y Tecnología Industrial (Institute of Agricultural Science and Technology, ICTA), Dirección General de Servicios Agrícola (General Directorate of Agricultural Services, DIGESA), Dirección General de Servicios Pecuarios (General Directorate of

Livestock Services, DIGESEPE) and Banco Nacional de Desarrollo Agrícola (National Agricultural Development Bank, BANDESA). They have been assisted by the Equipo de Asistencia Técnica (technical assistance team, EAT), composed of Guatemalan and U.S. technical advisors and supported by grant funds.

The project area (see Figure 1) consists of six departments in northwestern Guatemala--Quezaltenango, Sololá, Totonicapán, San Marcos, Huehuetenango and Quiché. This area has been designated Region I by the Ministerio de Agricultura, Ganadería y Alimentación (Ministry of Agriculture, Livestock and Food, MAGA). In a 1979 census, this region had a population of 1.8 million, most of it rural. There were 215,093 farms, of which 96 percent were less than seven hectares. Region I is mountainous, and its great variety of elevation and climate gives it a comparative advantage for deciduous fruit and vegetable production.

The original project area consisted of 14 municipios (the smallest Guatemalan administrative unit) of the total 110 in the six departments listed above. By mid-1983, when fieldwork began, the project area had been increased to 64 municipios without a corresponding increase in personnel and resources. By mid-1984, project authorities accepted EAT's advice and reduced the area of activity to 37 municipios forming 12 "diversification districts" (two in each department). These consisted of 12 lead municipios (chosen because they contained the local agencies of all four implementing organizations) and 25 peripheral municipios.

B. Evaluation Objectives

The PP called for a midterm evaluation (that report was published in September 1985) and final evaluation. The objectives of this final evaluation were to:

- compare the inputs (e.g., funds, equipment, technical assistance), outputs, purpose (institution-building), subgoal (production) and goal (income, employment and nutrition improvements) achieved with those envisioned in the PP and annual operating plans;
- identify any shortcomings in the original conception of the project and its implementation;
- determine project achievements;
- analyze lessons learned from this innovative project; and
- recommend appropriate follow-on activities.

C. Findings

1. Project Impact

All indications are that the Project has had a strong, positive impact on its beneficiaries. The 1986 sondeo (a rapid, informal survey of a selected area), with a sample of 100 farms, found a significant difference between beneficiaries and non-beneficiaries in terms of farm capital, production and income. Although deficient in many aspects, a larger 1987 survey of 1,142 farms also found that the incomes of project beneficiaries were higher than those of non-beneficiaries.

2. Output and Input Targets

? The Project achieved 35 percent of its original targets for mini-irrigation (farmer demand was much higher, but this credit item was rapidly exhausted), 114 percent for soil conservation, 35 percent for vegetable production, 120 percent for fruit plantations and 58 percent for livestock units, for an overall achievement rate of 60 percent. The Project also resulted in many other production increases (e.g., through a pruning campaign for existing orchards). In comparison, of the total budget of US\$9.196 million in AID funds, only about US\$7 million (76 percent) will be spent by 31 December 1987. Notwithstanding the design deficiencies and implementation problems discussed below, the Project has achieved a respectable internal rate of return (IRR) of at least 15 percent and created the basis for rapid progress in the future.

3. Institutional Achievements

As a result of the Project:

- the Comité Regional de Desarrollo Agrícola (Regional Committee for Agricultural Development, COREDA) in Region I is working as a team;
- ICTA has established vegetable, fruit and livestock research modules;
- DIGESA has strengthened its fruit and vegetable extension programs;
- DIGESEPE has become involved in animal production;
- BANDESA has devoted a large part of its resources to diversification credits and changed its operating rules so that most small farmers are eligible; and

- the Instituto Nacional de Comercialización Agrícola (National Institute of Agricultural Marketing, INDECA), although not officially a part of the Project, has become involved in vegetable marketing.

In sum, this was an institutionally ambitious project that aimed to coordinate the activities of four MAGA agencies to an extent never attempted before, and its progress in this respect is encouraging. It may be safely assumed that without the problems mentioned below (many of which could have been foreseen), the Project's achievements would have been much greater. The Project is succeeding in spite of these problems, because it responds to a felt need in the region and the opportunity for rapid progress exists. The Project is now entering a mature phase where the main problems are second-generation and concern marketing and credit recovery rather than production.

4. Design Deficiencies and Implementation Problems

The PP had several deficiencies that limited project performance, the most serious ones being:

- lack of a marketing component;
- priority on production targets when the institutional capacity necessary to achieve such production had not yet been created and research results were not yet available for extension;
- disregard of ICTA's institutionalized farming systems approach in what was supposed to be an institution-building project;
- unclear definition of EAT's role, which allowed it to become a separate institution;
- inappropriate "farm-models" approach; and
- overambitious farmer surveys of little operational value.

In terms of implementation problems, the Project had a slow start and suffered from frequent changes in MAGA's top leadership, competition among participating institutions, conflicts between project coordination and regional authorities, poor communications, and a lack of dynamic leadership from the initial USAID project manager and EAT leader. However, most of these problems have been resolved, and the project's rate of progress is clearly accelerating. It now enjoys the strong

support of MAGA leadership, regional authorities and beneficiaries.

D. Recommendations

AID should continue its involvement with agricultural diversification in the Guatemalan highlands. A PP team should design a follow-on project, this time in full collaboration with MAGA. Remaining project funds and additional financing should be used for bridge financing until the follow-on project begins.

The follow-on project should remain in Region I to capitalize on the institutional investment made there. During the bridge-financing period, project coverage should be limited to about 37 municipios, although some of these may be replaced by others.

The follow-on project should be a second-generation project (no longer a pilot project) and focus on the commercialization of smallholder agriculture. Consequently, it should focus on elements upstream and downstream of the actual production process--marketing of new products, improving credit recovery and production support through the testing/adaptation/validation of new technologies.

COREDA should remain the highest regional authority for the Project and be strengthened by the creation of a permanent secretariat, the Unidad Regional de Planificación Agrícola (Regional Agricultural Planning Unit, URPA), a regional branch of Unidad Sectoral de Planificación para la Alimentación y el Desarrollo Agrícola (Sector Planning Unit for Food and Agricultural Development, USPADA). Unidad de Coordinación para el Proyecto de Diversificación Agrícola (Coordination Unit for the Small Farmer Diversification Systems Project, UCPRODA) should be limited to project finance and administration.

Marketing should be recognized as the key element of diversification. A MAGA policy statement regarding the public sector's role in the marketing of perishable products and role of each institution is urgently needed. The Project should have its own marketing component. INDECA must become a participating agency and be recognized as the leading marketing institution. Appropriate functions for INDECA include disseminating market information, organizing producer groups for marketing, and grading and standards. It should not attempt to control the price of perishables. Long-term technical assistance on marketing should continue in Region I and be attached to INDECA. The Comité Regional Sectoral de Producción para la Exportación (Regional Sectoral Committee of Production for Export, CORSEPE) should act as a coordinating committee for marketing affairs, not an implementing agency.

Research should be based on ICTA's farming systems research and extension (FSR/E) approach. Technology validation and testing should receive adequate funds. The Project should follow the model of Proyecto para la Generación y Transferencia de Tecnología Agropecuaria y Producción de Semillas (Project for Generation and Transfer of Agricultural Technology and Seed Multiplication, PROGETTAPS) in establishing research/extension linkages. Extension should focus on vocational areas, specializing in different nonconventional crops, rather than trying to implement all the diversification techniques on each farm.

Large farm surveys should be avoided in favor of ICTA-supervised sondeos to orient project research. Assistance should be provided to the National Institute of Statistics or USPADA's Statistics Unit to strengthen the area frame surveys for estimating project impact.

BANDESA should be strengthened with logistic support and its efforts should emphasize loan recovery. The recommendations of the credit study with respect to the treatment of loan delinquency should be implemented. Credit should be made available as a function of demand. The loan process should be streamlined. Credit for contracting technical assistance should be allowed. New clients should be admitted only as BANDESA has the capacity to serve them.

Technical assistance personnel should be attached to designated MAGA institutions. COREDA should participate fully in formulating scopes of work and the selection of individual advisors. Expatriate technical assistance should be primarily short-term. The principal long-term assistance that is recommended is in the areas of marketing and integrated pest management. Future technical assistance requirements in fruit and livestock should be carefully defined.

Long-term training should continue. If the PROGETTAPS model of research/extension linkage is adopted, as recommended, short-term training should be aligned accordingly. A master plan for training is necessary.

Administrative training in MAGA and AID procedures should be provided for all MAGA administrators concerned with the Project.

Funding should be made more fluid by instituting "leapfrog" fund advances from the Global Revolving Fund, making more purchases locally, opening a project bank account to facilitate purchases using AID monies, and installing computers in the regional offices of the participating agencies to improve financial management, credit monitoring and the processing of agricultural production and marketing data.

A discretionary fund is invaluable for permitting agile responses in innovative projects and should be incorporated in the design of the follow-on project.

Project management by the implementing agencies and AID should be hands-on and dynamic, foreseeing and correcting problems before they begin to obstruct project activities.

II. PROJECT IMPACT

A. Improved Production Capacity

1. Overall Production Achievements

As an indicator of the success of the Small Farmer Diversification Systems Project in creating institutional capacity for agricultural diversification, project designers established specific ambitious goals to be reached in the field. Since that time, the Project has undergone many changes, and new estimations of expected impact have been made. Thus, a comparison of expected and achieved outputs may have lost much of its meaning as a measure of success, but such a comparison is easy to make and can serve as a point of departure for a brief discussion of project activities. Table 1 compares project targets with achievements, while Table 2 weights each activity by credit expenditures to determine an overall weighted percentage of achievement. This weighting permits an assessment of the relative importance of each activity in terms of dollars spent.

Table 1. Project Impact -- Projected Versus Achieved

<u>Activity</u>	<u>Unit</u>	<u>PP Target</u>	<u>Achieved</u>	<u>Achieved as % of PP</u>
mini-irrigation	farmers	5,000	1,741	35%
soil conservation	farmers	5,000	5,701	114%
mini-irrigation/ soil conservation	loans/social payments	10,000	7,441	74%
vegetables	hectares	1,500	525.7	35%
fruit trees planted	trees	50,000	60,000	120%
nontraditional crops	hectares	2,000	776.2	39%
livestock	modules	531	307	58%
livestock	animals	100,000	1,973,576*	1,974%
vegetable and livestock credit	loans	10,000	2,800	28%

*Cow/calf, 346 animals; sheep, 2,400; pigs, 176; chickens, 21,000; and bees, 1,950,000. Total of 1,973,576 animals.

Table 2. Weighting of Project Achievements

<u>Activity</u>	<u>% of PP Target</u>	<u>Weighting Factor*</u>	<u>Weighted % of Achievement</u>
mini-irrigation	35	.21	7.35%
soil conservation	114	.12	13.68%
vegetables	35	.37	12.95%
fruit-tree crops	120	.14	16.80%
livestock	58	.16	9.28%
Total			60.06%

*The weighting factor is based on the proportion of expenditures or credit for each activity compared to the total expenditures (credit) for all activities.

These tables show that percentage achievements of the PP production targets are 35 percent for mini-irrigation, 114 percent for soil conservation, 35 percent for vegetable production, 120 percent for fruit and 58 percent for livestock, for an overall weighted achievement of 60 percent of the PP targets.

In addition to the on-farm goals in the PP, surveys were conducted at different points over the life of the Project. The EAT's interpretation of the results of surveys conducted in 1986 and 1987 (the sondeo and farm survey, respectively) are that the Project was successful in substantially improving the production and nutrition situation for beneficiaries relative to typical farmers in the region. However, there is serious doubt about the reliability of these results as well as their manipulation and subsequent analysis. For reasons that are discussed in detail in Section III, the results of these surveys cannot be considered here as valid indicators of project performance.

2. Mini-Irrigation

The project's mini-irrigation component is one of the most popular and rational technologies to be introduced into the area. Its benefits are obvious and need not be reiterated. However, its most important effect has been to provide a production and organizational focus for crop diversification. The private sector (e.g., buyers for export), public sector (INDECA with

respect to farmers' markets) and others (the EAT marketing advisor) are looking to mini-irrigation projects as a basic unit of production and source of supply.

It appears that about 30 percent of the total usable area in mini-irrigation projects is currently being planted with nontraditional crops. The rest of the average minifundio, which measures approximately one-quarter hectare, is still planted in corn and beans, with small areas dedicated to livestock. It also seems that in some instances, problems with vegetable marketing have caused farmers to revert to their traditional staples.

Conclusion: For future programming of this activity, close attention must be paid to conflicting water demands among projects using the same water sources. Also, the increase in production potential realized through irrigation must be coordinated with the expansion of market opportunities.

3. Soil Conservation

Soil conservation efforts, principally the construction of terraces, have also been very well received. The number of farmers participating in this program component exceeded the goal from the PP. More importantly, however, it is estimated that 30 percent of the terraces are being constructed without social payments financed under Project T-034. Even when they are subsidized by T-034 payments, these cover only about one-third of the cost (if wage labor is used or family labor is shadow-priced).

In many instances, terracing is coupled with mini-irrigation, thus multiplying the benefits of each component. However, of concern to some technicians participating in the program is long-term terrace maintenance. The EAT irrigation advisor feels they are not being adequately maintained, whereas the DIGESA soil conservation chief believes the terraces do not show excessive deterioration to date. There have even been undocumented reports of farmers destroying their terraces to receive social payments for reconstructing them. In any case, the use and maintenance of terraces should be monitored by DIGESA, especially to identify conditions where they are most integrated into production. The upcoming evaluation of Project 520-T-037 should closely examine this situation.

Oddly enough, one of the conclusions drawn from the 1987 survey was that the soil conservation component did not improve yields or farm income. While there may be an outside chance that this is a valid observation, it is likely that the benefits of

the soil conservation effort are more accurately reflected by the enthusiasm of the farmers and extension agents.

Conclusion: Soil conservation practices should continue to be promoted, especially in association with mini-irrigation, where appropriate, and consideration should be given to other forms of conservation in areas that are not destined for crop production but would protect cropped areas from deterioration (e.g., vegetative barriers on upper slopes above cropped areas).

4. Vegetable Production

It is difficult to assess the project's net effect on vegetable production, especially new production. The principal vegetable financed through BANDESA under 520-T-034 is the potato, which accounts for about 30 to 40 percent of the vegetable production loans. The other traditional vegetable crops--carrots, beets, cabbage, and onions--comprise another 40 to 45 percent of the loans. From the standpoint of production experience, marketing acceptance and postharvest handling, these crops are logical choices.

In 1986, the last full year of observation, over 525 hectares (12,000 cuerdas) of vegetables were financed through BANDESA. Considering that most of the vegetable production is in mini-irrigation or traditional irrigation areas where three harvests per year are reasonable (except for certain crops, such as garlic), and assuming single-cycle lending where each harvest counts as a separate loan, each farmer financed by BANDESA would plant an average of about one-quarter hectare (six cuerdas) in vegetables. The expansion of vegetable production owes much to the tireless efforts of the DIGESA vegetable program director, his EAT advisor and the large quantities of quality seeds procured under EAT's discretionary budget line (see Section IV.J.5).

Expansion into export vegetable crops has been slow due to the unfamiliarity of farmers and ICTA/DIGESA technicians with those crops. The marketing of export crops also has higher risks and uncertainties for farmers, who are faced with requirements for higher quality, selected produce, a limited number of buyers, and lack of alternative (domestic) markets for export-broker rejects and/or during periods of low export prices.

Conclusion: The pace for adoption and expansion of traditional vegetable crops has been rapid and intuitively consistent with production knowledge and marketing opportunities. Continued growth depends

principally on the latter, as does the introduction of export-oriented vegetable crops.

5. Fruit-Tree Crops

DIGESA is selling over 30,000 apple and 10,000 peach seedlings per year. Nevertheless, the rate of new plantings under the project has not reached the credit levels anticipated, and less than 50 percent of funds allocated for fruit-tree loans were disbursed as of August 1987. A plausible explanation for part of this disparity is that essentially no new ideas, technologies or plant materials were forthcoming when the component began. Research on fruit-tree crops began with this program, and the full-time advisor started only about a year ago (although in 1985 and 1986 about 10 months of short-term assistance were provided during four visits).

The only performance indicator given in the PP is new plantings but, with EAT assistance, major emphasis is currently being placed on pruning as a technique that can increase earnings by over 10 percent with only marginal cost increases. Other management improvements (e.g., disease control and short-cycle crop associations) are also being promoted with the objective of increasing income, as opposed to merely planting trees. The direction being taken with respect to fruit-tree crops (principally apples and peaches) is to improve production on existing trees, while research and trials are being undertaken to identify promising new varieties.

Conclusion: Guatemala is the sixth or seventh largest producer of deciduous fruit in the western hemisphere, with good potential to increase its export share to Central America and the Caribbean. In those markets, where standards are less demanding, increasing quality and output through good management and postharvest handling would make Guatemalan products (especially apples) competitive.

6. Livestock Production

The livestock component of the diversification scheme has taken the longest time to realize results. The PP goal of establishing 531 animal modules was subsequently reduced to 245 in 1985--to date, 307 modules have been financed by BANDESA. Partly, the problem has been in conceptualizing the role that a livestock module should play on a diversified farm, but also difficulties have been due to the weakness of the animal production program in the public sector when the Project began. However, during the past two years, the direction of the livestock activity has become better defined.

At present, emphasis is being placed on enhancing the livestock unit and its complementarity with crop production. Both the cow/calf and sheep modules have undergone serious rethinking and reorientation. The result has been that a prerequisite for the cow unit will be enough pasture to support most feed requirements. Both DIGESEPE and BANDESA are in agreement that more rigorous criteria and screening must be applied to the selection of candidates for the cow/calf module. The principal problems with this activity have been the lack of quality cows at reasonable prices, low nutritional feeding level on farms lacking sufficient land for pasture, and high costs for farmers who must purchase feed to follow feeding recommendations.

The development of the sheep module reflects a significant change from the initial conception. The current model is based on a sheep-fattening plan where pasture is planted and cut during the rainy season to feed animals that are bought and fattened during the dry season. The module is now a short-term (nine-month), high-return activity that is a sensible, profitable management scheme in the Guatemalan context.

Paradoxically, through DIGESEPE, the livestock activity has the best record-keeping of any project element, but the worst record for loan repayment. Improved selection of beneficiaries, revised technical and management recommendations, and better monitoring of participating farmers are necessary to improve this performance. In October 1987 (possibly due to the evaluation team's visit), DIGESEPE initiated, with EAT assistance, a series of measures to reduce credit delinquencies.

Conclusion: Reorientation of the livestock component has stressed the viability of recommended modules and recognized that the activity must be justifiable in its own right. Adjustments must still be made regarding the most effective scale and technology level to be recommended, but as commercial criteria gain precedence, quality and profitability will increase. The decision to concentrate principally on cows, sheep, pigs and chickens is consistent with their economic potential and local cultural preference.

B. Improved Standard of Living

1. Income

The PP projections and actual reported impact on income due to production activities are summarized in Table 3. The differences reflect both the realities of implementation and optimistic expectations of the project's designers.

Table 3. Project Objectives and Achievements

<u>Indicator</u>	<u>Unit</u>	<u>PP Target</u>	<u>Achieved</u>
production value increase	US\$	5,500,000	900,000
employment increase	person-years	1,782	1,107
vegetables	hectares	1,500	525.7
fruit-tree crops:			
new	hectares	150	252
rehabilitation	hectares	n/a	80
animal production	modules	541	307

The value of production increases that will be generated between 1983 and 1993 as a result of activities initiated under T-034 is expected to fall short of PF projections due to the reduced area in vegetable crops, unreasonably high earnings predicted for some activities and slow start-up of the Project. Table 4 shows revised costs, sales and income based on the production levels realized by the end of 1987.

In calculating the values in Table 4, certain assumptions were made, some of which bias the results, but are consistent with the information available. These principal assumptions are discussed briefly below.

First, the costs and returns for vegetable crops are sufficiently similar to permit them to be treated in the aggregate. Since over 85 percent of credit assistance is given for traditional vegetable crops (potatoes, carrots, onions, beets and cabbage), the composite value for a "vegetable crop" was calculated using the production costs and sales value for each crop, weighted by the corresponding area planted. This approximation was necessary since the data for vegetable credits are not broken down by specific crop. The direction of the bias is unknown.

Second, the income measure is the net increase over previous crops grown. It is assumed that all the land was in basic grains previous to the Project, but there is no information to confirm this. BANDESA and DIGESA extensionists claim this was the prevailing situation, but a percentage of beneficiaries were traditionally producing vegetables (especially potatoes) before T-034. The direction of this bias is to overstate the net income increase.

Table 4. Summary of Project Benefits and Costs

Project Year		1	2	3	4	5	6	7	8	9	10
VEGETABLES											
Cost	Q	12,870	313,170	2,271,360	4,715,490	3,900,000	4,690,000	4,680,000	4,680,000	4,680,000	4,680,000
Sales	Q	19,272	468,952	3,401,216	7,061,144	5,840,000	7,008,000	7,008,000	7,008,000	7,008,000	7,008,000
Net Income	Q	6,402	155,782	1,129,856	2,345,654	1,940,000	2,328,000	2,328,000	2,328,000	2,328,000	2,328,000
LIVESTOCK											
Cost	Q	0	161,463	361,608	712,980	957,841	957,841	957,841	957,841	957,841	957,841
Sales	Q	0	190,643	438,850	869,042	1,178,863	1,178,863	1,178,863	1,178,863	1,178,863	1,178,863
Net Income	Q	0	29,144	77,134	155,774	220,518	220,518	220,518	220,518	220,518	220,518
FRUIT CROPS											
-PEACH (new)											
Cost	Q	0	67,280	107,009	120,002	107,483	98,653	115,194	126,978	132,866	132,866
Sales	Q	0	0	0	0	39,360	144,300	256,050	332,340	358,980	358,980
Net Income	Q	0	(67,280)	(107,009)	(120,002)	(68,123)	45,647	140,856	205,362	266,114	266,114
-APPLE (new)											
Cost	Q	0	161,750	259,155	314,296	304,517	291,840	323,584	353,062	374,864	417,504
Sales	Q	0	0	0	0	0	120,400	307,704	523,684	674,022	737,220
Net Income	Q	0	(161,750)	(259,155)	(314,296)	(304,517)	(171,440)	(15,844)	170,622	299,158	319,716
-APPLE (rehab.)											
Net Increase	Q	0	0	0	13,600	27,200	27,200	27,200	27,200	27,200	27,200
INVESTMENT											
Loan	Q	166,000	942,000	425,000	650,000	2,350,000					
Grant	Q	0	795,000	844,000	1,141,000	2,893,000					
GOG	Q	283,000	584,000	727,000	844,000	2,036,000	1,180,000	880,000	880,000	880,000	880,000
TOTALS											
Benefits	Q	19,272	659,595	3,840,066	7,943,786	7,085,423	8,478,763	8,777,817	9,070,087	9,247,065	9,310,263
Costs	Q	461,870	3,024,663	4,995,132	8,497,768	12,548,841	7,208,334	6,956,619	6,997,881	7,025,571	7,068,211
Net Benefits	Q	(442,598)	(2,365,068)	(1,155,066)	(553,982)	(5,463,418)	1,270,429	1,821,198	2,072,206	2,221,494	2,242,052
IRR		-0.81%	(10 years)	11.4%	(15 years)	14.5%	(20 years)	15.6%	(25 years)		

Third, the costs and returns for fruit-tree crops are aggregated and weighted by the relative importance of production areas. One composite value is used to calculate costs and returns for apple production and one for peach production. The direction of the bias is unknown.

Fourth, it is assumed that the delinquency/default rate on the BANDESA T-034 portfolio will continue to be 10 percent, although maintaining this rate will require increased attention to loan recovery. The probable direction of this bias is to understate investment costs, but loans that are not repaid may be regarded as income transferred to farmers.

Fifth, the costs, income and employment for agricultural production were obtained from BANDESA calculations. The consensus of DIGESA and DIGESEPE is that they are representative of actual values at the farm level. However, calculations by the EAT marketing advisor yielded higher production costs, but were based on only a few mini-irrigation groups. The direction of bias is to possibly understate costs.

Sixth, two cycles of vegetables per year are assumed. Where irrigation is available, three is a more likely number. The direction of this bias is to understate benefits.

Seventh, the area under vegetables (by far, the project's largest income-earner) was taken as only the area financed by BANDESA credit. There is evidence that farmers benefited from DIGESA promotion and EAT-supplied seeds to plant more vegetables without BANDESA credits. The direction of this bias is to understate benefits considerably.

The recalculation of project benefits and costs reveals a considerably more modest and plausible picture of short-run returns for costs and investments under T-034. The first five years of project inputs are divided nearly equally between institutional investment (48 percent) and production costs (52 percent). The heavier weighting given to values for earlier years in the discounting process counts this institutional investment more heavily than the future positive benefits stream, although it has no direct output in the farm sector.

Investment in institution-building passes through different phases before it can be expected to affect the production process. Roughly, the focus on diversification entailed a change in the mentality of participating institutions, orientation of technician preparation and activity programming, and message and assistance given to farmers.

The PP projected an IRR of 65 percent at the end of 10 years. The ARD evaluation team feels that 20 to 25 years is a more realistic period since it corresponds to the useful life of

the main project investments (mini-irrigation systems and fruit plantations). Table 4 shows that over the project's life, the projected IRR based on actual achievements is about 15 percent. Considering the assumptions detailed above, especially the non-imputation of vegetable areas planted without BANDESA credits, this figure probably understates the real IRR. For a project with considerable long-term institutional investments and more than its share of design defects and start-up difficulties, this is a respectable achievement.

2. Employment

Table 5 shows that the Project generated about 1,107 person-years of new employment, 62 percent of the target of 1,782 person-years in the PP.. Mainly, this result reflects the PP's considerable understatement of the labor requirements for vegetable production and, to a lesser extent, fruit-tree crops. Using more realistic labor estimates, it can be seen that the Project achieved 62 percent of its employment-generation objective in only 35 percent of the planned vegetable area.

A study done on the Cuatro Pinos cooperative by the International Food Policy Research Institute (IFPRI, NONTRADITIONAL EXPORT CROPS IN TRADITIONAL SMALLHOLDER AGRICULTURE: EFFECTS AND PRODUCTION, CONSUMPTION AND NUTRITION IN GUATEMALA, 1987) has also shown that entry into vegetable production from basic grains results in a six- to eight-fold increase in family labor inputs and 250 percent increase in the amount of hired labor used. The year-round nature of both vegetable and livestock production, in combination with the higher incomes derived, reduce the time spent on off-farm wage-earning activities. The IFPRI survey found that only 16.5 percent of vegetable cooperative members sought agricultural day-labor jobs, compared to 30 percent for nonmembers. Similarly, 30 percent of co-op members received income from nonagricultural wages, compared to 40 percent for nonmembers. Likewise, in the livestock modules of the T-034 Project, it was shown that all of the participants who previously migrated to the coast as agricultural day laborers stopped doing so. The additional income provided by diversification activities is sufficient to obviate the need for this traditional migration.

3. Nutrition

Theory and the PP predict that an increase in net income and the availability of food for on-farm consumption improve levels of nutrition. In the 1983 baseline survey, standard nutrition indicators were measured for traditional and nontraditional farms, and revealed little difference in the nutrition levels

Table 5. Employment Generation*

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Project Year	1	2	3	4	5	6	7	8	9	10
VEGETABLES	2	59	427	887	733	880	880	880	880	880
LIVESTOCK	0	14	32	59	74	74	74	74	74	74
FRUIT CROPS	0	24	56	86	106	115	126	139	148	153
TOTAL	2	97	515	1032	913	1069	1079	1093	1101	1107

*In person-years.

among children under five years of age. Table 6 summarizes these income and nutrition levels.

Table 6. Nutrition Results of the 1983 Baseline Survey

<u>Measurement</u>	<u>Traditional*</u>	<u>Nontraditional</u>
total income:**	Q770	Q1,457
cash income	Q473	Q 550
noncash income	Q297	Q 907
nutritional level:***		
long-term--height/age	.85-.89	.90-.99
short-term--weight/height	.90-.99	.90-.99

*Farms with over 70 percent of their cultivated area in corn, beans, wheat and/or potatoes.

**Figures given are in quetzales (Q).

***Index value where 1.00 is the standard--any values under .80 and .90 of the standards for weight/height and height/age, respectively, are considered to indicate a nutritional deficiency.

A second survey was undertaken in 1987 to measure changes during the four-year period since the baseline survey. The results of this survey will be analyzed by the Instituto de Nutrición de Centro América y Panamá (Central America and Panama Nutrition Institute, INCAP) and were not available at the time of this evaluation. The sondeo done by EAT does not include any nutrition measurements, and its on-farm consumption data are insufficient to provide information regarding the relative well-being of traditional and nontraditional farm families.

The IFPRI study, conducted and analyzed in May 1987, focused on the Cuatro Pinos cooperative and did not include observations from the T-034 project area, but some of its findings concerning nutrition are presented here because of the similarity between that study and the information and results being sought in the 1987 T-034 survey.

The IFPRI study compared height and weight as indicators of nutritional levels for children under five of cooperative (Cuatro Pinos) members and nonmembers. The results showed only slightly more improvement or less deterioration for co-op members from

1983 to 1985 compared to nonmembers. Weight measurements (a short-term indicator) showed a greater advantage for co-op members than height (long-term indicator). It was felt that the general economic crisis in the early 1980s (a decrease in the per capita gross domestic product by 20 percent between 1981 and 1985) resulted in worsening health conditions across the board, but relatively less so in the families of co-op members. According to the report, when the analysis was stratified by income levels between and within the two groups, "a generally positive but weak relationship between income and improvement in nutritional status" was indicated.

III. ACHIEVEMENT OF PROJECT IMPLEMENTATION GOALS

A. Overall Disbursements

1. Loan and Counterpart Funds

By December 1987, about 90 percent of the funds for the Small Farmer Diversification Systems Project (loan, grant and GOG counterpart) will have been disbursed, not including the approximately US\$1.7 million that remains in the credit funds line item as a result of changes in the dollar-quetzal exchange rate. Table 7 indicates yearly loan and counterpart expenditures by activity as well as estimated balances remaining at the end of the year. The two activities that show large balances are the credit fund and construction budget line. The former, totaling Q413,000, will probably not be spent (in spite of claims to the contrary), if this year's lending rate is maintained. Part of the Q417,000 construction balance will remain through the end of the year. Plans have been completed for DIGESA's construction, totaling Q257,000, and materials are being purchased. All other construction, except for DIGESEPE's laboratory, will be completed next year using project funds--DIGESEPE's money will not be used.

The primary problems causing construction delays lie entirely with the GOG. Superficially, blame can be placed on the government's failure to include the construction in any of its annual operational plans, but a fair amount of interinstitutional rivalry seems to be a more fundamental cause. While the overall disbursement represents a reasonably high percentage of total loan and counterpart funds, yearly disbursements were not at all close to PP projections. The bulk of actual spending will have occurred during the Project's last two years (66 percent of loan and counterpart funds), whereas the design called for 74 percent to be spent in the first three years. The Project's slow start (only four percent of total disbursements were made in the first year), very late procurement (93 percent of all procurement was carried out in 1987, mostly for items requested in 1983) and lack of construction activity threw the project calendar off schedule. Expenditures for construction and the procurement of corresponding equipment were to have been completed by mid-1983. Poor management and AID project manager's unfamiliarity with agency procedures, as well as lengthy delays on the part of the procurement company contracted, were the principal reasons for delayed procurement.

Table 8 shows principal expenditures by institution. The trend observed is that a concentration of AID loan funds was expended during the Project's final two years. This is also due to the bunching of procurement and construction expenditures in 1987. GOG funds display a more even disbursement, which is

Table 7. 520-T-034 Expenditures by Principal Activity (Q1,000)

Activity		1983	1984	1985	1986	Jan-Aug 1987	Sept-Dec 1987	Total	Budget	Not Disbursed	Disburse- ment (%)
Personal services	AID	--	7	9	16	13	350	395	432	37	91
	GOG	138	505	510	661	555	846	3235	3235	--	100
Non-personal services	AID	--	5	9	9	8	--	31	73	42	42
	GOG	32	77	79	103	36	111	438	438	--	100
Materials and supplies	AID	45	157	196	303	363	188	1252	1252	--	100
	GOG	--	2	--	--	--	49	51	51	--	100
Vehicles and equipment	AID	10	433	11	207	104	900	1665	1665	--	100
	GOG	--	--	--	--	--	--	--	--	--	--
Construction	AID	--	61	2	90	--	--	153	570	417	27
	GOG	--	--	--	--	--	--	--	--	--	--
Credit fund	AID	110	689	383	827	560	300	2869	3000	210	96
	GOG	112	--	563	590	595	300	2160	2177	203	99
Subtotal	AID	165	1352	610	1452	1048	1738	6365	6992	627	91
	GOG	282	584	1152	1374	1186	1306	5884	5901	17	99
Total		447	1936	1762	2826	2234	3094	12249	12893	644	95
	% Total	4	16	14	23	18	25	100			
	% AID	3	22	9	23	17	26	100			
	(Project Paper %)	(28)	(23)	(23)	(12)		(14)	(100)			
	% GOG	5	10	20	23	21	21	100			

Table 8. 520-0255 Principal Expenditures by Institution (in Q1,000)*

Institution		1983	1984	1985	1986	(Jan-July) 1987	Est. (Aug-Dec) 1987	Total	Budget	Unspent	% Spent
BANDESA Credit	AID	111	689	383	827	479	380	2869	3000		96
	GOG	112	--	563	590	432	463	2160	2177		99
BANDESA Support	AID	--	52	--	--	22	177	251	124		202
	GOG	--	--	--	118	--	--	118	111		106
DIGESA	AID	27	167	65	74	150	504	987	1245	258	79
	GOG	67	213	221	268	210	695	1674	1674	--	100
DIGESEPE	AID	--	138	53	116	142	339	788	928	140	85
	GOG	1	81	87	88	109	167	533	533	--	100
ICTA	AID	27	212	67	383	80	648	1417	1439	22	98
	GOG	103	290	280	323	205	169	1370	1370	--	100
Coordination (\$)								[255]	[255]	[--]	[100]
Technical loan assistance (\$)		--	89	32	47	45	38	252 [3067]	252 [3067]	-- [--]	100 [100]
Surveys (\$)								[226]	[286]	[--]	[100]
Total (034)								12419			
Percent:											
BANDESA (credit)		4	14	19	28	18	17	100			
DIGESA (AID)		3	17	7	7	15	51	100			
DIGESEPE (AID)		--	18	7	15	18	42	100			
ICTA (AID)		2	15	5	27	6	45	100			

*Grant in US\$1,000 in [].

generally due to the high proportion of salaries. Elevated figures for GOG funds at the end of 1987 reflect final salary payments, benefits and severance pay reserves. Credit-fund expenditures show an expected yearly increase over the life of the Project. The 1984 figures for the research and extension agencies reflect vehicle purchases.

2. Grant Funds

Nearly all grant funds will be disbursed by the end of 1987. Table 9 indicates the situation at the end of September. The only activities that might possibly have appreciable balances by the end of 1987 will be 4-S and technical assistance support, the latter depending on costs associated with the logistics of disbanding EAT. The surveys were completed, and nutrition analysis is still being done. The 4-S money transfer has been negotiated and awaits administrative approval.

Table 9. Grant Fund Utilization

<u>Activity</u>	<u>Budget</u>	<u>Amount Spent</u>	<u>% Spent</u>
surveys	245	198	81%
coordination	255	233	91%
4-S	82	-	0%
technical assistance:			
PASA	2,044	1,802	88%
Guatemalan	520	351	68%
support	503	176	35%

B. Institutional Indicators (Outputs)

Perhaps the most significant and difficult aspect of the Project was effecting a change in the attitude and orientation of participating institutions to the point where the concept of diversification became incorporated into their philosophy and operational plans. The PP proposed to measure the Project's success in effecting this change through its impact on production--hence, the use of on-farm outputs as purpose-level indicators. One thread that runs throughout this evaluation is the doubt that on-farm impact is an adequate measure of institutional change, especially in the short-run. In fact, in the case of this project, the stress on production targets was clearly obtained at the expense of institution-building (e.g.,

training). It would be worthwhile to look at intra-institutional indicators to gather further evidence on how each group has responded to the project's efforts to institutionalize diversification.

1. BANDESA

BANDESA loan activity is basically reactive, and its orientation determined essentially by the activities of the extension institutions (DIGESA and DIGESEPE) and the ground rules laid out in the trust fund agreement. Table 10 demonstrates the relationship of T-034 activity to BANDESA's total portfolio.

Table 10. BANDESA Portfolio in Region I

Year	Number of Loans			Amount of Loans (Q1,000)		
	Total	T-034	%	Total	T-034	%
1983	5,415	20	1%	6,102	88	1%
1984	10,121	357	4%	14,704	847	6%
1985	7,121	677	10%	8,235	1,160	14%
1986	8,785	977	11%	12,399	1,883	15%
1987*	7,500	609	8%	11,481	1,182	10%

*Through 31 August 1987.

In addition to the information in the preceding table, it should be recognized that repayments of T-034 loans over the years are loaned again as BANDESA funds, thus forming part of the total values. This relending of project funds takes on added importance given the reforms in BANDESA policy to place greater emphasis on and access for small, diversifying farmers of the type served by AID (see Section IV.E for a more detailed discussion of these reforms). Future analysis of BANDESA funds will reveal the extent to which the priority on diversification has been institutionalized. In qualitative terms, administrators and credit agents indicate that a more intense effort is being placed on diversification credit activity. This is evidenced in the relationship between credit and extension agents, where the former are introducing increased rigor to the evaluation and selection of project beneficiaries.

2. DIGESA

Institutional change within DIGESA is very difficult to measure due to the overlap of extension priorities and generalist approach of extension agents. Likewise, a review of this institution's annual reports is not very helpful due to inconsistencies in format and the information presented from one year to the next. In the end, the measures used in the PP may be the most realistic.

Using those indicators, DIGESA claims to have worked with over 10,000 farmers on the four activities that fall under its mandate--mini-irrigation, soil conservation, vegetable production and fruit-tree crops. Certainly, there is considerable double counting where the same farmers are beneficiaries of two or more project components. However, one outgrowth of AID diversification efforts (Projects T-026, T-034 and T-037) has been the focus of extensionists and local farmer guías on mini-irrigation projects as a setting for technology transfer. Also, the nearly complete use of credit funds programmed for each activity is an indicator that, at the very least, DIGESA has fulfilled its responsibilities under the Project.

Again, if qualitative indicators are used to assess DIGESA's commitment to diversification, the incorporation of component-specific offices in its organizational structure can be considered. As with BANDESA, confirmation of the institutionalization of diversification will be the future use of national budget funds to maintain these offices.

3. DIGESEPE

While DIGESEPE has been around since the mid-1970s, it is clear that T-034 revitalized it, giving it a new direction and change of focus from preventive veterinary medicine to livestock production and then livestock management. In global terms, the changing distribution of DIGESEPE's budget was used to measure the increasing importance placed on livestock production. Table 11 shows the allocation of the national and T-034 budget components. The distribution among the classes of expenditures has remained proportionately constant. However, with the injection of T-034 money, the absolute level of activity has shifted tremendously in favor of livestock production (since 1983, an increase of Q622,000 in animal production versus Q198,000 in preventive medicine). All of this change has been a result of T-034 inputs--the distribution and amount of the national budget component has remained essentially constant.

Table 11. DIGESEPE Budget (Q1,000)

<u>Classification</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Administration (%)	7%	6%	7%	7%	7%
national	21	21	21	21	21
T-034	-	9	19	31	62
total	21	30	40	52	83
Animal health (%)	26%	23%	23%	23%	23%
national	82	75	71	71	71
T-034	-	33	63	105	209
total	82	108	134	176	280
Livestock production	68%	70%	70%	70%	70%
national	216	228	213	213	213
T-034	-	99	189	315	626
total	216	327	402	528	838
Grand total	319	466	576	755	1,201

As a further measure of DIGESEPE's orientation toward diversification, particularly the farm livestock component as a commercial activity, Table 12 presents information on the changing composition of training courses for DIGESEPE technicians. It can be seen that management courses have become a significant element of DIGESEPE's training program for its extension agents and further assumed that this orientation will have a multiplier effect through their contacts in the field.

Table 12. DIGESEPE Training Courses

<u>Course Orientation</u>	<u>1983</u>		<u>1984</u>		<u>1985</u>		<u>1986</u>		<u>1987</u>	
	<u>No.</u>	<u>%</u>								
animal health	15	43	12	41	13	33	16	36	14	39
animal production	15	43	13	45	16	41	17	39	13	36
animal management	5	14	4	14	10	26	11	25	9	25

4. ICTA

By their very nature, commitments in the area of research are long-term. For all three principal production elements (vegetables, fruit and livestock), ICTA began its research experience with T-034 inputs. During the Project's life, it has

built and continues to develop infrastructure to support investigation in these three new specialties and has trained staff to carry out its future research. To date, 14 professionals have been added to ICTA's research staff, with a corresponding increase in support staff. In addition, ICTA was the only institution to invest project money in long-term training. Two master's level candidates were financed using T-034 funds and a third with non-project money. In 1988, two vegetable-crops specialists and one in fruit-tree crops will return to the ICTA staff.

C. Technical Assistance Inputs

The long-term technical assistance that the Project received differed greatly from what was proposed in the original PP and significantly modified by a PP amendment in 1985. Table 13 shows the initial and amended technical assistance proposals as well as the team that actually served under the Project. It can be seen that the total long-term technical assistance effort increased from 20 person-years in the PP, distributed among eight specialists, to 34.5 person-years for a U.S./Guatemalan team of 15 specialists covering nine disciplines. The team that will have worked on the Project represents 35.25 person-years divided among U.S. (15.5 person-years) and Guatemalan (19.75 person-years) specialists, also in nine disciplines.

In addition to a 75 percent increase in the technical assistance effort (as measured in person-years), two important changes were made in the composition of the team:

- the placing of a marketing advisor; and
- formation of a Guatemalan technical assistance team.

D. Surveys

The PP relied heavily on surveys to guide the implementation process--two farm surveys, a nutrition survey and a credit study were to provide baseline data, lending-policy indicators and a basis for impact measurement. In addition, EAT and the national services designed, executed and analyzed a farm sondeo as a precursor to the final farm survey. All five surveys or studies have been completed, and the results of the first farm survey, credit study and sondeo are available. Preliminary results from the 1987 farm survey designed to measure project impact are in, and the nutrition survey is being completed and will be analyzed by INCAP. Of the three studies completed, only the credit survey was adequate for its intended purpose.

Table 13. Long-Term Technical Assistance: Specialties and Duration (in person-years)

<u>Project Paper</u>	<u>P/Y</u>	<u>Amendment</u>	<u>P/Y</u>	<u>T.A. (as implemented)</u>	<u>From</u>	<u>To</u>	<u>P/Y</u>
		<u>U.S.</u>		<u>U.S.</u>			
Research		Team leader - Adm.	2.5	Team leader - Adm.	11/83	12/87	4.0
Vegetables	3.0	Vegetable - research & extension	2.0	Vegetable crops	06/84	12/87	3.5
Fruits	3.0	Marketing	2.0	Marketing	09/86	12/87	1.25
Livestock	3.0	Fruit - research & extension	2.0	Fruit crops	09/86	12/87	1.25
Agricultural Economist	1.0	Livestock - research & extension	2.0	Livestock	06/84	12/87	3.5
Sociologist	1.0		2.0				
Extension		Farm mgmt./production systems	2.0	Farming systems	05/84	05/86	2.0
Soils and Irrigation	3.0	Irrigation	2.0	Sub-total			15.5
Livestock	3.0	Sub-total	14.5				
Crop Production	3.0	<u>Guatemalan</u>		<u>Guatemalan</u>			
		Ag. Economist	3.0	Analyst (Economist)	03/84	03/87	3.0
		Vegetable crops	3.0	Vegetable crops	10/86	12/87	1.25
		Fruit crops	3.0	Fruit crops	03/84	12/87	3.75
		Livestock	3.0	Livestock	03/84	12/87	3.25
		Farm mgmt./production systems	2.5	Anthropologist	07/83	07/87	4.0
		Sociologist/Anthropologist	2.0	Marketing	06/84	12/87	2.5
		Marketing	2.0	Irrigation	01/86	12/87	2.0
		Irrigation	2.0				
		Subtotal	20.0	Subtotal			19.75
Total	20.0	Total	34.5	Total			32.25

The results of the 1983 baseline farm survey, which were to guide the design of project activities, only became available in January 1986. In fact, the information contained in this survey does provide a very general picture of Region I and, in quality, resembles a sondeo rather than a full-fledged survey (726 farms in 64 municipios were sampled). The idea was to include sample farms from this first survey in the 1987 study as well to permit specific comparisons and inferences at a regional level. Whether or not this can and will be done (and the information yielded by any such comparison is of value) awaits the full results of the 1987 survey. (Another farm survey done in 1985 on 1,100 farms was a complete failure, as the results could not even be processed.)

The credit study provides a detailed description of the workings of BANDESA. Of particular interest to project administrators is the discussion of the bank's handling of loan delinquency and default computation. However, it is not obvious that the revelations made in the study were taken into consideration in monitoring BANDESA's lending operations. For any amendment or continuation of the Project involving BANDESA and another trust fund, it is highly recommended that the practical parts of the credit study be examined closely.

The sondeo in late 1986 was done mostly by the USPADA Statistics Unit, DIGESA field agents and EAT anthropologist. The total sample size was 100, unevenly divided among five categories of producers. As is true of a typical sondeo, the results are not statistically valid. The two major drawbacks of using simple numerical averages to depict each farm group in terms of the different variables examined are:

- groups are often characterized by only one or two observations; and
- there is no statistical indication of the numerical range of observations represented by the average value.

Perhaps the most serious criticism of the sondeo is not of the data per se, but rather the analysis. Little attempt was made to order the information or organize it in a manner that would permit conclusions to be drawn. There is a certain quantity of information in the sondeo, but its presentation does not do it justice.

The 1987 farm survey was an ambitious attempt--the sample size was 2,500 farms, although only 1,142 gave usable results--to provide a measure of project impact. The data from this survey are still being "cleaned" and the results manipulated to overcome innumerable problems with data collection and specification. Three updates of preliminary findings have reached Guatemala from

USDA and have been subjected to analysis by EAT. In the brief data analysis accompanying the first set of results and in subsequent data manipulation by EAT, it appears that, to date, the survey results are essentially worthless.

It was argued in the latest EAT interpretation of survey results that they indicate the Project has had a positive impact. This conclusion is not self-evident, and doubts cast by sample selection, survey operation and data management seriously question the reliability of any forthcoming results. Without making a discussion of the 1987 farm survey a major section in this evaluation report, it does merit some attention. In the interest of brevity, the following discussion will not attempt to be balanced, but rather critical, in nature and should be taken as a caution in using the survey's results. The sample included five types of farms, the definition of which is not entirely clear:

- type 1--agricultural selected beneficiary farms, which received both technical assistance and credit under T-034 for crop production;
- type 2--livestock selected beneficiary farms, which received technical assistance and credit for animal production from T-034;
- type 3--nonselected beneficiary farms, which were randomly drawn, "located in the vicinity" of types 1 and 2, and may have received technical assistance and/or credit under the Project (definition by EAT's Mr. Smith taken from analysis of data for incomes, 9 October 1987);
- type 4--non-beneficiary farms without livestock, no technical assistance or credit from the Project; and
- type 5--non-beneficiary farms with livestock, no technical assistance or credit from the Project.

The last two types were randomly drawn from the same 12 municipios comprising the principal project area and presumably do not fall into the first three categories. However, if type 3 may not have received technical assistance or credit, it is not clear how to differentiate between Type 3 and Types 4 and 5. The sample size for each type was 224 for Type 1, 100 for Type 2, 414 for Type 3, 42 for Type 4 and 362 for Type 5, for a total sample size of 1,142.

The USDA analyst indicated several "considerations" regarding the data collection, including:

- unskilled enumerators, who were all government employees attending to their regular jobs while attempting to gather data;
- the questionnaire was in Spanish only, not in dialect;
- the excessive detail of the questionnaire made it "nearly impossible" to collect accurate information for certain sections, causing a "loss" of 35 percent of the income/cost data;
- the size of the area in production was not always known; and
- the cost of purchasing animals was not included in production costs.

From the results that have been compiled and distributed by EAT, several observations can be made. First, farm income was not controlled by size of farm, nor for level of income before the Project for Types 1, 2 and 3. (Both of these problems are mentioned in the EAT discussion, but only to say that they exist.) Juxtaposing the information from the 1986 sondeo with respect to farm size, a closer examination can be made of the 1987 survey results. Assuming that the categories of type 1 through 5 farms are comparable (and they appear to have been defined by very similar criteria), EAT's assumption that the randomness of the 1987 survey would guarantee roughly similar farm sizes across types is false. Adjusting for farm size, Table 14 shows the results.

Table 14. Farm Income -- 1987 Survey

<u>Farm Type</u>	<u>Total Farm Income (1987 survey in Q)</u>	<u>Sondeo Farm Size</u>		<u>Farm Income per Manzana (in Q)</u>
		<u>Manzanas*</u>	<u>Index**</u>	
1	825	5.39	3.19	153.06
2	1,301	10.98	6.50	118.49
3	1,608	5.00	2.96	321.60
4	346	1.92	1.14	180.21
5	309	1.69	1.00	182.84

*A manzana is 0.7 hectares (from Table 153 of the sondeo).

**Index = $\frac{\text{farm size of type T (T = 1,2,3,4,5)}}{\text{farm size of type 5}}$

The comparison of income per manzana among the five types no longer gives a very clear picture of the relative advantages of being a beneficiary farm. If the size of sondeo farms corresponds roughly to the size of survey farms of the same type, the data indicates that beneficiary farms were, on the average, three to 6.5 times larger than non-beneficiary farms, but the income per unit area was lowest for technical assistance beneficiaries, although this should presumably increase with diversification.

Second, the exclusion of livestock purchase costs greatly biases the results in favor of Type 2 (which derives 80 percent of its farm income from livestock activities, according to the survey) in that project participants buy better quality, more expensive stock. For example, indications are that the higher quality cows being bought by participants now cost about Q2,000 to 3,000, whereas criollo animals (local mixed breeds) are being sold for about Q700.

Third, there are no indications of the range of data for each type (i.e., variance). The possible result is that relatively few very high or very low values could significantly change the averages given to characterize each type.

Fourth, there are certain internally inconsistent values that cast a shadow over the results. Table 15 illustrates this point. Obviously, either the income figures or the amounts for food purchased for types 4 and 5 are wrong. If, as is very often the case, the incomes are understated, the question is what should those figures be and how would they then compare with types 1, 2 and 3.

Table 15. Income and Food Purchases -- 1987 Survey (in Q)

Farm Type	Total Annual Income	Food Purchased	% of Income	Per Capita Food Purchases
1	2,009	1,628	81%	252
2	2,480	1,950	79%	311
3	2,577	1,319	51%	209
4	736	2,782	378%	522
5	742	1,035	140%	181

Unless future data manipulations perform miracles, the survey does not help very much. However, this is not to say that the Project has not benefited participants, only that the survey does not provide information one way or the other.

Faced with the disappointing results of the 1983, 1985 and 1987 farmer surveys, it might be advisable to look for other ways to measure the impact of AID interventions in the region. USPADA's Statistics Unit generally conducts surveys of production and production costs. Data regarding income, employment and standard of living are typically collected by the Ministry of Economy's Instituto Nacional de Estadística (National Statistics Institute, INE), which thus may be a more appropriate implementing agency for this purpose. INE's NATIONAL SOCIO-DEMOGRAPHIC AND EMPLOYMENT SURVEY OF 1986-87 gathered data on employment, income and housing conditions for a nationwide sample of one per 200 households using a relatively short questionnaire. That might be sufficient to detect project impacts, if applied, with AID financial support, to a denser sample in the project area (based on USPADA's area sample frame) as part of future nationwide surveys.

IV. EVALUATION OF PROJECT ISSUES

A. Research and Technology Adaptation: ICTA

According to the PP, project research and extension were to use the FSR/E approach practiced by ICTA, which was to play a leading role in the Project. Since this has not happened and the approach has occasioned much misunderstanding among project personnel, a brief introduction to FSR/E follows.

FSR/E emerged in the 1970s. It is an approach to the organization and implementation of research and extension activities that directs them toward the provision of appropriate technologies for limited-resource farming. This approach also assumes that research and extension institutions have limited resources. Rather than trying to force farmers to adopt technologies that researchers believe to be appropriate for them, FSR/E seeks to first understand actual farmer conditions before designing technologies which are tailored to their needs.

In ICTA parlance, the four stages of FSR/E are diagnosis, design, testing and extension. In the diagnostic stage, a multidisciplinary team (with both socioeconomic and agro-ecologic expertise) conducts a rapid, informal survey of a selected area, a sondeo, to qualitatively depict the distinctive farming systems in the area and gather sufficient data on each to initiate suitable research activities. The farms of each type or system comprise a homogeneous set or "recommendation domain." Only rudimentary quantitative data are gathered in the sondeo; additional quantitative data are collected later through farm registers and directed surveys, as needed. The sondeo must be conducted by those who will be most directly involved in research and extension activities--it cannot be conducted by outside individuals and the results then given to researchers.

The design stage may or may not involve on-station research, as it may be possible to move directly to on-farm validation and testing. Further, the line between design and testing is arbitrary, since the design stage fades imperceptibly into testing.

Validation and testing are conducted on farmers' fields, and the results, both socioeconomic and agro-ecologic, cycle back to research until an adjustment that is satisfactory to farmers is reached. At this stage, on-farm trials involve some mix of farmer and researcher management, with movement always being toward the farmer end of the continuum, where trials are conducted exclusively under farmer management. Such trials are called "farmer tests."

If a sufficiently large number of farmers who collaborated on the tests continue to use the technology voluntarily on some large area of their farms during the cycle following the tests (ICTA uses an "index of acceptability" to measure this), a decision is then made to release the technology for extension to all farms in the homogeneous set or recommendation domain.

This scheme of sequenced steps is not rigid, for after the sondeo, some technologies move directly into validation and testing. Also, the extension phase really begins with on-farm trials, although extension personnel will ideally participate in all stages, beginning with the sondeo. The line between research and extension in FSR/E is fine since there is a marked tilt toward extension with the on-farm trials--indeed, there have been cases in Guatemala of technologies "taking off" at this stage. The lack of a clear division between research and extension is often a source of tension between the two institutions handling those functions.

Founded in 1973, ICTA pioneered the development of FSR/E in the Americas and is currently the Latin American research institution that is most closely associated with it. Indeed, the approach has achieved institutionalization within ICTA, where staff members do not conduct research any other way. Over the years, the institution has received international accolades and, it is argued, has made Guatemala self-sufficient in basic grains. For a regional project, focusing on corn, rice, beans and sorghum, that is being financed by the European Economic Community (EEC) to promote food security in Central America, ICTA will be in charge of training, and researchers from the region will receive instruction in FSR/E at its training center in Jutiapa. Research success, international recognition and the semiautonomous character of ICTA within GOG administration have combined to make it a unique research institution, not only in Guatemala, but also in Central America.

1. Structure of Technical Assistance Within ICTA

Apart from its internationally recognized expertise in FSR/E, ICTA may be the only national research institution in the Americas that has a well-defined, institutionalized approach to agricultural research. Yet, this expertise was largely ignored during the early period of project implementation, with costly, destructive consequences. For example, it was presumptuous to have a "systems advisor"--the abilities of this individual notwithstanding, he was virtually assured of a frosty reception by ICTA.

2. Two Projects in One

According to the PP, the Project was to increase production and farmer income through diversification, which was to be achieved by strengthening public-sector institutions--the former would be a measure of the latter. However, ICTA had no research capacity in vegetables (except potatoes), deciduous fruits and livestock production when the Project began. When ICTA could not deliver technologies, its institutional strengths were challenged, thus further eroding its leadership of the Project and, at the same time, expanding the role of DIGESA.

The mix of institutional strengthening and production in the short-term may reflect a contradiction on the part of AID. On one hand, there is a desire to strengthen institutions, an area where AID once expended considerable effort, while on the other, there is more recent pressure (perhaps the result of the Kissinger Commission's report) to increase foreign exchange and local incomes through diversification into nontraditional crops. Sporadic pressures on the Project to produce have been great and sometimes disruptive. All of this seems to have led to a slighting of research. For instance, during the early years, ICTA management in the region complained that the Project never envisioned technology validation and testing, so no funds were allocated for this work.

3. Surveys

There has been considerable disagreement and confusion in the Project concerning what kind of surveys should be conducted toward what ends. Substantial resources were committed to surveys, beginning with the Farm Management Survey stipulated in the PP. Conducted in late 1983, by enumerators hired by USPADA and without the participation of ICTA, this survey was not only expected to guide research and extension activities, but provide a baseline for subsequent measures of progress. This survey also included a nutrition component. Because of a series of delays, the results of this initial survey were not available until January 1986. By then, of course, the Project had already selected work sites, and much of the information the survey was intended to provide had no operational value.

What happened with the initial survey provides the best justification for the sondeo, which was developed precisely to avoid this kind of delay. The sondeo provides immediate results that serve to initiate research. For this reason, sondeos must be conducted by those who will be involved in the research and extension effort--the Farm Management Survey did not involve ICTA. Furthermore, the sondeo is not intended to provide a baseline for measuring progress. Another kind of survey is required to do that; the same survey cannot do both.

4. Farm Models and Model Farms

The concepts of "farm model" and "model farm" seem to have generated confusion. According to the PP, the Farm Management Survey was to enable the formulation of "simple conceptual models" (page 14). Such models would be consistent with those emerging from ICTA's sondeo as guides for research. However, the PP goes on to say that those conceptual models are to be quantified and used for simulation exercises involving the introduction of diversified crop complexes. A single complex would consist of some permutation of fruits, vegetables and basic grains. The permutations would then be subjected to economic analysis, with the more promising ones selected for on-farm testing (page 16).

However, ICTA's FSR/E approach does not generate such permutations or complexes, which are too complicated for most small farmers to absorb all at once. The ICTA approach generates and introduces simpler packages. The rationality of this modest approach is confirmed by the project's results--with few exceptions, the technologies adopted by farmers (one or two vegetables, not intercropped) have fallen short of the diversified complexes promoted by the Project on model farms. Thus, the degree of diversity envisioned in the PP for individual farmers has not occurred. Furthermore, some spontaneous specialization seems to have occurred across communities, with different ones favoring varying combinations of products.

The idea that the Project must generate and promote complexes or "tech-paks" seems to have developed among EAT members early on, and may account for the insistence with which they defended the need for team integrity and a location separate from national institutions. If such complexes are to be developed, there is an advantage in having several specialists in the production of fruits, vegetables and livestock working in close proximity.

By mid-1984, the farm model had become a model farm--an actual farm selected at a convenient location to be used for demonstration and training. It was expected that the model farm would serve as a diffusion pole. The decision to make model farms the focus of extension efforts was made by the Comité Regional de Coordinación (Regional Coordination Committee, CORECO), UCPRODA and EAT. The term model farm was changed to "diversified farm" in 1985, reflecting the belief of the EAT team leader that such farms should be 80 percent diversified (whatever that meant) before they could be used for exposition and instruction. The farms underwent yet another name change and became "selected farms" before the idea was finally abandoned in late 1986.

There were 44 model farms in September 1985 and 120 selected farms in late 1986. The Project has been criticized for its use of these farms. The midterm evaluation, conducted in September 1985, stated that model farms were the "better" farms (i.e., not representative) in the area and the technology they were using was "basically untested" (page 55). The evaluation suggested that, henceforth, such farms be considered only as research sites.

5. Lines of Research Inquiry: An Overview

The Project has spurred ICTA to diversify its research capacity. In 1983, a livestock research unit was formed within ICTA. This was a direct consequence of the Project and marked the beginning of livestock research in the Guatemalan highlands. Project resources were also used to construct a laboratory at the Labor Ovalle station for diagnosing plant diseases and identifying pests.

Livestock research has focused mainly on ways to feed milk cows and smaller animals using farm by-products, forage conservation, the treatment of crop residues and silos. A technique for making compost has also been developed to provide fertilizer for crops. Several of these technologies are already being promoted by DIGESEPE. Vegetable research has concentrated on the evaluation of several species' genotypes and determination of economic levels for fertilizer application, and research also continues on potato storage. In the area of fruits, research is underway on fruit physiology and quality improvement through the control of pests and diseases, and management practices, such as pruning and fruit thinning. Studies have also been conducted on fertilization and pruning. ICTA developed a technology for storing and drying fruits (bodegas rústicas) that is now being promoted by DIGESA. Since it takes fruit trees about seven years to mature, the results of fruit research will be forthcoming at a later date.

6. Conclusions and Recommendations

For reasons noted above and elsewhere in this evaluation report, ICTA has not played as beneficial a part in the Project as it might have. Its FSR/E approach, and the unusual fact that it already had an institutionalized approach to technology generation and validation, were largely ignored, especially during the project's critical early years. This led to a waste of time and other project resources on such things as surveys and model farms.

However, there may be a deeper problem. The importance of research was underestimated during project implementation. To a

degree, this may be due to confusion about what constitutes research. For example, validation and testing are very much a part of research. Research results must cycle back in a systematic fashion so that technologies can be modified and thus adapted to the particular socioeconomic and agro-ecologic conditions of the farm milieu. This is as true for vegetables as corn, though the process may be simpler in the case of vegetables. Regardless of who actually does it, adaptation is research and a critical part of FSR/E, and ICTA is the only institution in Guatemala trained in adaptive research.

The roles of research and ICTA in the Project must be reconsidered and fortified. To that end, the following recommendations are made.

First, the FSR/E approach, as practiced by ICTA, should be restored to its proper place in the Project, as follows:

- a distinction should be made between surveys of the sondeo type intended to further agricultural research and extension, and those used to establish a baseline for measuring progress--ICTA should be fully in charge of sondeos, which are part of the FSR/E approach and, above all, the same survey should not be used for both purposes;
- ICTA should strengthen the socioeconomic component of its research efforts in Region I--there is a need for a person skilled in sociocultural and basic on-farm economic analysis, which has become more urgent because of the recent departure of the EAT anthropologist; and
- the Project should formally abandon its effort to develop diversified complexes (comprehensive permutations of fruits, vegetables and sometimes livestock) for extension--farmer resistance to these complexes, as they have appeared to some extent on model farms, has already resulted in their abandonment, as farmers have generally been accepting only one or two novel items at a time.

Second, the Project should abandon the exclusive notion that individual farms must be substantially diversified, and diversify instead mostly along community and regional lines. To an extent, this seems to be happening spontaneously. There are several arguments for this approach:

- the quantity of a given commodity (or two or three) produced in an area would be sufficient to achieve marketing economies of scale;

- the efficiency of the technology adaptation and transfer process would be much enhanced since public-sector efforts would be focused in terms of contents and place;
- the potential for spontaneous interchange of information among farmers regarding production techniques (with benefits for all) would be enhanced;
- there is already a tradition in Guatemala's native communities to differentiate along lines of dress and crafts production--thus, this approach might well capitalize on preexisting cultural tendencies;
- the degree of single-farm diversification sought by the Project may make unrealistic demands on farmers' management capacity and also be uneconomic--the latter problem would seem to increase as farms get smaller, and there are some very small farms in the project area; and
- the approach would still diversify single farms and not interfere with the production of subsistence grains.

Third, ICTA should consider de-emphasizing vegetable variety and validation trials by shifting much of this burden to DIGESA. DIGESA reaches farther into the countryside than ICTA and thus could validate over a much wider area. However, ICTA should supervise these trials and maintain records on them. Of course, this shift would require formal linkages between the two institutions and the training of DIGESA personnel in FSR/E and validation techniques.

Fourth, to complement the above recommendations, ICTA should develop its capacity in pest management now. The need for this capacity is directly related to increases in the area planted to vegetables, which are highly susceptible to pests. The problem is made more acute by an already heavy reliance on pesticides that will only increase as pesticide-tolerance levels rise. The negative consequences for farmers applying the pesticides and the environment are well-known and now visible in areas such as Almolonga. The real need is for a capacity in integrated pest management.

Fifth, in the livestock area, ICTA should place greater emphasis on smaller animals. Farms with large animals seem to be more prosperous or at least those with more land, but many farms in the project area do not have enough land to maintain a cow.

Sixth, ICTA should continue and expand its research on postharvest storage of fruits and vegetables, and quality control for these products.

B. Extension and Technology Transfer: DIGESA

Founded in 1970, DIGESA is the largest institution involved in the Project. It is the main representative of the public agricultural sector in the countryside. DIGESA is bureaucratic and highly politicized, and the motivation, training and abilities of its personnel vary greatly. With some notable exceptions, its staff members do not exhibit the mística of ICTA personnel--the institution has no standard mode of operation and no unifying approach to extension as ICTA has to research.

1. Structure and Scope of Activities

DIGESA is reputedly more active in Region I than elsewhere in Guatemala. Its activities span a broad range, of which agricultural production technology transfer is only a part. This range also includes home economics and youth programs (4-S clubs). In theory, the several aspects of DIGESA's extension efforts work in an integrated fashion to improve the quality of rural life.

Organizationally, beneath the DIGESA regional director are coordinators for several programs, including the improved production of vegetables and fruits, irrigation and soil conservation. Region I is divided into four subregions, which are divided into districts (10 total in Region I). The districts are further divided into operations areas, each with an agencia (about 70 in Region I).

An agencia is typically staffed by an extensionist (perito agrónomo), home economist (educadora del hogar) and promotor of 4-S clubs for boys (the home economist directs the 4-S clubs for girls). In the Totonicapán District, several home economists speak Quiché. The extensionist coordinates the work of the agencia and heads up its team. Two to three guías agrícolas are also attached to the team. They are local farmers, usually innovative and bright, who are paid by DIGESA and theoretically have received formal training at its training center in Quezaltenango. In Indian areas, guías serve as community outreach promoters and enhance the sphere of extension into the countryside.

In late 1986, the GOG designated selected rural residents as representantes agropecuarios. Responsible to the Comité Sub-Regional de Desarrollo Agrícola (Subregional Committee for Agricultural Development, COSUREDA), these are men and women

(guías are always men) who can articulate local needs and concerns to the public sector. The precise role of representantes, who receive a small stipend from DIGESA, is not yet well-defined.

2. Modes of Operation

The extensionist works mostly with groups--in theory, meeting with each group about every eight days, but in reality, less frequently. The guías accompany the extensionist, often as interpreters, and also have their own groups. The extensionist's techniques include field days (probably most common), house visits and technical/practical group instruction centering around demonstration plots. House visits seem to be infrequent and limited initially to motivating farmers to participate in one of the groups.

According to the PP, each diversification district (a geographic area created by the Project, which is homogeneous for the purpose of technology transfer and corresponds only approximately to DIGESA's administrative districts) was to have eight extensionists to serve 480 farmers, equal to "an average of five days direct person-to-person contact between [extensionist] and small farmer" (page 18). However, this figure assumes incorrectly that each agent works only with individual farmers. Rough calculations from Totonicapán District (the administrative unit), where there are seven DIGESA agencias, suggest that extensionists in this densely populated Quiché-speaking area work with 1,200 to 1,600 farmers each (in groups).

Demonstration has played a key part in extension efforts. Model farms represented an important effort until early 1987, when the notion was abandoned because of controversy and the fact that although individual farmers were diversifying, they were not doing so to the degree exhibited in the models. DIGESA has traditionally used demonstration plots established on farmers' fields to show practices to other area farmers. Farmers have also been given tours of Almolonga and Zunil, highly developed vegetable-growing zones outside the project area.

3. The Search for Technology

Inadequate technology, especially for vegetable production, has posed a major problem for DIGESA. ICTA had little to offer (except for potatoes) when the Project began, while AID was pushing hard for results. So, extensionists operated on an unplanned basis, using their own knowledge, what was available from ICTA and what EAT could provide. Through its discretionary funds, EAT was instrumental in the importation of large quantities of vegetable seeds. The EAT vegetable specialist has

introduced new seed varieties, and the fruit specialist visited over 300 farms with extensionists to address problems and provide instruction in orchard management. Since fruit trees take about seven years to mature, many of the results of this effort are yet to be seen.

The pressure for results has sometimes led DIGESA to promote varieties and technologies with little or no prior testing. The research vacuum has also pushed DIGESA into a research role. For vegetables, some extensionists are conducting on-farm trials to test varieties, fertilizer levels, and pesticide application. These are called parcelas de prueba, although the term is not used in the ICTA sense, and the term parcelas de introducción is also used, so as not to antagonize ICTA. These trials generally involve no valid statistical analysis.

4. Irrigation and Soil Conservation

Lack of technology was less of a problem in irrigation, where technology had been developed under an AID-financed project (520-T-026). DIGESA has made a major effort to promote irrigation schemes in the region, and farmer demand for them has been substantial--project irrigation funds, for both credit and technical assistance, were exhausted in early 1987. Irrigation schemes may well represent the most successful DIGESA activity under the Project. However, the irrigation component has not been trouble-free, and some of the problems are worthy of mention:

- since Guatemala has no enforced laws governing water rights, disputes have arisen over rights to water sources for some systems;
- unstable or intermittent water regimes in some areas have meant that systems are not always reliable;
- some farmers, especially Indians, have misunderstood the intent of land-tenure certificates required for a BANDESA loan, which are issued by the local government when farmers present proof of ownership of the land to be irrigated--they see them as land mortgages and are thus reluctant to participate in irrigation schemes. This is part of a general mistrust by farmers of the set of procedures involved in planning, financing and constructing the systems. The refusal of community members to participate not only drives up costs for everybody, but can lead to community friction later, when former skeptics see the benefits of irrigation and petition to participate, yet cannot either for technical reasons or because the community's

leadership forbids it because of the petitioners' former recalcitrance; and

- BANDESA complains that DIGESA sometimes does not select irrigation beneficiaries carefully.

Terracing activities, promoted through social-benefits payments, also seem to have been successful. Guías in several communities said that farmers were continuing to build terraces without payments because they perceived their advantages. However, terrace maintenance needs to be carefully examined by the upcoming evaluation of Project T-037.

5. Home Economics and 4-S Clubs

The work of home economists and 4-S club promotores has not been a major thrust of the Project, though some home economists have provided instruction on the preparation of vegetables for consumption, as has the expatriate vegetable advisor. The results of the work with 4-S clubs are difficult to gauge--one promotor pointed out that youths, a large sector of the national population, are more susceptible to change and, hence, should be the focus of a greater extension effort. He further noted that club work with fruit-storage structures (bodegas rústicas) has sometimes had more effect on involving their parents. Overall, the results of efforts in both these areas have been modest. This is no surprise in the case of dietary practices, a cultural area that is traditionally resistant to change.

6. Conclusions and Recommendations

DIGESA is the largest, most politicized, least agile public agricultural sector institution in terms of its ability to respond effectively and rapidly to project initiatives. It has no institutionalized, unifying approach to extension that is comparable to ICTA's approach to research. DIGESA extension includes not only technology transfer, but also an organizational thrust in home economics and the promotion of youth clubs, which received little project attention. DIGESA was placed in a difficult position when the Project began because, with the exception of irrigation and soil conservation, it had little technology that was ready for transfer. Fruit and vegetable production technologies finally entered the transfer stream (from ICTA, technical advisors and DIGESA's own technicians), but in highly improvised fashion. Pressure for project results awkwardly cast DIGESA in an on-farm research role and sometimes led to the promotion of poorly tested and/or inappropriate technologies. The following actions are recommended:

First, DIGESA should work intensely to promote the safe use of pesticides. This becomes more urgent as the production of vegetables increases, since vegetables are especially susceptible to pests.

Second, DIGESA should consider the use of radio programs that are directed to farmers in native languages. Such programs could help alert farmers to the dangers of pesticides and sensitize them to the need for soil conservation. Programs could be followed by reinforcing field visits to discuss what farmers heard and plan specific actions.

Third, DIGESA should further concentrate its efforts on guias agricolas and work more with representantes agropecuarios. There is some indication that extensionists' communication with farmers is not of sufficient frequency or duration, especially in the region's more densely populated native areas.

Fourth, the Project should be more flexible regarding where it can work in the region, perhaps substituting areas that are now covered, but have little demand for services, with areas which are not covered but have substantial demand for services.

Fifth, the work of home economists and 4-S club promotores should be excluded from the Project. These areas have not represented major thrusts, and merely complicate the Project unnecessarily and blur its focus. Moreover, dietary practices are a most difficult cultural area to change, such that a concentrated, well-focused effort, implemented through a separate project, is needed.

C. Livestock Production: DIGESEPE

Founded in 1978, DIGESEPE is the newest of the four implementing organizations involved in the Project. In terms of personnel, it is two or three times the size of ICTA, but several times smaller than DIGESA. DIGESEPE also falls between those institutions in bureaucratic agility and its capacity to respond to changing circumstances at the regional level.

1. Structure and Scope of Activities

Dominated by veterinarians, DIGESEPE has traditionally been concerned with livestock health and hygiene. When the Project began, 85 percent of the institution's efforts in Region I were directed at preventive medicine for sheep and the usual campaigns for vaccinating chickens, swine, cattle and dogs. Only 15 percent of its effort was directed specifically at production. Due to the Project, DIGESEPE has changed the mix of its

activities to the extent that 70 percent of its efforts are now devoted to livestock production and management.

Beneath the regional director and coordinators for animal health, animal production and small-farmer diversification activities are six DIGESEPE subregional offices in Region I, each in charge of several area offices. An area office is typically staffed by a coordinator and a couple of auxiliary technicians. These technicians are analagous to DIGESA's extensionists, though they have less training. In Totonicapán, where the population density is high, area offices work through representantes agropecuarios and Educación Extra Escolar (EEE) promoters at the community level. Promoters are assigned to the Project, but paid by EEE. Both promoters and representantes are local farmers. For instance, Area I in Totonicapán has three EEE promoters and 30 representantes. DIGESEPE occasionally works with guías agrícolas, but more often with representantes--the guías are regarded as belonging to DIGESA.

2. Modes of Operation

Livestock did not play a significant part in most of the model farms selected by DIGESA, so DIGESEPE did not participate much in the model-farm concept. Instead, it developed and worked with the concept of the módulo pecuario (livestock module), which includes animals, technology, and credit to buy animals and implement the technology. DIGESEPE provides technical support for the módulos. There are módulos for milk cows, chickens, sheep, swine, bees and rabbits, although BANDESA has financed only one rabbit módulo. There has been some experimental work with goats, but there is no goat módulo yet. For small farmers who want them, DIGESEPE has also developed bolsas pecuarias (small-livestock modules that represent a source of income that can be easily converted). There are rabbit and chicken bolsas--their cost is low, and no credit is required. Chickens come with the necessary vaccinations. The bolsa program provides poorer families with meat and eggs, and serves to further interest them in livestock.

Before promoting livestock módulos pecuarios, DIGESEPE technicians instruct representantes agropecuarios (often at a subregional center) on the módulo and its management requirements. In Totonicapán, EEE promoters are also given this instruction, which lays the groundwork for the módulos in the community and enables promoters and representantes to be sources of information. Next, DIGESEPE technicians enter the community and, with the assistance of representantes and promoters, give a course on the módulos to groups of farmers. DIGESEPE technicians then talk further with farmers who are interested in the módulos, after which technicians make arrangements for farmers who want the módulos to talk with a BANDESA agent--a visit to them by

agents of both institutions is arranged. The DIGESEPE agent then prepares a credit plan, which includes both health and nutrition components. Once the credit is approved, DIGESEPE is responsible for providing the technical assistance, which it does through programmed, periodic visits (extension).

3. Diversification Activities

According to the PP, DIGESEPE is "responsible for the livestock extension activities of the Project, which will focus primarily on improving management practices related to disease/parasite control and nutrition/feed supply" (page 58). DIGESEPE already had considerable experience in the former area when the Project began, but little or none in the latter. There was an urgent need for research on nutrition/feed supply, but no national capability: Thus, DIGESEPE, like DIGESA, faced a difficult situation early in the Project. This was gradually resolved with the creation of a livestock research unit at ICTA.

In the Northwest Highlands, animals compete with humans for food, so livestock nutrition is a critical issue. For milk cows, DIGESEPE has promoted oats in association with vetches and hay made from corn leaves, both technologies provided by ICTA. However, the availability of oat seed has limited this promotion somewhat. DIGESEPE has not worked as much with small animals, which require less space and care. Rabbits have been promoted for meat, although the Indians sometimes adopt them as pets and refuse to kill them. DIGESEPE has worked in the area of pasture management for sheep, where the EAT livestock advisor played a major role. All of the livestock módulos incorporate improved management, health and hygiene practices, and seek to use on-farm crop residues to feed the animals and manure to fertilize crops.

4. Conclusions and Recommendations

At the regional level, DIGESEPE has been agile in responding to project demands. The newness of this institution, its relatively small size and capable, stable leadership (a single regional director over the life of the Project) have all contributed to this responsiveness. The ARD evaluation team recommends the following actions:

First, DIGESEPE should place more emphasis on small animals, since few of the numerous small farms in the area can accommodate cows.

Second, DIGESEPE should focus more on women in promoting and supporting small-animal technologies, especially in Indian communities, where women manage the livestock. The use of female representantes agropecuarios may help, but consideration should

also be given to using home economists, some of whom speak native languages and dialects.

D. Research/Extension Linkages: ICTA-DIGESA and ICTA-DIGESEPE

1. ICTA and DIGESA

There has been no formal collaboration between ICTA and DIGESA over the years. Sporadic informal cooperation has been more a function of friendly relations between personnel at the field level. Relations have suffered not only from the usual rivalries between research and extension (sharpened perhaps by the prestige and international attention accorded ICTA over the years), but also from genuine confusion generated by FSR/E, where the line between research and extension is not always clear.

It is significant that the two institutions have come together over the past couple of years in Region I as a result of the Project. Relations are cordial, and the institutions are collaborating in an incipient, though awkward, manner. For example, DIGESA extensionists sometimes help ICTA with on-farm trials, and ICTA invites DIGESA personnel to presentations of its research results. Since 1985, ICTA has invited DIGESA personnel to attend its annual sessions in the region to discuss the previous year's research and prepare operational plans for the following year.

On the other hand, much remains to be done to bring these two institutions together. There is much duplication of effort, especially in the area of on-farm vegetable trials. As part of an effort to link the two institutions at the program level in 1985, a series of seminars was initiated on vegetables and fruits, but interest in the seminars soon waned. The major link between the fruit programs of the two institutions at present seem to be the expatriate technical advisor for fruits.

Although modest, the gains noted above should not be disparaged--indeed, they may be one of the more significant results of the Project and, thus, should be protected and enhanced. The time is ideal to move forward and formalize this fledgling relationship, perhaps making Region I a model for research/extension relations in other parts of the country.

2. PROGETTAPS: An Opportunity

The beginnings of a formal linkage and an ordered research/extension scheme involving both institutions (and DIGESEPE) lie in PROGETTAPS, financed by the Inter-American Development Bank (IDB). Some DIGESA officials also see

PROGETTAPS as an opportunity to put order into the technology-transfer function, which has thus far been part of the general chaos within that institution. There is an irony in the suggestion that PROGETTAPS has something to offer the diversification project, because it was able to analyze the Project, especially during its period of institutional struggles, and thus avoid the same pitfalls. It is also ironic because an institutional rapprochement was forged out of those very struggles. According to one key actor from that time, the diversification project paved the way for PROGETTAPS in Region I.

The key structural unit of PROGETTAPS is a modular team, composed of one member from an ICTA technology-testing-and-transfer team, one DIGESA promoter (extensionist) and 10 "rural leaders" hired by the Project. These leaders are carefully selected local farmers, each of whom organizes and works with a group of 20 farmers. The Project has not yet hired such leaders, but has worked instead with guías agrícolas and with representantes agropecuarios to a degree.

The procedure used by the modular team involves adding a couple of extension steps to ICTA's FSR/E sequence. These come after the parcela de prueba, the last FSR/E step, and include a parcela de demostración and parcela de transferencia. With the exception of the parcela de transferencia, there is nothing new in either the modular structure or its process, but making the scheme work does require coordination and some training of DIGESA personnel in the FSR/E approach. One PROGETTAPS modular team is already functioning in Quezaltenango and part of another in Totonicapán.

3. ICTA and DIGESEPE

Historically, relations between ICTA and DIGESEPE have not been the issue that they have between ICTA and DIGESA. The mandates of the two institutions differ widely, and there is not the status gap between DIGESEPE veterinarians (who run the institution) and ICTA researchers that exists with DIGESA extensionists. Accordingly, relations between the two institutions over the life of the Project have been cordial and productive.

The Project spurred significant changes in both--ICTA created a livestock research unit, and DIGESEPE shifted its program emphasis from animal health and hygiene to production. Thus, the institutions have operated in a mutually complementary fashion, with ICTA producing almost all of the production technologies that DIGESEPE promotes, although there are no formal linkages between the two institutions. As in the case of ICTA and DIGESA, the potential for institutionalizing such linkages

lies in PROGETTAPS, which offers a research/extension model based on FSR/E.

.. 4. Conclusions and Recommendations

During the past couple years in Region I, the diversification project has brought ICTA and DIGESA closer, though no formal linkages between the two have been established. The time is now propitious for such linkages. In seminal form, these linkages lie in the PROGETTAPS model, based on FSR/E, which links ICTA to both DIGESA and DIGESEPE. The model not only offers the prospect of viable institutional linkages, but also promises to put order into the present chaos of DIGESA technology-transfer activities. The evaluation team makes the following recommendations:

First, the Project should follow the PROGETTAPS model to establish research/extension linkages. This should be done immediately, since relations between ICTA, DIGESA and DIGESEPE are good at the regional level and these institutions are already working together in an improvised fashion--much depends on the right combination of personalities in the early stages of institution-building. Further, the current leaders of ICTA, DIGESA and DIGESEPE are committed to the PROGETTAPS model, with the ICTA leaders being especially dynamic.

Second, much of the on-farm vegetable validation and testing should be conducted by DIGESA, which reaches farther into the countryside than ICTA. However, this should be done under the supervision of ICTA, which should monitor all trials and keep records of results.

Third, ICTA and DIGESA should meet regularly at the regional program/director level to report on activities and coordinate actions.

E. Credit

BANDESA was given the responsibility to administer the project's credit and social payments fund. It was believed that the structure, experience and distribution of BANDESA's regional and subregional offices would provide an appropriate base for financing the diversification process. To help BANDESA perform project-specific operations, nominal resources were allocated to strengthen its capacity for loan processing and supervisory functions.

1. BANDESA and AID: Development Financing

BANDESA is a semiautonomous institution operating under the auspices of the Ministry of Agriculture. It accomplishes outreach through a network consisting of its central office in Guatemala, seven regional offices, 40 departmental agencies and 32 local offices (cajas rurales), thus making it readily accessible to a major portion of the agricultural population. BANDESA relies on this hierarchical structure to decentralize and facilitate the agricultural lending process. Region I has six departmental agencies and 12 cajas rurales. Of these 18 offices, 13 are located in the project area.

Over the life of the Project, more specifically in the last two years, there have been important changes in BANDESA policy and operating procedures that have increased the responsibility and independence of regional offices, and made BANDESA's own capital more accessible and responsive to the credit needs and realities of small- and medium-scale farmers. The principal changes are:

- an increase from Q5,000 to Q15,000 for the maximum amount of credit that can be approved at the level of departmental agencies;
- a preferential interest rate for loans under Q5,000 of 10 percent, compared to the usual 14 percent;
- an increase from Q5,000 to Q30,000 for the upper limit on credit requests that can be submitted using only standard bank forms, eliminating the need for an escritura pública and additional costs for lawyers and revenue stamps (three percent);
- an easing of tenure restrictions to make nearly all farms eligible, including owner, renter, usufruct, cooperative and agrarian-reform farms;
- a liberalization of acceptable loan guarantees from a de facto requirement for property mortgages to also include crop and livestock pledges, equipment, and even the applicant's good standing and reputation;
- for medium- and long-term loans, a grace period on interest payments in certain extreme instances;
- concession of credit to nonlegalized groups (sin personería jurídica); and
- specifically including nontraditional crop production and marketing as eligible activities.

In Region J, 75 to 80 percent of the loans are under Q5,000 and processed in BANDESA's local offices by credit agents. It is estimated that the increased accessibility of BANDESA's own funds will allow them to account for about 25 percent of the loan portfolio in 1988, up from five to 10 percent in previous years. The principal source of credit funds has been and will continue to be the several trust funds that BANDESA administers.

As a result of the liberalization of loan terms, and a new orientation that includes nontraditional crops and activities (e.g., marketing), BANDESA's potential clients correspond very closely to the target groups that AID has traditionally serviced. However, the trust fund mechanism still affords advantages that could achieve AID objectives, as it did in Project 520-T-034. It:

- precisely defines the target group;
- precisely defines target activities; and
- modifies certain loan terms that AID may wish to influence, including requiring the use of technical assistance and technology, controlling interest rates, specifying individual loan ceilings and payback periods, allowing social payments (i.e., non-reimbursable transfers) and financing high-risk, experimental or pilot activities which are not usually consistent with bank lending criteria.

The BANDESA lending process is lengthy and competes for scarce resources (especially personnel) that could be better used for other activities, such as loan recovery. For first-time applicants, the time required to complete this process can vary from a minimum of a week, for loans approved at the local level, to two months, if central office approval is needed. Before a loan is granted, 16 steps and an equal number of forms must be completed. If the application is received from February through May, long delays may be experienced, which can affect the timeliness of credit disbursement. Each year, there are approximately 4,000 to 5,000 clients who must pass through all the steps in the process, severely overloading field staff in the region.

In an effort to reduce the time and resources needed, BANDESA has established various classifications of clients, based on previous credit experience. For those in good standing after two or three years as bank clients, the procedures and time for credit approval are greatly reduced--in most cases, one-day disbursement is the norm. For these same clients, a new mechanism for multiple-cycle loan approval is being evaluated for short-cycle crops using T-034 and IDB 630 trust fund monies. This innovation is possible due to the 30- and 36-month payback

periods allowed by these trust funds, respectively, and will permit one-time approval for up to six crop cycles.

Additional modifications in BANDESA procedures should be examined to improve the responsiveness of regional and local offices to credit demands. There is a need for more flexibility in shifting funds between activities once a work plan is approved by the central office. Currently, transfers from one activity to another (e.g., fruit-tree crops to livestock) must be resubmitted to the central office for authorization before a regional director can balance allocations and demand.

2. Diversification Credits in Region I

BANDESA's Region I offices annually handle 7,000 to 10,000 credits, totaling about Q12,000,000. With this volume, the person-hour requirements for manual data manipulation and analysis make these important activities prohibitive. The administration of Region I is aware of this need, and recognizes the limitations it imposes on loan concession and recovery, and program evaluation. The additional reporting requirements for trust-fund operations exacerbate this situation, as does the decentralization of BANDESA's offices. At the moment, it is very difficult to monitor accounts in a timely manner and nearly impossible to obtain up-to-date information on changes in the portfolio.

3. Credit and Input Availability for T-034 Activities

The levels of loan financing for short- and long-term activities and soil conservation efforts are adequate and closely reflect actual costs. Vegetable and fruit production credits are based on BANDESA cost-of-production estimates, which were similar to cost calculations from other sources, especially during the project's later periods. The cost allowances permitted farmers to purchase all the inputs needed to conform to technical recommendations. Reasonable variations from average cost estimates are accepted, so for credit beneficiaries, financing is not a limiting factor for diversification. In the case of purchased chemical inputs (e.g., fertilizers and pesticides), the credit authorized was adequate to enable farmers to buy from private distributors. This was an important option, since the MAGA scheme for providing low-cost inputs was unreliable, while the private-sector network offers timely delivery and sufficient supply.

The availability and quality of vegetable seeds are not as reliable as chemical inputs. However, seed availability in the local market probably reflects a condition of uncertain demand. As species and varieties appropriate to the area are identified

and demand stabilizes, problems with availability and reliability should be resolved.

Costs and credits for financing mini-irrigation and livestock activities were calculated on a case-by-case basis. BANDESA was guided by the farm plans drawn up by DIGESA or DIGESEPE extension agents. Projects accepted for financing conformed to extensionists' estimates, not pre-calculated BANDESA cost limits. However, payback experiences with livestock modules show a need for BANDESA and DIGESEPE to review, in particular, the profitability of the milk-cow module and corresponding credit line. The long-term payback schedule for mini-irrigation projects does not permit conclusions regarding loan recovery for this activity.

Social payments for soil conservation works were calculated using the amount of land terraced and a predetermined, per area allowance, which varied from Q0.03 to Q0.05 per square meter, depending on the zone. At these rates, only about 30 percent of the labor costs for terracing were subsidized by social payments.

4. Implementation of T-034 Credit

BANDESA is concerned about its ability to adequately service the increasing credit needs of the agricultural sector in Region I and also achieve and maintain an acceptable loan recovery rate. To handle all T-034 credits, the bank received a total of four additional agents--BANDESA had to shift agents from other projects to serve T-034, thus reducing its overall effectiveness. It is estimated that a credit agent can effectively supervise 200 to 250 clients, and the present client load is nearing the upper figure at about 245 farmers per agent. This high client load manifests itself in a default rate of about 35 percent (averaged for all BANDESA clients) due to inadequate time for client screening and supervision, and loan recovery.

BANDESA claims its delinquency rate for T-034 operations is only 10 percent. The evaluation team finds this estimate is unrealistic and based on inappropriate accounting procedures. Indicative is the situation regarding livestock credits (the only ones where an up-to-date delinquency rate is available thanks to DIGESEPE's computerized system). It is claimed that in August 1987, only 4.27 percent of the livestock loans were in arrears. However, this calculation is based on comparing the amount in arrears to the total amount of approved loans. The point is that up to August 1987, only 11.52 percent of the loans outstanding came due (since livestock loans are medium-term)--comparing the 4.27 percent collected to the 11.52 percent due, the effective livestock delinquency rate was 37 percent. In the absence of evidence to the contrary, there is no reason to believe that the

delinquency rate on T-034 credits will be much different from BANDESA's overall delinquency rate, which is about 35 percent.

A long-term benefit has been the incorporation of diversification activities into BANDESA's normal operations; however, in the short run it has placed additional strain on BANDESA's scarce field-agent resources. Given the current budget and personnel capacity of BANDESA, it is likely that its credit agents will face increasing client loads in the near future.

Contributing to this imbalance is the basic conflict in performance goals imposed by the Project on the extension institutions and BANDESA. Performance indicators in the T-034 project implementation plan explicitly place a priority on quantity rather than (and probably at the expense of) quality. Stated, identifiable objectives are couched in terms of:

- number of farmers;
- number of hectares;
- number of animals, fruit trees, courses, etc.; and
- dollars (quetzales) of loan concessions.

Annual extension planning for T-034 is directed toward meeting the numerical goals established by the Project. Annually increasing the new client loads for both the extension and credit agents has reduced their ability to provide sustained technical assistance to farmers previously selected. It has compromised client selection criteria and limited BANDESA's ability to channel necessary resources into client monitoring and loan recovery.

5. Conclusions and Recommendations

First, the trust fund mechanism can be more than just a means of transferring project funds to finance specific activities. It also provides an opportunity to introduce and test innovative changes in the lending process to increase effectiveness. The project design process should consider the trust fund as an activity whose purpose is to develop and improve finance operations, which are very often a primary obstacle to implementation.

Second, computerization of BANDESA's main office in Region I is needed as soon as possible to effectively administer and monitor its loan portfolio. The bank is seeking ways to reduce the time required for loan processing and permit better control of outstanding credits. Given personnel shortages and increasing loan volumes, computerization is a partial solution. Since

Region I continues to be a focus for development activities, computerized bank records would be invaluable for tracking and analyzing this process, thus permitting modifications whenever conditions indicate their necessity.

Third, client selection and loan criteria should be more closely coordinated between the extension institutions and BANDESA. While both the extension and credit agencies have a major responsibility for increasing technical and financial coverage of the agricultural sector, it falls on BANDESA to impose an adequate level of economic rigor to assure the bank's integrity and ability of borrowers to meet their obligations. While these criteria may slow the rate of expansion for technical and credit assistance, they will develop a mechanism for improving quality and permanence. For each type of assistance, estimates should be made concerning the time required for farmers to acquire self-sufficiency. New clients should be brought on only as the current load permits, and extension and credit capacity increases.

F. Marketing Nontraditional Crops in Region I

Public-sector concern regarding vegetable marketing has been evident for several years, expressing itself in policy statements, strategies and project proposals. However, to date, no systematic approach has been taken to define the public sector's role and responsibilities in the marketing process. The most recent actions taken by MAGA, in the face of difficulties with marketing vegetables, have centered on the creation of CORSEPE in 1984. CORSEPE is a commission operating under COREDA, composed of delegates from each participating institution, with the exception of the Instituto Nacional Forestal (National Forestry Institute, INAFOR) and addition of the Instituto Nacional de Cooperativismo (National Institute for Cooperatives, INACOP). CORSEPE's stated functions are coordination and oversight.

In response to a directive from the Minister of Agriculture in mid-1986, the public sector sponsored the establishment of farmers' markets in Guatemala. In late 1986, CORSEPE drew up a plan to expand the idea to include a biweekly farmers' market in Quezaltenango. The purpose of and rationale for these activities were to improve the price producers received by avoiding intermediaries, and the quality and price of products that consumers purchased. The plan envisioned the participation of all of COREDA's member institutions, apparently regardless of their usual function.

The orchestration of this undertaking was extremely complicated. For example, materials for constructing market stands were the responsibility of INDECA (a marketing

institution), the job of building and taking them down was given to ICTA (a research institution), and the task of transporting materials to and from the market site was assigned to INAFOR (a forestry institution that was not even a member of CORSEPE). The development bank (BANDESA) was in charge of radio and television advertising. The crop and animal extension agencies (DIGESA and DIGESEPE, respectively) assembled the products, after CORSEPE told them where to look. Finally, prices for the products sold were monitored by DIGESEPE, collected by INDECA and analyzed by CORSEPE, although CORSEPE has neither resources nor personnel of its own.

Early in 1987, after witnessing the nightmare of carrying out this plan, CORSEPE* proposed a more encompassing concept to coordinate vegetable marketing and production. Coincidentally, this was the direction the EAT advisor had taken six months earlier. Since that time (April 1987), there is no evidence that CORSEPE has contributed anything to the domestic marketing of vegetables or their export. The fiasco of CORSEPE's intervention in farmers' markets has been discussed here to illustrate the dangers of the public sector embarking on agricultural marketing without a well-conceived definition of its proper role.

After CORSEPE withdrew from the farmers' market operation, this responsibility was absorbed by INDECA, which continues to sponsor this activity with only peripheral help from the other agricultural sector institutions. INDECA has expanded the coverage of farmers' markets to a point where 13 cities will be included by the end of 1987. To coordinate product supplies to these markets, it has established five collection sites that are equipped to provide the basic necessities for selection, preparation and staging, and has begun to collect and distribute market price and availability data. The principal public-sector resources contributed to this activity have been the labor of INDECA personnel. INDECA has not received any T-034 project funding or technical assistance.

According to INDECA sources, 59 farmers' markets were initiated up to October 1987, where over 2,000 producers have participated in selling nearly 1,000 tons of produce. While this figure is insignificant compared to the 100 tons per day that are exported to El Salvador from the Almolonga area and 230 tons per week of vegetables produced for export by the Cuatro Pinos cooperative, INDECA farmers' markets have served two important functions--moving fresh produce to many areas which are remote from the production region and demonstrating to farmers that

*For 1986 and 1987, references to actions by CORSEPE refer principally to its coordinator (who is also the DIGESA representative), the only officer who is more than marginally active.

there are alternative markets to those where they have traditionally sold their output. On the other hand, the farmers' market plan is a politically inspired emergency measure that begs the question of defining an institutional function in the marketing process and continues state paternalism as the solution for economic problems. A worrisome sign is that prices at the farmers' markets are determined by INDECA and sometimes not respected by producers.

1. T-034 Marketing Effort

Original T-034 project activities did not include a marketing component, although the national authorities participating in project design suggested one, since AID believed that a separate marketing project, COMERCA (520-0238), would provide sufficient support for the production-oriented activities of T-034. Well into project implementation, AID became aware that COMERCA's failure to provide a marketing structure was becoming a serious constraint to the diversification process--cases have been documented where farmers plowed their vegetables under for lack of a market, reverted to cultivating maize and beans, and defaulted on their BANDESA credits.

In September 1986, a full-time marketing advisor joined EAT, with a scope of work born of desperation rather than concern for effectively identifying and institutionalizing the public sector's role in marketing. As a result, although an important beginning has been made in generating a working data base for the T-034 project area and arrangements are being finalized for marketing a portion of the production generated by project activities, the responsibility and participation of the public sector remain undefined. In addition, neither the Project nor GOG have provided budgetary support for the development of markets or a marketing component. The work of the marketing advisor has concentrated on four areas:

- generating basic information;
- identifying, organizing and advising producer groups;
- locating markets and negotiating marketing contracts; and
- coordinating activities with elements of the private sector.

Basic information is needed to make appropriate marketing decisions and conduct knowledgeable trade negotiations. The information generated during 1987 by the marketing advisor included production costs and yields for vegetable crops in the

project area, wholesale prices in promising markets, and supply and demand estimates for major crops in selected markets.

On the supply side, the advisor's work focused on mini-irrigation projects, where year-round production is possible. Using a large sample survey, an inventory of production potential was made and certain projects selected as primary production sites. Farmers in these mini-irrigation projects were then counseled regarding the requirements of domestic and export markets, including crop selection, production programming and quality control. Finally, in response to growing output and potential future growth, and the absence of alternatives, the advisor directly sought production outlets. Principal contacts have been made with two supermarket chains in Guatemala that together purchase over 6,000 tons of vegetables per year and major buyers in southern Mexico with an annual demand of over 8,000 tons per year. Contracts are in the final stages of negotiation, and vegetables have been planted to provide the first deliveries by the end of the year.

The demands placed on the marketing advisor, as defined in the scope of work, displayed the same critical flaw evident in the overall project design--simultaneously requiring development of institutional capacity and attempting to use a capacity that does not yet exist to produce specific results. In the case of the marketing activity, the institutional base has also yet to be defined. Though the scope of work contains elements of a public-sector marketing structure, it does not systematically lead to institutionalization of that structure. The T-034 marketing activity has led to wholesale contracts which, when finalized, will provide an ad hoc, partial solution for some of the Western Highlands' new vegetable producers. However, the major remaining concern is defining the public sector's role in a national market structure and creating the institutional capacity to perform that role.

2. Future Marketing Design

The issue of what the public sector should do regarding the marketing of vegetables and other nontraditional crops has as its converse, a consideration that is perhaps more important--what the public sector definitely should not do. Experience has repeatedly shown that there are functions in a marketing structure that the public sector cannot perform well, while others are best placed within the public domain. The public sector is particularly weak in the actual trading and movement of produce. Normally, the public sector is utilized for:

- technical assistance,
- infrastructure,

- organization and training,
- weight and quality control, and
- information.

The GOG has had experience in the basic grains market for many years, though this should not be taken as an indicator that it has any particular vocation for or expertise in agricultural marketing. On the other hand, it has not acquired many bad habits, nor an institutional infrastructure to which it is already irrevocably committed. However, it is now felt that services of some sort must be provided, especially in the area of nontraditional crop marketing, to support the growing number of inexperienced producers and increase export volume.

Before discussing possible areas of participation for the public sector, two cautions should be kept in mind:

- functions should be assigned to the public sector and, in turn, to appropriate institutions in a very judicious, conservative manner--additional functions and institutions can be added quite easily, but it is nearly impossible to eliminate or shift bureaucratic responsibilities and infrastructure; and
- institutional development is a slow process, even with a relatively large financial input--in the long run, viability and relevance are best served by building capacity in a rational fashion, considering needs, priorities and available institutional and human resources.

Under the present functional organization of GOG and MAGA, in particular, the responsibility for "agricultural commerce" resides with INDECA (according to Ministerial Decree No. 101 of 1970) and is principally to define policy, stabilize prices, and provide and store products. So far, INDECA has limited its activities to stabilizing the supply and price of basic grains, but in exercising its mandate, INDECA has established a national network of offices, and purchasing and distribution points. The structure and legal base that INDECA possesses cannot be ignored in determining the public sector's role in marketing. If INDECA is bypassed, it is more than likely that another institution will be created, at considerable financial cost, which will be in direct competition with INDECA.

The proper role of the public sector in agricultural marketing is supporting the private sector in the several aspects of the agricultural chain, including elements that seem only remotely related to marketing, but are, in fact, vital to the

successful selling of agricultural products. In this context, the GOG is already providing services which complement those that relate more specifically to marketing per se. The construction of access roads (farm-to-market) is of obvious importance and an ongoing public-sector activity. Agricultural research and extension regarding marketable crops and varieties provide the materials and technologies needed to produce a selection and quality of products that are acceptable on national and international markets. The GOG has these institutions in place, and each is gradually placing greater emphasis on nontraditional and export crops. Soil conservation and irrigation infrastructure, which extend the productive capacity in area and season, are consistent with developing a market-oriented agricultural sector, and the GOG has already adopted this mentality to a large extent.

Because of legal decisions that have already been made, it is time that INDECA be recognized officially as the principal marketing entity in the public sector. Once this is done, it must be decided which functions it should initiate activities with and at what level. This should not be a unilateral decision by INDECA, but rather of MAGA, USPADA and the several other actors in the agricultural sector. The sequence should be to have the GOG define what it will do in marketing, decide which functions in that plan correspond to INDECA and, then, of those specific functions, begin with a limited number of high-priority, precisely delineated activities. The primary objective is not to create or expand an institution, but rather use it to improve agricultural marketing.

Market development is the key to a successful diversification effort and must include the expansion of the domestic market as well as gaining access to export markets-- these are complementary activities. The domestic market is a captive one for national producers, but for this market to function, all participants must have access to reliable, current information concerning buying and selling alternatives. A market information system is a natural function for INDECA. One option for a well-designed plan to develop a system to meet current and future needs is to begin by forming a small office at INDECA with an emphasis on information management, analysis and dissemination, leaving the actual information-gathering to be contracted out. This would allow time to identify the optimal system without institutionalizing infrastructure and personnel that may later prove to be inappropriate. This flexibility permits changes and experimentation until an effective system is established, at which time decisions can be made regarding long-term operation.

A second function that is needed immediately to improve agricultural marketing is the organization and orientation of producers and producer groups (e.g., mini-irrigation projects).

The objective would be to create a business orientation and capability within these groups to enable them to make rational marketing decisions. The organizational form should be left for the farmers to decide--at present, because of the spotty record of marketing cooperatives, they usually prefer to form farmer associations. A small office at INDECA would be able to coordinate and oversee this task and, again, perhaps contract out the actual work of creating and advising these organizations.

While this preliminary national-level structure is being set up, it would be advantageous to start the information service and farmer-group organization on a pilot basis in Region I. This would build on the base already established by INDECA in that region and logistically support INDECA with GOG and AID resources (e.g., computer, photocopier, motorcycles). It would also use existing INDECA personnel who, because of the seasonal nature of marketing basic grains, are unoccupied during most of the year, and appropriate training in price dissemination and farmer-group organization.

Finally, a small office of activities concerned with quality control would round out the scope of INDECA's foray into the marketing process. This function would have INDECA taking the lead in assuring that Guatemalan produce is acceptable for the several markets sought. One of the most urgent needs in this area is monitoring chemical residues in produce and soil. Close coordination will be required with ICTA, DICESA and perhaps the Instituto Centro Americano de Investigación y Tecnología Industrial (Central American Institute for Technological and Industrial Research, ICAITI) for recommendations, transfer and testing, respectively.

If INDECA were able to undertake these three functions, at a modest level initially, as part of a GOG decision regarding its role in agricultural marketing, an important step would have been made. The precise nature and level of activities must be decided in the context of GOG policy, priority and resources. It is also necessary for the private sector be aware of GOG decisions and actions, and INDECA to be constantly attuned to private-sector needs and circumstances.

Perhaps the second most important institution that must be included in the market process more actively is BANDESA. Rather than launching itself into direct participation in produce marketing, the public sector should place itself in a position to financially support the private sector in establishing the necessary infrastructure and trade channels. To date, the bank has not incorporated marketing into its portfolio, although both T-034 and IDB's Project 620 specifically allow farmers to receive credit for marketing their production. The marketing intermediary has been purposely excluded from public bank credit programs. It is time that the chain of individuals between

farmers and consumers be recognized as an integral part of the system. Not only must the public sector accept this fact, it must also extend its support to include this vital link. A good example of the reluctance to recognize the role of intermediaries is the organization of farmers' markets. Instead of trying to integrate farmers into a more advantageous position along the chain, the public sector sought to bypass the chain completely.

3. Recommendations

First, in this light, credit policies should be developed to enable the bank to support private initiatives in infrastructure development (e.g., packing and staging facilities, market structures, transportation) and the generation of working capital. Domestic- and export-market expansion is going to require innovative marketing, some of which will need public-sector backing.

Second, DIGESA will likewise have an important marketing role in:

- determining production costs and dates, areas cultivated and expected production;
- advising producers regarding quantities and varieties demanded by markets;
- phasing the planting calendar to avoid seasonal market gluts; and
- promoting on-farm storage facilities (e.g., for potatoes and apples).

Third, as its name implies, CORSEPE should be regarded as a committee to coordinate the marketing activities of INDECA, DIGESA, BANDESA, etc., on a regional basis--in no case as an implementing agency with a budget, personnel and logistics set up in direct competition with INDECA. In this respect, CORSEPE should not differ from the regional disciplinary interinstitutional teams for the various subjects (e.g., ICTA-DIGESA for vegetables and fruit, ICTA-DIGESEPE for livestock). Thus, CORSEPE should be a "mini-COREDA," composed of officials from the several agencies who are responsible for marketing and charged with planning, programming and monitoring marketing activities. To avoid the CORSEPE/INDECA conflict of the past, it is proposed that INDECA's representative (which is, by definition, the lead institution in agricultural marketing) will be CORSEPE's president and the DIGESA representative, its secretary. To make CORSEPE effective, it must include a representative from the private sector (Gremial de Exportadores), as a full or, at least, an ex officio member.

G. Project Coordination

The Small Farmer Diversification Systems Project implied an unprecedented amount of coordination among the regional implementing agencies. The Project was to be coordinated regionally by COREDA, which is composed of the heads of all MAGA services in any region--BANDESA, DIGESA, DIGESEPE, ICTA, INDECA and INAFOR. COREDA was recognized by the PP as the principal coordinating mechanism for the public agricultural sector at the regional level. It was to be backstopped by USPADA (the MAGA national-level planning unit) through UCPRODA, a project coordination unit set up specifically for the Project with AID funds and consisting of a project coordinator, accountant and secretary.

At the working level, the PP envisioned that ICTA's technology-testing teams would work in close coordination with DIGESA promoters, and periodic meetings between researchers and extensionists would occur to provide feedback. An annual meeting of research and extension officers was planned to discuss the past year's results and plan future research activities. The extension/credit link was not specified.

The Comisión Superior de Coordinación (Superior Coordinating Commission of MAGA, COSUCO) was not given a specific role. It played a larger part at project inception when the activities of the various institutions were defined, and a diminishing one after the Project became operational.

The project coordination unit (UCPRODA) was set up to expedite project administration. Its scope of work makes it clear that it was intended to assist the operating agencies in preparing documents necessary for disbursements and progress reports, and promote active coordination of the various agencies involved. However, in the leadership vacuum that existed because CORECO's performance had not yet been organized, the project coordinator (a former ICTA technical director, with more interest in technical than administrative matters) saw his job as managing the Project by issuing technical directives which the regional heads of the implementing agencies were not prepared to accept from a person outside the GOG hierarchy. In addition, there was a breakdown of communications between the coordinator and first FAT team leader.

In the end, this turned out to be beneficial in a perverse way, as the regional heads activated COREDA, which hitherto had been mostly nominal, and learned to work together to present a common front against the project coordinator. Finally, COREDA became a functioning organization and the coordinator reoriented himself to act as its secretary.

1. Functioning of COREDA

In 1982, CORECO was set up specifically for the Region I diversification project. However, in mid-1986, it was reabsorbed by COREDA, and the announced MAGA policy is that COREDA is the supreme representative of MAGA in each region.

At present, the COREDA in Region I is functioning satisfactorily and is reputed to be the best in Guatemala. Since 1986, a unified ANNUAL OPERATING PLAN OF PROJECT 520-0255 is prepared for all participating agencies, with specific targets and implementation schedules for project activities in every municipio. Each project technician receives the portion of the annual plan concerning their activities. The positions of COREDA president and secretary are rotated every six months among the regional heads of the six MAGA agencies, and current relations among the regional heads are collegial. COREDA meets once or twice a week. When project affairs are discussed, the heads of agencies not concerned with the Project (notably INAFOR) are excused and other parties concerned with the Project (notably the head of EAT) invited.

In sum, thanks chiefly to the diversification project, the COREDA of Region I is a functioning organization. It seems a more appropriate entity than the former CORECO for project coordination--the disadvantage of having the head of INAFOR, which is not a party to the Project, as COREDA president once every three years is more than outweighed by its superior authority, including a direct link to the minister's office. COREDA's chief weakness now is the lack of a permanent secretariat to prepare its agendas and assure follow-up on decisions.

2. Regional Agricultural Planning Unit (URPA)

At present, USPADA is concentrated at the central level. MAGA has announced its policy to decentralize USPADA by establishing a branch named URPA in every region, which will be charged with regional agricultural planning, monitoring and evaluation, and act as a permanent secretariat for COREDA (not superior or equal to COREDA, although MAGA Decree No. 51-81 defines the USPADA regional representative as the "regional chief"). URPA will take administrative actions necessary to assure continuity in the implementation of COREDA decisions by the implementing agencies--for this reason, the term "permanent" secretariat is more appropriate than "executive" secretariat. URPA will follow-up on all COREDA activities, not just those concerned with the diversification project. Thus, it will take over UCPRODA's planning and coordinating functions, limiting UCPRODA in the future to its administrative and financial role.

with the installation of URPA, the existing post of COREDA's rotating secretary will disappear. URPA will consist initially of a planner, an analyst and a secretary. It is expected that one of these individuals will be contracted (possibly with a salary complement from AID PL-480 funds) and the others seconded by the regional MAGA agencies.

The plan is to establish URPA in the first quarter of 1988, in the framework of a Food and Agriculture Organization/United Nations Development Programme (FAO/UNDP) project for the reorganization of USPADA. A second task of URPA will be to compile the requests of the communities for mini-projects (channeled through representantes agropecuarios), prioritize them and then transmit them for implementation by appropriate GOG agencies or private voluntary organizations. Figure 2 shows the proposed organizational chart for future diversification activities in Region I.

3. Project Monitoring

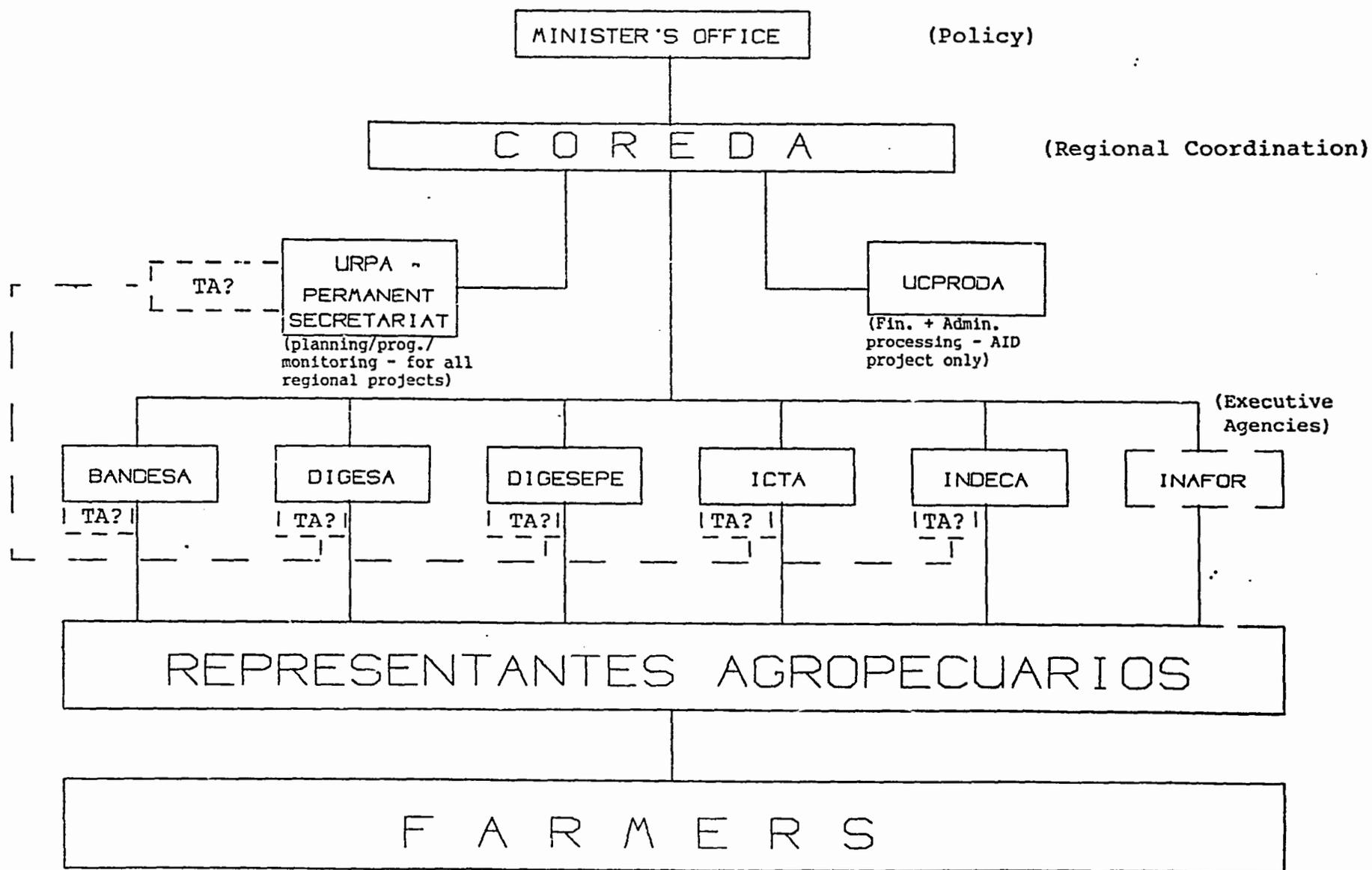
The quarterly monitoring reports that are now compiled by UCPRODA using data from the implementing agencies contain an overabundance of detail without explanations of divergences between planned and achieved targets or conclusions of operational significance. These progress reports should be converted into management instruments by streamlining the detailed reporting of activities, and adding analysis of implementation problems encountered and corrective measures that are necessary at different levels.

H. Technical Assistance Team

The PP called for three research specialists in vegetable production, fruit trees and animal husbandry for three person-years each; an agricultural economist and sociologist for one year each; three extension specialists (in soils and irrigation, livestock management and crop protection) for three person-years each; and two years of short-term assistance. This gave a total of 22 person-years plus 15 person-years for a local-hire project coordination team, consisting of a coordinator, accountant and secretary. Two points in the PP design deserve mention:

- it clearly states that the three research specialists were to "establish farm systems analysis programs within the ICTA agronomic/social analysis

Figure 2. Proposed Organization Chart for Diversification Activities in Region I



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TA? = Possible short- or long-term technical assistance according to needs as defined by COREDA.

philosophy"--it is thus clear that the PP intended to follow ICTA's FSR/E methodology, but other parts of the PP (especially the programming of an extension effort before ICTA had a validated technology, farm-models approach and large farmer surveys) are not congruent with ICTA's approach, which leads to the conclusion that the PP design team did not have an adequate understanding of the FSR/E methodology; and

- there was no provision in the PP for a full-time team leader, nor any mention that advisors would not be attached to research and extension services, as is normal practice, but the institutional affiliation of the advisors was not made clear either.

During negotiations with MAGA, the technical assistance was reprogrammed to provide for an expatriate team leader (2.5 person-years), vegetable, fruit, livestock and farm management research/promotion advisors (two person-years each) and three person-years of short-term advisors. Following GOG policy of that time, expatriate advisors needed to have Guatemalan advisors as counterparts, so six long-term Guatemalan advisors were included--vegetable, fruit and livestock research/promotion specialists, an agricultural economist, farm management specialist and socio-anthropologist.

A PASA agreement for the expatriate technical assistance was signed on 26 July 1983 with USAID, due to the insistence of the Minister of Agriculture in office and without a competitive bidding procedure--in the end, only one of the advisors was a USDA employee. Each advisor was supposed to be "working with the responsible GOG official at ICTA and DIGESA." Still, the contract said nothing about the advisors' institutional location. The PP was amended on 30 March 1985 to extend the PASA and Guatemalan long-term contracts, and add more short-term assistance and long-term expatriate advisors and national counterpart advisors in irrigation and marketing. The technical assistance as it was actually implemented is shown in Table 13 (see Section III).

1. Institutional Affiliation

The expatriate advisors have demonstrated knowledge of their respective fields of specialization, adequate language skills and generally good relations with their counterparts. However, because of the first team leader's idea that EAT should be a service unit to all the institutions, and capitalizing on the lack of clarity in the PP regarding the location of technical assistance, EAT was established as practically an institution

apart, physically and organizationally separate from the national implementing agencies. Until recently, the regional authorities have had very little say about the advisors' scopes of work, much less the choice of individual experts and day-to-day orientation of their work. ICTA was particularly bitter about this, since in practice, the expatriate advisors were mostly oriented toward extension and field-trial work, and none regarded ICTA as their primary institutional link.

While this situation allowed the advisors considerable latitude to carry out the work that was most useful in their professional judgment, the evaluation team finds that EAT's semiautonomous status has not been in the best interest of strengthening the capacity of the public agricultural sector, which was the project's purpose. Although EAT members strongly feel that their autonomous status made their daily activities more efficient, it made them less effective with regard to the project purpose. On repeated occasions, the national authorities have demanded the attachment of individual advisors to particular institutions. For good reasons, this is the normal practice in international assistance and, under dynamic team leadership, it should not detract from team spirit and cohesion.

It must be reiterated that the above comments regarding the undesirability of maintaining EAT as a separate institution should not be construed as a criticism of individual EAT advisors. They have performed as competent professionals in their respective disciplines.

2. Guatemalan Technical Assistance

In the negotiations with the host government which led to the PP amendment of 30 March 1985, the policy of the Minister of Agriculture at the time was that EAT should hire national counterparts outside the public sector for the expatriate advisors. They were supposed to orient the expatriates during the initial period and also acquire knowledge for future application in Guatemala. In actuality, this practice had poor results. The differences in salary and conditions between the Guatemalan advisors and expatriates' public-sector counterparts gave rise to friction and, in several cases, there were personality conflicts between expatriates and their counterparts. Also, it is not clear how and where any knowledge these counterparts have acquired would be applied to future small-farm diversification. Regardless of the qualities of individual counterparts, the practice of hiring national counterparts as a part of EAT did not contribute specifically to the project's purpose of strengthening the public sector's capacity to stimulate diversification.

This should not be confused with hiring a national professional as a sole technical advisor, as in the case of the irrigation advisor. Whenever there are qualified national candidates for any technical assistance position, every effort should be made to employ them. This would reduce costs and contribute to the GOG policy of "Guatemalization" and AID policy of privatization. In other words, future Guatemalan technical assistants should be contracted in the role of full-fledged advisors, not as apprentices to expatriate advisors.

3. Future Technical Assistance Requirements

Future technical assistance should be more selective, concentrating on the felt needs of regional authorities. COREDA should take the initiative in drafting a technical assistance plan, starting with the real needs of institutions rather than a continuation of the current situation. COREDA should be equally involved in drafting of scopes of work and selecting individual advisors. The need for every existing post should be reevaluated. It is expected that future expatriate technical assistance would be more oriented toward short-term intervention. The most important long-term (two-year) expatriate advisor positions that can be foreseen are in:

- marketing, which has been identified as the the project's most significant problem--as discussed in Section IV.F, the marketing advisor should be attached to INDECA; and
- integrated pest management, as increased vegetable production is certain to greatly increase pest and phyto-sanitation problems.

The need for continued long-term technical assistance in vegetable, fruit and livestock production should be carefully assessed in conjunction with the services concerned, making them conscious of the fact that technical assistance, even if it is financed with grant funds, is not "free," since the same funds could be used for other purposes, such as equipment procurement.

The short-term technical assistance requirements identified by the ARD evaluation team or expressed by regional authorities are in:

- goats and other small stock,
- animal epidemiology,
- fruit quality and conservation,
- streamlining BANDESA loan procedures, and

- assessing agro-industrial potential in Region I.

It is expected that the overall size of the technical assistance team will be reduced to the point that a full-time team leader will not be needed, especially once the proposed URPA is functioning with a qualified Guatemalan planner (GOG contract employee), as planned. The shift from the current EAT setup to the mode of technical assistance proposed here should be implemented so as to assure only minimal disruption of ongoing activities. Certain contracts could be prolonged into 1988 on a short-term basis to assure a smooth transition.

I. Training

By design, training was to play an important part in the Project, though in neither the PP or project implementation has it been defined and focused very well. The PP planned for eight Guatemalans to receive master's-degree training abroad, but this was subsequently modified by AID Project Implementation Letter No. 19 of 23 May 1984, which committed loan funds to a more ambitious training program, involving long- and short-term training abroad. That program called for training at the master's level for six employees of ICTA, two from DIGESA and two from DIGESEPE, and short-term training (up to six months) in several topical areas for 195 employees of DIGESA and DIGESEPE, about 75 percent of it abroad. However, this modified program was never implemented.

National economic austerity measures led UCPRODA and MAGA to approve only two master's degrees for ICTA (in vegetable and fruit production), while DIGESA and DIGESEPE withdrew their requests for master's-level training in favor of shorter courses. However, the training budget did not include airfare for the short courses, and MAGA could not cover the difference. So, a decision was made to conduct all short courses in-country. MAGA's Human Resources Unit was asked to prepare a training program, which was subsequently rejected because 80 percent of the courses were about administration and only 20 percent on technical matters. The Interamerican Institute for Agricultural Cooperation (IICA) was then approached to contract with foreign technical personnel to deliver short courses in Guatemala, and an agreement to that effect was drawn up. However, the agreement was rejected by AID on the grounds that IICA would become a beneficiary of training funds. Thus, the only remaining alternative was for public-sector institutions to take the resources and train themselves at home using their own personnel.

To accomplish this, a demonstration and training center was to be constructed at ICTA's Labor Ovalle research station in Quezaltenango. The center was never constructed, and the DIGESA training center, also in Quezaltenango, has not served the

Project well because of poor facilities and management. Also, it has not been entirely open for use by other institutions participating in the Project.

The in-service training of extensionists in the new center was to be conducted by subject-matter specialists from ICTA, EAT and DIGESA. The PP mentions eight subject-matter areas, such as orchard and crop management, insect control, soil and water conservation. Numerous training activities have been conducted, both in the field and classroom, in those eight areas by ICTA, DIGESA, DIGESEPE and EAT. The PP also stipulates that "small-farmer orientations will be held in limited groups throughout the year" (page 22), using guías agrícolas to orient farmers to the techniques and benefits of diversification. This has certainly happened on a large scale.

Although training under the Project has slighted all the participating public-sector groups, there has been a tendency to neglect extension more. In Guatemala and elsewhere, it is sometimes felt that only researchers should have access to select training opportunities, while extensionists should take what is left. Constant favoring of research in this way demoralizes extension personnel and further deepens rifts between the institutions.

EAT is charged in the PP with developing curricula and materials for the in-service training of ICTA, DIGESA and DIGESEPE personnel, but this did not begin until the middle of 1986. About that time, EAT came to see training as a separate area, involving materials development, needs assessment and the training of trainers. EAT has developed a considerable body of materials, including technical manuals, overhead transparencies and graphics on vegetable and fruit production, prepared for farmers with the help of EEE. Several extensionists in the region commented favorably on the manuals and requested wider distribution. Some of the overheads, such as those prepared to inform farmers about irrigation, appear to be quite promising, though they have not yet been fully tested in the field.

As the result of a push by AID earlier this year, EAT training activities are now at fever pitch, with a panic effort underway to produce materials and other results before the Project ends. The Project recently contracted a materials specialist, who is functioning as a training coordinator and trying to develop a comprehensive training plan. Furthermore, EAT is now on a dual training track--it is trying to provide instruction in the techniques of training through training-of-trainers courses that are now underway as well as in diversification techniques. While the purpose of the former is to expedite the latter, the idea of training to train is new to public-sector employees in the region (and also several EAT personnel) and will not be absorbed quickly. In a word, it is

hard to see where all the training efforts are leading. The Project is not yet poised to capture their benefits.

1. Indians and Ladinos: A Sociocultural Problem

To achieve diversification objectives, the public sector must work closely with farmers. Much of ICTA's research is on farms, and on-farm communication is the essence of extension work. Both FSR/E and the PROGETTAPS model assume tight researcher/extensionist/farmer linkages, and effective communication at the public-sector/farmer interface is a must. However, there is much evidence that communications at this interface are often ineffective. The reason relates to the Indian-Ladino problem in Guatemala. In the project area, public-sector officials are Ladinos, while farmers are overwhelmingly Indian, and the age-old pattern in Guatemala is that the Ladino talks while the Indian listens. The status gap between the two is considerable and attempts to bridge it often meet strong resistance from Ladinos.

The public sector tries to use guías agrícolas, and now perhaps representantes agropecuarios to deal with this problem. Those individuals are "culture brokers"--Indians who can function reasonably well in a Ladino world. They link the public sector with the communities. The guías receive formal training at the DIGESA training center in Quezaltenango before being attached to extension teams working in their communities. From the viewpoint of public-sector officials, the guías are Indians and often treated as such. Communications are one-way, from Ladino to guía, and few efforts are made to close the status gap. The burden rests with the guía and Indian farmers he represents to accommodate themselves to Ladino demands. Again, the old pattern--the Ladino talks, the Indian listens.

It should be clear that the link between guía and extensionist (perito agrónomo) is vital, but for the relationship to function optimally, the extensionist must also be willing to listen and learn from the Indian guía. Communications must flow in both directions. Only if the extensionist knows how to listen can he be fully responsive to farmers' needs. Consequently, training efforts should focus strongly on this link, especially on the perito extensionists. ICTA personnel who work at the farm level should also be included for there is evidence that researcher/farmer communications could also be much improved. The training objective should be to alter the style of interaction between public-sector officials and guías in such a way that communication flows in both directions.

In contrast, the returns from training efforts directed at improving communications between guías and farmers are likely to be less. Few Ladinos (or North Americans) have the skills to

train at that level, and it has to be assumed that guías and farmers will communicate reasonably well spontaneously since they share a common culture.

Efforts by the Project's former anthropologist to improve communications between extensionists and guías were met with much indifference and some hostility--indifference because few public-sector agricultural officials have much understanding of sociocultural phenomena (or persons specializing in them), and hostility because the idea that Ladinos should listen and learn from Indians is threatening to some Ladinos. So, there is a real challenge to training in this sensitive area, and results are likely to be slow. However, the effort must be made nonetheless.

It is difficult to be more specific regarding the content of such training without more time to observe actual behavior than was available to the evaluation team, but a couple of comments may stimulate thought. First, guías sometimes seem to be marginal members of the extension team--they often do the "dirty work," going to the farms farthest away, with neither transportation nor per diem. Second, it may be possible to reduce the social gap by involving guías more with the team--e.g., inviting them to attend key team meetings and take an active role in the decision-making process at the agencia level. For example, a couple of representantes agropecuarios will soon become members of the COSUREDA in Totonicapán. This is commendable as long as it is not merely a token gesture.

2. Conclusions and Recommendations

Training has not played the important role in the Project that was intended for it. Of the eight Guatemalans originally slated for master's-degree training abroad, only two will complete it, and all of the short-term overseas training that was planned was canceled in favor of less costly training conducted largely by Guatemalans in-country. There has been much training of this kind in all the Project's component areas.

EAT has never developed a needs assessment (the basis of any rational training plan) and did not begin training activities in earnest until mid-1986. Much of the effort since then has been directed toward materials development, and there is now a sizable body of technical manuals, overheads and poster graphics. Not all the materials have been field-tested, but some have been well received and others show considerable promise. The push to develop materials and other products before the end of the Project reached panic levels earlier this year in response to AID pressure. A materials-development specialist was hired, who is now functioning as training coordinator, and the Project has embarked on the training of trainers. Too much is happening too fast.

Over the life of the Project, training has lacked direction, a problem stemming in large part from a lack of clear lines of authority, and well-defined institutional and individual roles. The need now is for a modest, well-focused training plan. Considerable training effort should be directed at the extensionist/guía agrícola relationship, since this is the key link between the public sector and Indian farmers. The following recommendations are made for training.

First, if the PROGETTAPS model is adopted by the Project to link research (ICTA) and extension (DIGESA and DIGESEPE), as is recommended by this evaluation, the Project should consider the following training plan:

- a seminar/workshop should be conducted for the regional directors and program coordinators of ICTA, DIGESA and DIGESEPE in the FSR/E approach and its links to extension;
- seminar/workshops should be conducted for members of ICTA's technology-testing teams and their DIGESA and DIGESEPE counterparts on the PROGETTAPS modular teams;
- training should be given to members of ICTA's technology-testing teams and their DIGESA and DIGESEPE extension counterparts in communicating effectively in the rural milieu--PROGETTAPS has already given thought to such a course, which is a variation on the training now received by DIGESA extensionists;
- training should strengthen communications between extensionists and guías agrícolas or representantes agropecuarios, and training should address the Indian-Ladino relationship, as discussed in the preceding subsection; and
- other types of training should be identified, as needed, once the PROGETTAPS research/extension linkage structure is in place.

Second, two individuals from ICTA should be trained at the master's level in integrated pest management and two from DIGESA in agricultural communications.

Third, participating national institutions should be permitted to define their short-term training needs and identify personnel to provide them. This is part of making training and technical assistance--the distinction between the two is fuzzy--more responsive to actual institutional needs.

Fourth, a training coordinator (a Guatemalan) should be attached to the Regional Planning Unit (URPA) that is soon to be established in Region I. This person would work closely with COREDA to plan and execute project-related training activities, including the programming of short-term training technical assistance, when needed.

J. Project Management and Administration

1. AID Project Management

The first AID project manager, from September 1982 to November 1985 (before September 1982, the Project was not operational), had a laissez-faire attitude. This lack of leadership had several negative effects on the Project:

- start-up activities took an inordinately long time--not until mid-1984 was the initial technical assistance team fully on board and the Project moving;
- equipment purchases were delayed (33 months between the first presentation of ICTA procurement lists and AID approval) and, hence, so was construction;
- the Project was allowed to drift away from the FSR/E methodology to what national agencies viewed as a "nativity-scene" approach to diversification--trying to have a little bit of everything on each farm;
- the EAT team was allowed to set itself up as a separate organization;
- ICTA, having lost the leadership role envisioned for it in the PP, technical assistance and logistic support, was understandably alienated from the Project; and
- the implementing agencies did not have sufficient guidance in AID procedures, which slowed disbursements.

The second AID project manager, from November 1985 to May 1987, devoted much of his efforts to having implementing agencies utilize project resources (e.g., vehicles, spare parts, fuel) within the Project's geographical area and generally adhere to the ProAg. Because of this shift from laissez-faire management to a more directive approach, the regional authorities and technical assistance team complained of interference by this project manager, which curtailed his effectiveness.

Only the third project manager (since June 1987) has provided the right mix of direction and flexibility, so that relations between AID and the implementing agencies have greatly improved and all the parties involved are pulling as a team.

2. EAT Management

The AID project management problems were reportedly exacerbated by the initial EAT leader (November 1983 to May 1986), who unfortunately also had a laissez-faire management style. Under his leadership:

- EAT was set up as a separate institution, which was resented by all the implementing agencies;
- EAT embarked on a model-farm approach, contrary to ICTA's "vocational area" approach, which was finally vindicated;
- EAT advisors received little direction and supervision in formulating and executing their work plans;
- EAT advisors were perceived as working mostly one-to-one with farmers, as opposed to achieving a multiplier effect by training GOG agents;
- training needs assessments and an overall training plan were not realized; and
- the results of the 1983 survey only became available in 1986.

The technical assistance team leader was also in conflict with the UCPRODA project coordinator, which did not help matters. Nevertheless, due largely to the leadership exercised by the DIGESA regional director, the regional services slowly started cooperating, notably through CORECO and the interinstitutional discipline groups.

The present EAT team leader (since May 1986) is a social scientist with a profound knowledge of Guatemala--unfortunately, he is not perceived as exercising strong leadership either. His acknowledged inexperience in administration was counteracted only in October 1986 by the contracting of an EAT Guatemalan administrator.

EAT leadership problems were exacerbated by insufficient USDA home-office support and supervision. Paradoxically, although farmer surveys and training are two of USDA's

traditional strengths, in this Project, these were precisely the two aspects which showed the least satisfactory results.

In sum, while the individual expatriate advisors (all but one of whom were not USDA employees but contractors) have worked as competent professionals, the overall management of the team offers no convincing reason to prefer a sole-source technical assistance contract with USDA over the normal procedure of open competitive bidding in the future. During the interim period of bridge financing, it may be better for administrative reasons to continue with the USDA contract for those advisors whose services are requested by COREDA, but for a follow-on project, a fresh start seems advisable.

3. Exchange-Rate Variations

The PP was prepared when Q1.00 was worth US\$1.00, as has historically been the case, and it is perhaps unreasonable to expect the authors of the PP to have planned for fluctuating exchange rates. Project cost estimates were made in local currency, as is typically the case. However, when the quetzal dropped to over 2.50 to the dollar and costs rose accordingly, no corresponding adjustment was made in project budgets, with the result that allocations were insufficient for many purchases, yet the Project was unable to spend its entire AID funding--of the total of US\$9.196 million, at least US\$2.2 million will remain on 31 December 1987.

This is particularly notable for BANDESA, which by 31 August 1987 had expended 85 percent of its AID allocations in quetzals (Q5.2 million), but this amounted to only a fraction of its AID dollar allocations (US\$3.044 million). However, in the bank's case, this was probably a blessing in disguise, since it could not have used much more funding efficiently owing to the lack of logistic support.

4. Budget Advances

In general terms, the procedure for disbursing project funds is as follows:

- AID issues a Project Implementation Letter on the basis of the regional Annual Operating Plan;
- each implementing agency solicits and receives a quarterly advance from the GOG's Global Revolving Fund (GRF);
- the regional office makes expenditures and submits vouchers, with receipts, to the central office;

- the voucher is submitted to UCPRODA, vetted by the vice-minister of MAGA and submitted by UCPRODA to AID;
- the voucher is examined by the AID accounting office and project manager, and a cable dispatched to the AID regional office in Mexico to issue a check for the reimbursable expenditures; and
- AID informs UCPRODA, which then informs the implementing agency, which picks up the check and presents it to the GRF to reimburse the advance.

Just within AID, the procedure takes four to six weeks, and considering the time required for voucher preparation and vetting, two to three months usually pass between the withdrawal of funds and reimbursement (for equipment purchases and construction, the procedure is considerably longer). Although UCPRODA has issued a manual on processing reimbursements, the implementing agencies' administrative offices are still insufficiently familiar with the procedures (in fact, the different agencies have varying versions of the procedures), and communications often lag, causing undue delays.

The GRF originally demanded that all advances for a given quarter be reimbursed before advances for the next quarter were authorized, which inevitably caused funding blockages at the beginning and end of each quarter. Recently, it has relaxed its requirements, allowing 90 days between the issuing of each advance and its reimbursement, and accepting a photocopy of the voucher presented to AID (with AID's stamp of reception) as proof that reimbursement is on the way and authorization to issue a new advance. However, GRF resources are limited (only Q10 million for all externally financed projects), and fund fluidity still presents a major constraint to project implementation.

5. Recommendations

To facilitate project implementation, the following administrative improvements are recommended.

First, each participating agency should assign officials to be specifically responsible for project administration. These persons, as well as administrative directors at the regional and central levels, should receive training in GOG and AID financial and administrative procedures. This training should be given jointly to officials of the different agencies (e.g., implementing agencies, USPADA, Ministry of Finance). Key officers should be sent to short courses in planning, programming and administrative systems at the National Public Administration Institute (INAP) or elsewhere.

Second, approval of the project's Annual Operating Plans by AID suffers from undue delays because regional authorities are unable to prepare the plans to AID's satisfaction without extensive revisions. Thus, the Project Implementation Letter approving the 1987 plan was issued only on 28 April 1987, so AID monies could not be disbursed before that date. In previous years, the delays were even longer. Closer cooperation is required between the regional services, UCPRODA, EAT and AID at the time of plan preparation (at the end of the preceding year) in order to formulate a plan that can receive speedy AID approval.

Third, the implementing agencies, GRF and AID should agree that vouchers may be presented every few weeks--at present, some parties claim that all vouchers for a given quarter must be presented together at the end of the quarter. UCPRODA should assure that implementing agencies present their vouchers without delays. To this end, a capable replacement should be found for the departing UCPRODA administrator.

Fourth, MAGA and AID should negotiate an arrangement with GRF whereby each operating agency would be authorized to draw budget advances for a second quarter before reimbursing the first-quarter advances, but would be eligible to receive advances for the third quarter only after it has reimbursed (with MAGA or AID funds) all first-quarter advances. In this way, the flow of operating funds will not be interrupted. The official in charge of GRF has indicated a willingness to implement this procedure for the diversification project in Region I.

Fifth, to further facilitate disbursements of AID funds, AID should establish a project bank account to be managed by UCPRODA. Operating agencies would submit pro forma invoices to UCPRODA for purchases to be made with AID funds (with a copy to the Ministry of Finance). After vetting by the vice-minister, UCPRODA would issue a check in favor of the supplier. AID would replenish the account whenever it has been drawn down to a certain point.

Sixth, EAT had a grant-fund budget line that it could draw on in US\$20,000 tranches (altogether some US\$100,000 will be used) to meet necessary expenses for such purchases as seeds, sending trainees to seminars, etc., with AID approval, but without going through the usual GOG procedures. This discretionary budget was invaluable in enabling the Project to respond with agility to needs as they arose, and much of the Project's impact can be attributed to it. It is strongly recommended that a similar feature be included in future projects, especially those of an innovative nature where some needs cannot be foreseen.

Seventh, equipment purchases should be made from national suppliers, whenever practical, in order to accelerate delivery and assure better servicing.

Eighth, the installation of computers in the Region I directorates of BANDESA, DIGESA, ICTA and INDECA (with modem connections to their national headquarters), and possibly at UCPRODA and URPA, should be given a high priority to facilitate financial management, improve loan monitoring, and process agricultural and marketing cost data. Photocopiers are also badly needed for processing reimbursements, since every document must be presented in several copies. A needs assessment should be made of required hardware and software, and appropriate training provided.

V. CONCLUSIONS

A. Impact at the Farmer Level

In terms of production and income, all indications are that the Project has had a significant positive impact on its beneficiaries. While limitations on the statistical confidence of the sondeo's results should be noted, this exploratory survey found a significant difference between beneficiary and non-beneficiary farms in terms of farms' added value (soil conservation and mini-irrigation infrastructures), working capital, investments, production (volume and variety), net income, capacity for expenses and diversity of the household's economic base. According to the sondeo results, the group of "agricultural selected beneficiary farms" (i.e., those farms directly assisted by project personnel) is better off than indirect beneficiaries which also received extension and credit assistance. Some measures of this are:

- only beneficiaries produce vegetables or have fruit trees growing on areas under soil conservation;
- horticulture is clearly more widespread among beneficiaries than non-beneficiaries;
- beneficiaries produce, sell and consume considerably greater quantities of all vegetables;
- beneficiaries produce remarkably greater amounts of livestock and/or subproducts, and also earn much larger incomes from livestock sales than non-beneficiaries;
- the Project is making important contributions to livestock improvements outside the livestock modules, including improved animal nutrition and the storage of forage; and
- "agricultural selected beneficiaries" are using 30 percent less land for traditional crops than non-beneficiary farms.

The early results of the large survey (1,142 respondents) carried out in 1987 also found the income of project beneficiaries was greater than non-beneficiaries, although this study was deficient in many respects such that the actual numerical values cannot be used with confidence.

The production targets set in the PP have lost much of their meaning as measures of success, considering the many changes the Project has undergone. Nevertheless, it can be stated that the

Project has achieved 35 percent of its original target for mini-irrigation, 114 percent for soil conservation, 35 percent for vegetable production, 120 percent for fruit-tree plantations and 58 percent for livestock modules, for an overall weighted achievement rate of 60 percent. Based on actual planted areas and conservative assumptions regarding spread effects, the Project has achieved a satisfactory IRR of 15 percent.

B. Shortcomings in Project Design

The PP had several deficiencies which negatively affected project performance, the most serious ones being:

- national authorities were minimally involved in PP design--in particular, the Project was predicated on the FSR/E approach, but did not take into account the fact that its original lead institution (ICTA) had a different, well-established approach to FSR/E;
- the Project did not include a marketing component--the assumption that the "marketing infrastructure provided under Loan T-030 is in place" proved to be woefully unrealistic, so consequent marketing problems have seriously limited potential project achievements and their extent is only beginning to be felt, as market limitations are beginning to constrain the expansion of vegetable production and threaten credit recovery;
- BANDESA was not provided with sufficient personnel and logistic support--this has left the bank badly overstrained and gives cause for alarm regarding the recovery of project credits (if present trends continue, the loan default rate is projected to be about 35 percent);
- the project purpose (institutional development) was measured in terms of production outputs, which pressured project management into directing most of its resources toward extension rather than research, alienating ICTA in the process--the project design aimed to build institutional capacity and also use that capacity (which did not yet exist) to produce concrete results in the field, and the time frame was much too short for the methodology envisioned, given that ICTA did not have proven vegetable, fruit and livestock production technologies at the project's inception, thus obliging DIGESA, DIGESEPE and EAT to resort to improvised technologies;

- EAT's role was not clearly defined--for all intents and purposes, this resulted in EAT developing into a separate institution;
- the Coordination Unit was placed in conflict with the authority and responsibilities of regional implementing agencies;
- the PP's "farm-model" approach was too complex for farmers to adopt as well as contradictory to ICTA's approach;
- technology validation and testing were not adequately conceptualized by the Project--because the focus was on technology generation, validation and testing did not receive sufficient financing; and
- the initial baseline socioeconomic survey was overly ambitious and inappropriate to guide the research on diversification systems.

C. Implementation Problems

The Project got off to a rather slow start and, during its four-year life, has suffered from frequent changes in (five ministers, five vice-ministers, three ICTA general managers, three DIGESA general directors, three USAID mission directors and three USAID project managers) and insufficient leadership, which have clearly limited its potential effectiveness.

Insufficient definition of authority and responsibility has impeded project implementation. Notably, the AID-contracted project coordinator (head of UCPRODA, not part of the public-sector hierarchy) was placed in conflict with the regional directors of BANDESA, DIGESA, DIGESEPE and ICTA, who viewed his instructions as interfering in their internal affairs, a situation which definitely curtailed his effectiveness. The Coordination Unit was also not familiar enough with AID procedures, which unduly slowed procurement and the construction of buildings to house a laboratory, training center and other infrastructure.

Poor communications have compounded the above problems. A Spanish translation of the PP was apparently sent to central-level authorities in 1983, but was given only limited and late distribution to regional authorities. Thus, they did not have a clear idea of what they were to implement. The regional authorities feel that not until a November 1985 joint meeting did they obtain a clear overall view of the Project.

The first USAID project director provided inadequate leadership and guidance for national authorities who were unfamiliar with AID procedures. This caused inordinate delays in equipment procurement (33 months from submission of the first list to its acceptance by AID) and construction, and also allowed EAT to establish itself as a separate entity. The laissez-faire attitudes of the first project manager, combined with the laid-back style of the first EAT team leader, divisiveness of the UCPRODA project coordinator and deficient USDA home-office backstopping, did not create an adequate management team for starting an innovative project requiring the cooperation of several public services that were hitherto more accustomed to competition. The DIGESA regional director probably did more than anyone to make COREDA a functioning organization.

The project's quetzal budgets were not adjusted following devaluation of the quetzal, with the result that loan funds were not fully disbursed, while other project items were underfunded (notably credit for mini-irrigation projects) and, consequently, project targets were not reached.

D. Strengthening Public Agricultural Sector Capacity

Most of the problems mentioned above are now in the past, and the project's rate of progress is clearly accelerating. Its important institutional achievements include:

- current high-level MAGA authorities support the project's goals;
- the COREDA in Region I has started to work as a team and is reputed to be the most effective in Guatemala;
- the implementing agencies are learning how to efficiently administer AID financing;
- ICTA has established research units for vegetable, fruit and livestock production;
- DIGESA has increased its extension activities in vegetable and fruit production;
- DIGFSEPE has integrated animal production into its traditional veterinary-care activities, has begun supervising livestock credits and is becoming oriented toward livestock farm management;
- BANDESA has incorporated diversification loans (for vegetable, fruit and animal modules, mini-irrigation and soil conservation payments) into its normal

activities and devotes a large part of its staff resources to these objectives; and

- although not included in the original project design, INDECA has begun to be involved in fruit and vegetable marketing--it provides producers with information concerning fruit and vegetable prices in all major Guatemalan markets and organizes farmers' markets where groups of farmers transport produce to markets far outside the region for direct sale to consumers.

E. Research and Technology Adaptation

ICTA's institutionalized approach and FSR/E expertise were largely ignored during the early period of project implementation, with costly, destructive consequences throughout the project's life. The initial EAT leadership seemed unfamiliar with the FSR/E method and unwilling to apply it. As a result, much time and resources were wasted--for example, on inappropriate large surveys and model farms.

The PP "farm-model" approach envisioned permutations of complex technical packages for the production of vegetables, fruit and livestock on the same farm, but this was profoundly at odds with ICTA's approach of incremental changes in existing farming systems. Furthermore, the initial EAT approach of working with farms that were "already 80 percent diversified" was opposed to ICTA's focus on a cross-section of representative farms. During implementation, farm models were changed to "model farms" and subsequently "diversified" or "selected" farms, thus vindicating ICTA's simpler approach of incremental changes.

As a result of the disregard for ICTA's approach, technology validation and testing were not sufficiently emphasized, and adequate funds were not allocated to them. Project leadership underestimated the importance of ICTA's adaptation research.

In spite of the above problems, important research achievements have been made, notably:

- a livestock research unit was established at ICTA;
- techniques for feeding livestock with crop residues and composting livestock wastes for crop production have been developed and are being promoted by DIGESEPE; and
- a technology for fruit drying and storage has been developed by ICTA and is being promoted by DIGESA.

F. Farmer Surveys

The results of the large farm surveys were definitely not proportional to the considerable financial and technical resources invested in them. The 1983 survey of 700 farms was conducted in all 64 municipios included in the Project at that time, with insufficient interviews in each one. Its methodology was at odds with ICTA's sondeo approach, ICTA was not involved in its implementation, and the results became available only in 1986. Consequently, this survey had no value in orienting project research and only very limited use as a baseline for measuring project impact. The USPADA crash survey of 1,000 farms done in February 1985 (without ICTA involvement aside from contributing a questionnaire that could not be utilized) could not even be processed. The results of the 1987 survey of 1,142 farms include such severe internal inconsistencies that their dependability is in serious question. The small 1986 sondeo (conducted on a sample of 100 farms with a much shorter questionnaire) could have been more useful operationally, if its data analysis had been more adequate.

G. Research/Extension Linkages

Historically, relations between ICTA and DIGESA have not been very close. However, over the past couple of years in Region I, their relations have been unusually good, though not formally structured. Relations between ICTA and DIGESEPE have been excellent throughout the project's life.

The PROGETTAPS project has created a formal link between ICTA and DIGESA through a well-structured research/extension procedure. The PROGETTAPS team in Quezaltenango has been cooperating satisfactorily.

H. Family and Youth Development

The PP intended to work through DIGESA's home economics agents (educadoras del hogar) to improve family nutrition and through 4-S youth clubs to teach new or improved agricultural practices to the younger generation. Because of the weakness of the services involved, administrative obstacles and priority given to other project components, practically no family- or youth-oriented funds were disbursed. These activities merely served to unnecessarily complicate the Project and blur its focus.

I. Credit

BANDESA's client population is potentially very much the same as AID's target groups. Recent important changes in bank policy have greatly increased small- and medium-scale farmers' access to credit.

Per hectare credit allowances are based on realistic costs and do not pose a limiting factor to diversification.

BANDESA's loan procedures are unnecessarily complicated (e.g., 16 steps for first-time applicants), but their flexibility is increasing (multiple-cycle loan approval).

In terms of the availability of inputs, fertilizer availability from private suppliers is satisfactory. Vegetable seeds are sometimes scarce, but supplies should improve once demand conditions for both varieties and quantities stabilize.

Regarding loan defaults, credit targets stress quantity (number and amount of loans) at the expense of quality (credit recovery) and BANDESA personnel are badly overloaded and short of logistic support (e.g., office machines, computers, vehicles). Consequently, client screening and supervision are inadequate and the default rates high--the overall BANDESA default rate in Region I is 35 percent. The apparently low overall default rate on project credit (10 percent) is deceptive, since most credits are long-term and have not yet come due. By comparing the amount in arrears on livestock production units with the payments due, the projected default rate is 37 percent.

J. Marketing

The public sector's role and responsibilities in marketing perishable crops have not yet been systematically defined. This lack of policy has resulted in poorly conceived actions, such as CORSEPE's fiasco in organizing farmers' markets in Region I and its unnecessary conflict with INDECA.

INDECA, which is the GOG agency mandated to handle agricultural marketing, has traditionally confined its activities to basic grains, but has made a promising entry into vegetable marketing in Region I by providing market price information and organizing 59 farmers' markets without a budget for this new activity or support from other GOG agencies or AID. INDECA needs policy guidelines in order to play an appropriate role in disseminating market information, organizing marketing groups, overseeing grading and standards, and refraining from price-setting.

The Project did not include a marketing component, based on the woefully incorrect assumption that the COMERCA project (520-0238) would fulfill this need. Insufficient vegetable markets are becoming a serious constraint for the Project, limiting the adoption rate of project-promoted technologies and causing some farmers to plow under their vegetables and default on their credits.

Technical assistance in marketing was only finally initiated in late 1986, still without an operating budget or guiding policy--which prevented advisors from working with INDECA, among other things--and saddled with the task of developing institutional capacity while also arranging for the disposal of project production on a crash basis.

K. Technical Assistance Team

Regarding institutional location, due to a particular set of circumstances and contrary to the PP's intentions, EAT was established practically as an institution apart, physically and organizationally separate from the national implementing agencies. Until recently, regional MAGA authorities have had very little say about the scopes of work for advisors, much less the choice of individual experts and their work plans. EAT's semiautonomous situation has not been in the best interest of strengthening public agricultural sector capacity, which was this project's purpose. Although EAT members strongly feel that this autonomous status made their daily activities more efficient, it made them less effective in terms of the project purpose. ICTA has been particularly bitter about this situation, and national authorities have repeatedly demanded the attachment of individual advisors to particular institutions, as is the usual practice with technical assistance.

USDA's home-office support and supervision of EAT have been inadequate, allowing problems to continue without decisive action being taken. Paradoxically, although farmer surveys and training are two of USDA's traditional strengths, it is precisely data analysis and the training needs assessment that have been the least satisfactory aspects of EAT's performance.

In terms of advisors' counterparts, the policy of hiring national counterparts outside the public sector for expatriate advisors has produced poor results. In several cases, friction developed between counterparts and expatriates or expatriates' public-sector counterparts, and any knowledge they have acquired has not been institutionalized. Regardless of the individual counterparts' qualities, the policy of hiring Guatemalan nationals as counterparts for expatriate EAT team members did not contribute to achieving the project purpose of strengthening the public sector's capacity to stimulate diversification. On the

other hand, hiring a qualified national professional as an advisor in his own right has shown good results.

L. Training

Structured project training efforts began only in mid-1986 and focused primarily on the development of manuals and other materials. However, recently there has been a serious attempt to start establishing a training master plan to determine priorities and set specific training objectives. In early 1987, AID pressured EAT to direct its efforts toward training, which led to a series of hastily planned activities. Although these were beneficial for the trainees, their impact on project objectives could not be substantiated.

Long-term training has fallen far short of PP objectives because of a decision made early on to concentrate on short-term training, which was not carried out either. Only two Guatemalans were sent to the United States for master's-level training instead of the eight originally planned.

M. Overall Conclusions

In sum, this was an institutionally ambitious project that aimed to coordinate the activities of four MAGA agencies to an extent never before attempted, and its progress in this respect is encouraging. In spite of serious shortcomings in conception and implementation, the Project has made considerable advances because it responded to a felt need and opportunity in Region I and, consequently, was supported and adopted by the beneficiary population. MAGA authorities at the highest level have demonstrated their strong, continuing support of the Project. The regional agencies involved have made a commitment to common action, and there now exists the opportunity to make rapid progress on the basis that has been established.

Despite all their shortcomings, the extension services--DIGESA and DIGESEPE--are still the strongest part of the diversification effort. The weakest links in the Project are the near-total lack of organized marketing for new products, logistic inadequacies of BANDESA which threaten credit recovery, and very limited research capacity for testing, adapting and validating new vegetable, fruit and livestock production technologies.

VI. RECOMMENDATIONS

A. Future of the Project

There are three possible avenues of action at the PACD:

- terminate AID assistance,
- continue the Project as it is, or
- expand and/or modify project activities.

This evaluation recommends the third alternative.

The Project's results and potential amply justify continued AID involvement with small farmer agricultural diversification in the Guatemalan highlands. Such involvement could be structured as a second phase of the present project with important modifications and expansions.

AID should schedule a planning team to arrive as soon as possible to prepare the PP for the follow-on project. GOG regional authorities should designate representatives to work with the AID team on project preparation. The PP's general orientation should be based on the 1988-1991 diversification plan prepared by COREDA.

Funds remaining on 31 December 1987 in the project's loan and grant should be authorized as bridge financing until the ProAg for the follow-on project takes effect. However, these funds will not be sufficient to continue activities at the current level, and additional funding sources should be sought.

Given the emphasis on strengthening regional agricultural services, large number of small farmers in Region I and limited coverage of this region by the present project, the follow-on project should remain in Region I to capitalize on the institutional infrastructure that has been created there. Due to the limited funds available for bridge financing, interim activities should be limited to about 37 municipios, although some of those currently participating in the Project may be replaced by others.

The follow-on project should deal with the second-generation problems created precisely by the success of the present project and stress the elements upstream and downstream of the actual production process--marketing new products, improving credit recovery and production support through the testing/adaptation/validation of new technologies (e.g., seeds, cultivation practices, pest management). The follow-on project should not be a pilot project, but rather commercially oriented. Nutrition

education and 4-S youth clubs should become part of a different project and not receive further support from the follow-on effort.

B. Institutional Structure

COREDA should be recognized as the highest regional authority for the Project--CORECO should not be reactivated as a separate entity concerned only with the diversification project. COREDA meetings on project matters can be limited to participating institutions and other relevant parties, as is now the case.

COSUREDAS should be strengthened through higher-level support to assure coordinated implementation of diversification activities at the subregional level.

An URPA (USPADA regional agricultural planning unit) should be established in Region I. It will function as the secretariat for COREDA, responsible for coordinating all agricultural planning, programming, budgeting and monitoring activities in Region I, including all those concerning diversification efforts.

UCPRODA should remain a project-specific unit that is strictly responsible for facilitating administrative and financial matters concerning AID-assisted diversification activities, since planning activities will be relegated to URPA. UCPRODA personnel should be evaluated to assure that they can meet AID requirements.

Marketing should be recognized as the key element of diversification and the public sector's role clearly defined. Notwithstanding other larger scale market development activities that may be undertaken in the highlands (e.g., export outlets, purchasing centers, agro-industries), the diversification project must have its own basic grass-roots marketing activities (price information, organization of producers' groups, production scheduling), which are supported by technical assistance, to assure timely market outlets for increased production generated by the Project.

INDECA must become a participating agency in the Project as soon as possible and be recognized as the designated GOG regional authority for assisting with product marketing. The most appropriate functions for INDECA are gathering market information, organizing producers for marketing, and monitoring grading and standards. It should refrain from attempts to set prices for perishable products.

CORSEPE should act as a regional committee for coordinating produce marketing (similar to existing interinstitutional teams

for vegetable, fruit and livestock production), but in no case as an implementing agency with its own personnel, budget and logistics. CORSEPE should include a private-sector representative (Gremial de Exportadores) and preferably be chaired by INDECA, which is the mandated institution for agricultural marketing.

Interinstitutional subject-matter teams for vegetables, fruit trees and animal production should be given more authority for planning and coordinating the implementation of annual programs in their respective areas.

C. Research and Technology Adaptation

ICTA's FSR/E approach should be accorded a place appropriate to project and sector needs, and ICTA given a corresponding position in the Project.

Technology validation and testing should receive adequate funding.

The development of diversified complexes for fruit, vegetable and livestock production should be formally abandoned and research focused on changes that can be introduced one or two at a time.

Integrated pest management, rather than variety trials, should be the focus of vegetable research. ICTA should build a strong capacity in this area, including phyto-sanitation.

The socioeconomic aspect of ICTA's research in Region I should be strengthened by employing a person skilled in sociocultural and basic farm-level economic analysis.

Livestock research should concentrate on small animals rather than bovines.

Research on postharvest storage of fruits and vegetables should be strengthened as well as work on controlling product quality.

All on-farm trials in the region should be coordinated and monitored by ICTA.

D. Surveys

Large farm surveys that aim to assess project impact on the entire farm situation using a statistically significant sample should be abandoned in favor of:

- rapid-assessment sondeos (with ICTA fully in charge) which are geared to detect trends and provide tentative orientations for field research; and
- assistance with periodic surveys of the National Statistics Institute or USPADA's Statistics Unit (e.g., broadening the sample frame in the project area) to quantify the project's overall impact.

E. Research/Extension Linkages

The Project should follow the PROGETTAPS model for establishing research/extension linkages. The present situation in Region I is propitious for establishing such linkages.

On-farm validation and testing of vegetable species and varieties should be conducted mostly by DIGESA under ICTA's supervision.

ICTA and DIGESA should meet regularly on program direction to coordinate their activities.

F. Extension and Technology Transfer

Diversification on individual farms should be de-emphasized in favor of diversification among communities--i.e., promoting "vocational areas" specializing in different nontraditional products. The latter approach, which is already being used spontaneously, is congruent with local cultural norms, places less of a burden on farmers' management capacity, and offers economies of scale in extension and marketing efforts.

DIGESA should concentrate its efforts on training guías agrícolas and representantes agropecuarios, and their supervision by extension agents.

The safe use of pesticides should be emphasized in extension messages, and training and extension programs developed and related to better marketability of products in order to motivate producers.

Radio programs in indigenous languages should be used more widely, especially to alert farmers to the dangers of pesticides, need for soil conservation and economic incentives for following recommended practices.

DIGESEPE should continue to redesign livestock units to make them more commercially viable and focus more on women in indigenous areas, where small animals are tended mostly by women.

This might be accomplished by employing, with DIGESA, more female representantes agropecuarios.

The home economics and 4-S clubs component of the Project, managed by DIGESEPE, should be discontinued and made the subject of a different, well-focused project. The diversification project should concentrate on production and marketing.

G. Credit

In Region I, BANDESA should receive significant GOG personnel and logistic support (vehicles, computers, office equipment) to assure recovery of present diversification credits and the continuation of diversification loans.

More flexibility should be given to regional credit officials to shift credit funds among categories (e.g., vegetables, fruits) so that credit resources can be allocated to items which are in greatest demand. The credit limit for any category should be viewed as a guideline rather than an immutable target. The trust fund agreement should be prepared in close consultation between AID and BANDESA.

Credit targets should stress quality (recovery rates) rather than the number and amount of loans. The number of new clients should be limited by what BANDESA staff can effectively handle.

The loan process should be streamlined and credit applications simplified. BANDESA and the extension agencies should integrate their credit criteria more closely and cooperate in systematic monitoring of credit beneficiaries.

The recommendations of the credit study regarding the treatment of delinquent loans should be implemented.

Consultants' fees for planning mini-irrigation systems, providing veterinary care, etc., should be eligible credit subjects in order to encourage private agricultural consulting services, decrease the demands on DIGESA and DIGESEPE, and improve timely services to farmers.

Mini-irrigation credits and soil conservation payments could be shifted, at least during the bridge-financing period, to Loan 520-T-037 if the financial resources of the diversification project are insufficient. This recommendation should be examined in the upcoming evaluation of Loan 520-T-037.

H. Marketing

A policy statement on the public sector's role in marketing perishable products, clearly defining the responsibilities of each institution, is urgently needed. The public sector should not engage in the actual moving and trading of produce. Roles should be assigned judiciously, starting small and adapting objectives to available resources.

INDECA's structure and legal base cannot be ignored when determining the public sector's role in marketing--this would only create a competing agency. INDECA's functions in produce marketing should be defined by MAGA and limited initially to market information, the organization and training of producer groups, and quality control. These activities could be initiated on a limited basis at the national level (possibly by contracting out the actual gathering of information), and simultaneously on a pilot basis in Region I with appropriate connections to market destinations, by providing logistic support and training for INDECA's existing personnel. In Region I, INDECA should receive technical assistance from the current marketing advisor or a short-term agricultural information expert on setting up a market information system.

DIGESA's priority roles in produce marketing should be production forecasting, recommending marketable varieties, phasing planting to avoid market gluts and promoting on-farm storage (e.g., for apples and potatoes).

BANDESA should extend credits to the private sector for creating marketing infrastructure, thus avoiding the need for the public sector to finance and manage such structures.

I. Technical Assistance

Technical advisors for any future diversification activities should be attached to specific regional agricultural authorities. Advisors' scopes of work should include participation in relevant interinstitutional disciplinary groups to promote coordination at the technical level.

Scopes of work for all technical advisors should be worked out with the full participation of COREDA, as should the selection of advisors.

Expatriate technical assistance should be oriented more toward short-term assignments that focus on specific technologies or problems. In order of priority, the recommended long-term (two-year) positions are a marketing advisor and an expert in integrated pest management. The marketing advisor should be attached to INDECA and the pest management expert to ICTA. The

continued need for long-term expatriate fruit and livestock advisors should be reviewed. Under the proposed setup, there would be no need for a full-time technical assistance team leader. Short-term assistance topics that can be foreseen at this time are goats and other small animals, animal epidemiology, fruit quality and conservation, simplification of loan procedures (which would require a credit specialist) and assessment of the potential for agro-industries in Region I.

Assistance in export marketing should be located in Guatemala City and serve all exports of agricultural products from the country's various regions. This does not preclude the need for technical assistance in agricultural marketing from Region I, which is focused mostly on the domestic market.

The contracting mechanism for future technical assistance during the bridge-financing period could be an extension of the present USDA contract. However, for technical assistance to the follow-on project, there is no convincing reason for not using the normal procedure of open, competitive bidding.

The shift from the present EAT setup to the mode of technical assistance proposed here should be implemented to ensure that the disruption of ongoing activities is minimized. On COREDA's request, certain contracts could be prolonged on a short-term basis into 1988 to assure a smooth transition.

J. Training

A master plan for training should be prepared once basic decisions are made concerning the nature of the technical assistance and mechanisms to link research and extension.

If the PROGETTAPS type of research/extension linkage is adopted by the Project, as recommended by this evaluation, ICTA, DIGESA and DIGESEPE technicians should be trained in the FSR/E methodology as well as how to communicate effectively in the rural milieu.

Other short-term training should be made available according to the stated needs of the national institutions.

Long-term training abroad should continue under the proposed bridge financing. This should include ICTA (especially in integrated pest management), but also other agencies--e.g., DIGESA in extension methodology and mass communications, and INDECA in agricultural marketing.

K. Administration

Each participating agency should assign officials to be specifically responsible for project administration. These individuals, as well as administrative directors at the regional and central levels, should receive training in GOG and AID financial and administrative procedures. This training should be given jointly to officials of the different agencies (e.g., implementing agencies, USPADA, Ministry of Finance).

Quarterly progress reports should be streamlined into an effective project management instrument.

For "leapfrog" advances of operating funds, MAGA and AID should negotiate an arrangement with the Global Revolving Fund whereby each operating agency would be authorized to draw budget advances for a second quarter before reimbursing first-quarter advances, but would be eligible to receive advances for the third quarter only after it has reimbursed all first-quarter advances (with MAGA or AID funds). In this way, the flow of operating funds will not be interrupted. The National Treasury has indicated a willingness to discuss this procedure.

To further facilitate disbursements of AID funds, AID should establish a project bank account to be managed by UCPRODA. The operating agencies would submit pro forma invoices to UCPRODA for purchases to be made with AID funds (with a copy to the Ministry of Finance). After review and approval by the Vice-Minister of Agriculture, UCPRODA would issue a check in favor of the supplier. AID would replenish the account whenever it was drawn down to a certain point.

The discretionary budget line managed by EAT was a key feature in permitting agile project responses to felt needs (about \$100,000 was used for seed importation, etc.). The follow-on project should include a similar feature.

Whenever practical, equipment purchases should be made from national suppliers to accelerate delivery and assure better service. Such purchases should be programmed to conform to legal restrictions on local purchases.

The installation of computers in the Region I offices of BANDESA, DIGESA, ICTA and INDECA (with modem connections to their national headquarters), and possibly UCPRODA and URPA, should be given priority to facilitate financial management, improve loan monitoring, and process agricultural and marketing cost data. A needs assessment should be done of necessary hardware and software, and appropriate training provided.