

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

IDENTIFICATION DATA

A. REPORTING A.I.D. UNIT: USAID/Guatemala _____ (Mission or AID/W Office) (ES# 88-11)	B. WAS EVALUATION SCHEDULED IN CURRENT FY ANNUAL EVALUATION PLAN? yes <input checked="" type="checkbox"/> slipped <input type="checkbox"/> ad hoc <input type="checkbox"/> Eval. Plan Submission Date: FY <u>88</u> Q <u>2</u>	C. EVALUATION TIMING Interim <input checked="" type="checkbox"/> final <input type="checkbox"/> ex post <input type="checkbox"/> other <input type="checkbox"/>			
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)
520-0274	Highlands Agricultural Development Project	9/30/83	9/30/90	9,185.5	9,185.5

ACTIONS

E. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR	Name of officer responsible for Action	Date Action to be Completed
Action(s) Required		
1. Develop new Project Amendment, incorporating both Small Farmer Diversification Systems Project (0255) and HADS (0274).	ORD, T. Ivers	3/31/88
2. Create a simplified administrative structure which is responsive to new project needs.	ORD, T. Ivers PDSO, R. Steelman	3/31/88
3. Improve USAID management by creating one Project Manager position for the new project.	Mission Mgmt.	3/31/88
4. Develop a financial system which is more streamlined and which meets the needs of the GOG and USAID.	CONT, J. Hill ORD, T. Ivers	5/31/88
5. Make decision regarding whether rural roads access maintenance component should remain in amended Project, and, if so, in what form.	Mission Mgmt.	3/31/88
6. Create a system within the executing agency for priority planning; baseline studies; follow-up and evaluation.	GOG ORD, T. Ivers	5/31/88

(Attach extra sheet if necessary)

APPROVALS

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

G. APPROVALS OF EVALUATION SUMMARY AND ACTION DECISIONS:

Project/Program Officer _____ Signature Typed Name Ing. Mario Aragón Date: <u>5/3/88</u>	Representative of Borrower/Grantee _____ Signature Typed Name Lic. Gaspar Leal Date: <u>5/11/88</u>	Evaluation Officer _____ Signature Typed Name Tom Kellerman Date: <u>5/11/88</u>	Mission or AID/W Office Director _____ Signature Typed Name Anthony J. Gaucherucci Date: <u>5/11/88</u>
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Continuation

E. Action Decisions

- | | | |
|--|------------------------------------|---------|
| 7. Assist BANDESA in reviewing recuperation rate, commission structure and economic analyses and develop a more efficient and uniform system of reviewing and monitoring loans. | ORD, B. Lennon | 6/15/88 |
| 8. Develop practical training manuals and courses for both DIGESA technicians and farmers stressing agronomic and soil conservation practices and irrigation system maintenance. | ORD, T. Ivers
DIGESA | 7/31/88 |
| 9. Establish a marketing mechanism under the Project Amendment or in conjunction with the Agribusiness Development Project which provides information and technical assistance to farmers. | ORD, T. Ivers
INDECA
Gremial | 7/31/88 |
| 10. Review water resources in areas selected for attention under the Project Amendment and select priority areas, taking into account watershed management concerns. | ORD, T. Ivers | 7/31/88 |

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assist

the Government of Guatemala (GOG) to provide infrastructure in the Highlands of Guatemala. The Project is divided into two components: 1) natural resources, which includes small-scale irrigation, soil conservation and forestry; and 2) rural access roads maintenance. The Project is implemented by the Ministry of Agriculture, Livestock and Food (MAGA). This mid-term evaluation (October 26-November 20, 1987), was conducted by a three person team from Associates in Rural Development, Inc. on the basis of a review of Project documents, visits to five of the six MAGA project regions, and interviews with farmers and both USAID and host country counterpart Project personnel. The evaluation involved only the natural resources component. The purpose of the evaluation was to improve Project implementation, as well as strengthen the institutional capacity of the implementing agencies. The major findings and accomplishments are:

- * Generally speaking, the technical interventions under the Project are sound and well accepted by the beneficiaries.
- * While appropriate baseline data are not available, information extrapolated from studies of target groups under similar activities show that productivity and incomes have increased significantly.
- * Although the Project's execution level, in terms of U.S. dollar resources expended in relation to time elapsed, has been below expectations, this is partly the result of devaluation of the Quetzal which made a considerable additional amount of local currency available for project activities and thus, reduced the rate of U.S. dollar expenditures for local project costs.
- * Deficiencies have been noted in Project management on the part of both the GOG and USAID. The Project suffers from a fragmented managerial approach, overlapping authority on the part of GOG institutions, inability to set priorities and insufficient baseline data, inter alia.

The evaluation suggested the following "lessons":

- * There is a need for administrative simplification in Project management in order to avoid overlapping jurisdiction and confusion.
- * The host country executing agency should have the capacity or should be trained to establish priorities, conduct (or contact for) baseline studies, develop follow-up mechanisms and evaluate activities.
- * There should be only one USAID Project Manager for a given project.
- * The design of future projects should emphasize the integration of all components, e.g. production, watershed management, credit, marketing, etc.
- * A marketing component should accompany a production-oriented project, and production planning should start from the final market and work back.
- * The technological interventions have been appropriate and appear to have led to significantly higher income for the recipients. However, follow-up studies need to be conducted to determine whether or not this is a permanent condition.

L EVALUATION COSTS

1. Evaluation Team Name	Affiliation	Contract Number <u>OR</u> TDY Person Days	Contract Cost <u>OR</u> TDY Cost (US\$)	Source of Funds
James Jones,	ARD, Inc.	PDC-1406-1-01-7012-00	\$92,590.01	PD&S
George Wohanka	ARD, Inc.		Total	
Paul Dulin	ARD, Inc.			

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

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

b

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: USAID/Guatemala Date this summary prepared: February 15, 1988
 Title and Date of Full Evaluation Report: Guatemala Highlands Agricultural Development Project
Midterm Evaluation, December 18, 1987.

1. Purpose of Activities Evaluated: Only one component of the Project was evaluated, i.e. natural resources, which consists of a pilot reforestation program (to be reviewed separately) and construction of small-scale irrigation and soil conservation systems. The other major component, road maintenance, was not addressed, as it has been administered as a separate activity. The purpose of the natural resources component is to increase productivity and income of small farmers in the Guatemalan Highlands, while sustaining and enhancing the resource base.

2. Purpose of Evaluation and Methodology Used: This mid-term evaluation was designed to make corrections to Project design, as well as improve technical and administrative institutional proficiency.

A team of three expatriate specialists in the areas of development economics, natural resources and agricultural credit were contracted to perform the evaluation during the period October 26 - November 20, 1987. With the exception of the credit specialist, who spent only two weeks in-country, the remaining team members were in Guatemala for the duration. It was originally envisaged that two Guatemalan team members would be hired to assist the team, but due to delays in the contracting process, these consultants were not hired.

The team visited five of the six Project regions (there has been no activity in one region to date) and met with at least 20 farmers. The team also reviewed relevant materials and visited technical and administrative personnel in the central offices of the executing agencies in Guatemala City.

3. Findings and Conclusions: With respect to technical interventions, the team found that the activities were sound, both from a technical and socioeconomic point of view. The soil conservation technologies and small scale irrigation are well accepted and appropriate to the Highland regions.

The Project has met with limited success during the three and a half years of implementation. The level of execution has been lower than expected by USAID and the GOG, partly due to: 1) the devaluation of the Quetzal, which provided a considerably higher level of local currency resources than originally planned; and 2) deficiencies in managerial and administrative, as well as technical, areas, which have affected the extent and quality of the Project's outreach.

The full findings and conclusions, as well as general recommendations, of the evaluation are attached as Annex I. The principal findings are discussed below in context with the Scope of Work:

A. Project Goals and Purposes: Evaluate adherence to Project Paper objectives, mechanism for setting priorities and quantify stated measurements or indicators to the extent possible.

Goal: To increase agricultural productivity.

Purpose: To improve the productive resource base of the rural poor in the Highlands.

Findings: The team found that the execution of the Project was not faring badly with respect to the relationship of time elapsed to funds expended, if the effects of devaluation were considered. While no baseline studies were included in the design of the Project, through extrapolation of available data it was concluded that "... the incomes of beneficiaries of soil conservation works and irrigation systems do indeed rise faster than and exceed the incomes of non-beneficiaries. The findings also support the conclusion that soil conservation and irrigation lead to at least a 50 percent increase in agricultural production." It can, therefore, be concluded that the Project is generally meeting the goals and purposes established in the design.

With respect to the setting of priorities, it was found that there was duplication of objectives, confusion within the Ministry of Agriculture, causing mixed authority and responsibility of project execution, and a lack of an integrated work plan among Project components, i.e. roads, forestry and soil conservation/mini-irrigation. The evaluation team recommended that a planning, monitoring and evaluation system be established.

As stated on page 17 of the evaluation, no appropriate baseline survey data were available to measure against. The team used other information available and extrapolated data in order to arrive at estimates of production and income increases.

B. Project Outputs: Review all outputs in relation to project design with special impact on beneficiaries. Include changes in income, production and yields; improvements in farmer proficiency to manage irrigation and other infrastructure, and use of improved technology and inputs.

Findings: The HADS Project Paper estimated a 50 percent increase in agricultural production as a result of the Project interventions. A review by the Evaluation Team of the available studies to date supports the conclusion that the Project activities lead to at least a 50 percent increase in production. With respect to incomes, the authors noted that, while some studies found striking gains, i.e. 400-900 percent in the case of irrigation with non-traditional crops, income gains are based on viable markets for non-traditional crops and a certain level of technical assistance to produce them. Shifting market conditions and a lack of market information make it difficult to measure this aspect, especially in the absence of a marketing component and strategy.

Acceptance of the mini-irrigation technology has generally been no problem, as farmers are aware of the potential benefits. It was found that the majority of small-scale irrigation schemes were well designed and simple in nature. They were well constructed and were operating as expected. Farmers participate in the construction of the systems, and are trained to an extent in maintenance. However, the evaluation noted that there has been a lack of appropriate training of DIGESA extensionists in specific technical areas, as well as irrigation maintenance.

J. Summary of Evaluation Findings

There also has been a lack of follow-up extension activities, both with respect to agronomic aspects, as well as irrigation system maintenance.

C. Project Management: Assess GOG institutional management capabilities and ability to orchestrate multi-faceted technical components as well as USAID support to the effort.

Findings: Due to the multiplicity of agencies and coordinating bodies under the Ministry of Agriculture, as well as the regional nature of the Project, there are inherent inefficiencies in Project management. This has created overlapping and mixed authority and responsibility for Project execution, and, as a result, has diminished GOG ability to coordinate and manage the Project. Also, the lack of an integrated operational work plan has resulted in a less than efficient operational situation. Further, a lack of coordination within the Ministry of Finance has resulted in the authorization of less funds than amounts budgeted under the Project.

With respect to USAID support, it was found that there were essentially three Project managers, i.e. one for each component, and that the roads activities were virtually completely divorced from the other two. It also was noted that Project Implementation Letters were often delayed, that procurement of vehicles was slow and that technical assistance had not been provided, although funds were available.

D. DIGESA Management and Planning: Assess DIGESA's mechanisms for organizing, planning and implementing activities as well as setting priorities, promotion and organization of farmer beneficiaries.

Findings: As mentioned in 3 A., above, the multiplicity of agencies and coordinating mechanisms within the Ministry of Agriculture leads to a confusing situation with respect to planning and implementing the Project. As a result, priorities have not always been set, and beneficiaries have often been selected arbitrarily. Promotion and organization of farmers has been good, but DIGESA has not always provided follow-up assistance. Staffing in the various regions has not always been in proportion to the level of activities.

E. BANDESA Policies and Implementation: Review overall credit policies and procedures, inter-relationships with DIGESA, and follow-up methods for credit use and repayment.

Findings: Field offices of BANDESA have been quite responsive to credit requests, and BANDESA has adhered closely to the terms of its agreements with DIGESA. Policies established have been appropriate. However, BANDESA's poor recuperation rate, illiquid financial situation and variation in economic analyses justifying irrigation projects, have negatively affected the Project to some extent.

F. Lessons Learned: Describe insights gained to date that will improve future operations with emphasis on technological approaches, relevance to client groups, long-term implications to small farmer land values, host country management techniques, and institutional wills and capacities to sustain these activities.

1. There needs to be a clarification of roles within the various Ministry of Agriculture administrative and implementing agencies and coordinating bodies, and administrative simplicity should be of paramount importance.

2. The principal executing body should either have the capacity or should be trained to establish priorities, develop (or contract for) baseline studies, establish appropriate follow-up activities and measure Project progress against baseline information.

3. USAID should not allow the proliferation of Project management. The Project should have but one Project Manager, and, if there is a divergence of activities, in this case the rural roads component, the component should be placed in another project.

4. The design of future projects should emphasize the integration of similar components, e.g. credit, production, marketing, etc. in order to avoid proliferation and confusion of purpose.

5. A marketing component should be built into any production-oriented project, especially one which involves a heavy individual debt, such as mini-irrigation. Ideally, planning should start from the market linkages and work backward, in order to decide what crops to plant, when they are to be planted and what quantities are to be produced.

4301R



one was submitted earlier)

all

EVALUATION REPORT

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 arrive at valid conclusions and recommendations. The Mission and the implementing organizations concur with the accuracy of the evaluation and are committed to implementing the recommendations.

MISSION COMMENTS ON FULL REPORT

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GUATEMALA HIGHLANDS AGRICULTURAL DEVELOPMENT
PROJECT -- MIDTERM EVALUATION

Prepared by:

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Under AID contract number PDC-1406-I-01-7012-00.

Date: 18 December 1987

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ABBREVIATIONS

AID	U.S. Agency for International Development
ARD	Associates in Rural Development, Inc.
BANDESA	Banco Nacional de Desarrollo Agrícola (National Agricultural Development Bank), bank handling almost all financing of small farmers
CECOMERCA	Central Cooperativa de Mercadeo
CORECO	Comité Regional de Coordinación (Regional Coordination Committee), specifically for Project 520-0255, consisting only of the agencies involved--BANDESA, DIGESA, DIGESEPE and ICTA
COREDA	Comité Regional de Desarrollo Agrícola (Regional Committee for Agricultural Development), supreme representative of MAGA in any region, consisting of the regional heads of all MAGA agencies--BANDESA, DIGESA, DIGESEPE, ICTA, INDECA and INAFOR
CORSEPE	Comité Regional Sectoral de Producción para la Exportación (Regional Sectoral Committee of Production for Export), composed of representatives from BANDESA, DIGESA, DIGESEPE, ICTA, INDECA, INAFOR and INACOP
COSUCO	Comisión Superior de Coordinación (Superior Coordinating Commission), composed of the heads of all MAGA General Directorates and Institutes
COSUREDA	Comité Sub-Regional de Desarrollo Agrícola (Subregional Committee for Agricultural Development), composed of subregional directors of agencies comprising COREDA
DCR	Dirección de Caminos Rurales (Directorate of Rural Roads)
DIGESA	Dirección General de Servicios Agrícolas (General Directorate of Agricultural Services), responsible for all crop extension activities
DIGESEPE	Dirección General de Servicios Pecuarios (General Directorate of Livestock Services), responsible for all animal health and production extension activities
EAT	Equipo de Asistencia Técnica (Technical Assistance Team), provided by USDA for Project 520-0255 under an AID contract

GOG Government of Guatemala

HADS Highlands Agricultural Development Project

ICTA Instituto de Ciencia y Tecnologia Agricola (Institute of Agricultural Science and Technology)

IDB Inter-American Development Bank

IFPRI International Food Policy Research Institute

INACOP Instituto Nacional de Cooperativismo (National Institute for Cooperatives)

INAFOR Instituto Nacional Forestal (National Forestry 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

IRR internal rate of return

MAGA Ministerio de Agricultura, Ganadería y Alimentación (Ministry of Agriculture, Livestock and Food)

ORD Office of Rural Development, USAID

PACD project assistance completion date

PP project paper

ProAg project agreement

PROGETTAPS 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

ROCAP Regional Office for Central America and Panama, USAID

UCPC Unidad Coordinadora de Proyectos y Convenios (Coordinating Unit for Projects and Agreements)

UCPRODA Unidad de Coordinación para el Proyecto de
Diversificación Agrícola (Coordination Unit for Project
520-0255)

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

USAC University of San Carlos

USAID U.S. Agency for International Development

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 mid-term evaluation of the Highlands Agricultural Development Project (AID project number 520-0274, loan T-037). ARD's evaluation team--Dr. James Jones (Team Leader and Development Economist), George Wohanka (Credit Specialist) and Paul Dulin (Natural Resources Specialist)--was in Guatemala from 26 October to 20 November 1987. The evaluation team wishes to express its thanks to all the Guatemalan and USAID officials involved in this evaluation effort, especially the dedicated DIGESA and BANDESA staff in the offices of Regions I, II, V, VI and VII, and in the central offices in Guatemala City. Mr. Dulin took the photographs reproduced in this report.

EXECUTIVE SUMMARY

The Highlands Agricultural Development Project (HADS) is an infrastructure initiative with the goal of increasing agricultural productivity and the purpose of improving the productive resource base of the rural poor. The project agreement (ProAg) was signed on 30 September 1983 between the United States Agency for International Development (USAID) and the Government of Guatemala (GOG), in its authority of the Ministry of Agriculture, Livestock and Food (MAGA). Subsequent amendments in 1985 and 1986 added US\$6.0 million to bring the total loan agreement to US\$13.5 million, and US\$600,000 to bring the grant amendment to a total of US\$2.1 million. The current Project Assistance Completion Date (PACD) is 30 September 1990.

The project is divided into two major components:

1) natural resources, which consists of subcomponents in small-scale irrigation, soil conservation and forestry; and 2) a rural access roads maintenance program. The small-scale irrigation and soil conservation subcomponents are currently being implemented through MAGA's Dirección General de Servicios Agrícolas (DIGESA) in Regions I, II, IV, V, VI and VII (see Figure 1); while credit services for disbursing irrigation infrastructure loans and social payments for soil conservation are being provided by the Banco Nacional de Desarrollo Agrícola (BANDESA). The forestry component, including activities of reforestation and forest management, is being carried out through the Instituto Nacional Forestal (INAFOR). The access roads maintenance component is managed by the Dirección de Caminos Rurales (DCR) in areas coinciding with portions of MAGA's Regions I, V, VI and VII.

HADS is consistent with USAID's policy of increasing foreign exchange in an effort to improve the balance of payments of Guatemala as well as with its focus of improving conditions of rural poor, improving economic and political stabilization, long-term growth and the equitable distribution of economic benefits. The present mid-term evaluation deals in depth only with the natural resources subcomponents of small-scale irrigation and soil conservation (with its complementary credit/social payments component). While the forestry and roads components are not fully treated in this evaluation, their relation to the irrigation and soil conservation efforts are discussed. The evaluation was carried out by three expatriate consultants--a development economist, a credit specialist and a natural resources specialist--during a four-week period from 26 October to 20 November 1987 and consisted of field visits to all participating MAGA regions currently participating in the project, as well as discussions at the central-office level in Guatemala City.

By and large, the interventions being promoted by DIGESA under HADS are sound, both from technical and socioeconomic

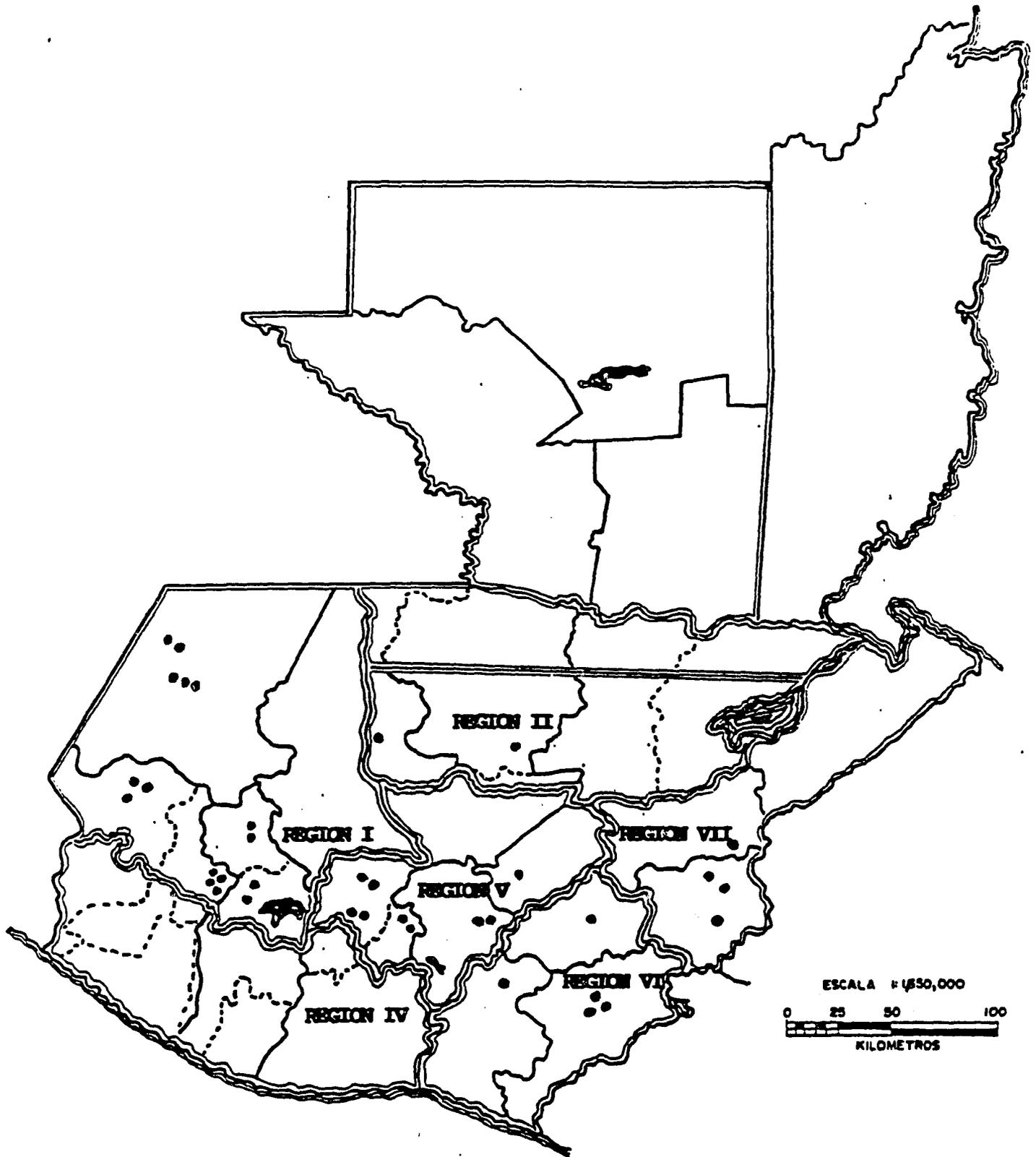


Figure 1. MAGA Regions Participating in HADS Project
(with location shown of mini-riego projects)

viewpoints. The effectiveness of soil-conserving technologies such as terraces and rock walls is borne out by their historic and continued use by the Mayans from the first century A.D. up to their descendants throughout much of Guatemala in the 20th century. Small-scale irrigation has enjoyed a high rate of success in Guatemala, being traditional in many altiplano river valleys where gravity-fed flood irrigation has long been used. More efficient gravity-fed aspersion systems have gained popularity with such projects as the AID-supported Small Farmer Development and Small Farmer Diversification Systems projects beginning in 1978.

Although the project has met with limited success in its first three-and-half years, its execution level has been somewhat below that expected by USAID and GOG. While this lower level of execution can be explained, in part, by the unstable economy of Guatemala and the devaluation of the quetzal (Q), the evaluation team detected various deficiencies in both managerial and administrative as well as technical aspects of implementation which have, thus, affected the extent and quality of the project's outreach. Many of these deficiencies have been examined and analyzed by USAID project management in conference with personnel of DIGESA and BANDESA--the results of which have been assimilated in a draft amendment to the ProAg (the fourth) which is currently pending before USAID.

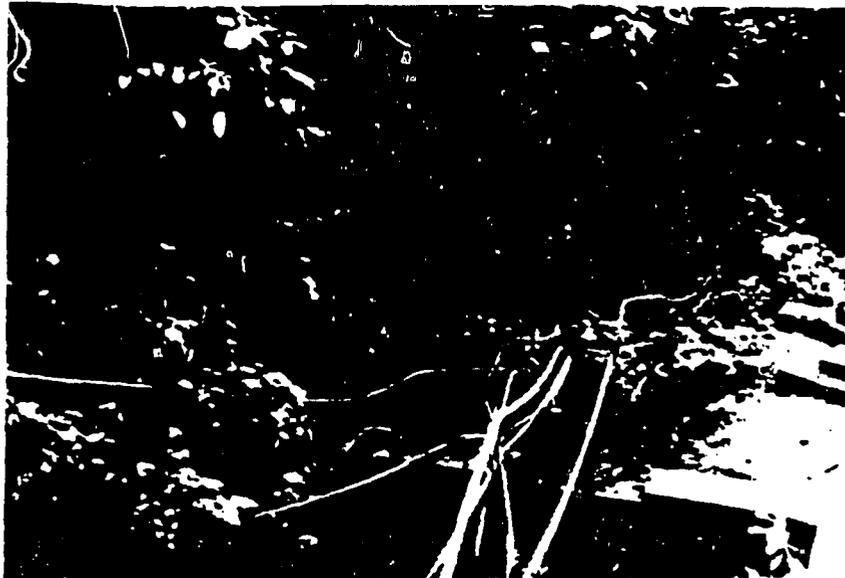
For simplicity, the deficiencies detected by the evaluation team are summarized in matrix form on the following pages. For these deficiencies, several causes are cited, along with the evaluation team's recommendations on how the discrepancies should be addressed in order to bring HADS in line with a more efficient and responsive development effort. Details of each deficiency and their causes, as well as a more substantive discussion of the recommendations suggested for their resolution, are discussed throughout this evaluation report.



Villages such as Almolonga in the altiplano (DIGESA, Region I) have relied on irrigation by traditional run-of-the-river diversion schemes and cistern-bucket systems in order to improve production and on-farm incomes.



HADS seeks to combine the efficiency of simple diversion, small-scale gravity-fed piped irrigation systems with soil conserving land treatments such as this one in Las Cebollas in DIGESA's Region VII.



The importance of gravity-fed piped irrigation systems can be easily discerned on a visit to a diversion above Zunil in DIGESA's Region I. There are no less than 25 polyurethane conduits, each representing a different small-scale irrigation project--all of which were operating before the inception of HADS.



Soil conservation is not dependent on small-scale irrigation. Here, near the divide just east of Quezaltenango, steeply sloping land is being converted to bench terraces to enhance production under traditional rainfed crops.

ORGANIZATIONAL STRUCTURE, MANAGEMENT AND COORDINATION

PROJECT DEFICIENCY	CAUSE	SOLUTION/RECOMMENDATION
1. Confusion/competition between funds allocated to different, but, in most cases, identical projects.	1.a. Duplicity of objectives, design, outreach areas, executing agencies and beneficiaries in HADS, Small Farmer Diversification Systems and PL 480-84.	1.x. All monies destined to finance activities in soil conservation, mini-riego, credit and related follow-up extension should be combined into one project.
2. Confusion over hierarchical structure in MAGA/DIGESA; inefficient top-down sectoral approach of technical assistance to farmers.	2.a. HADS suffers, especially at sub-regional and extension agency levels, from overlapping and mixed authority and responsibility of project execution.	2.w. The organization and operation of this project (1.x. above) should be based on a clear hierarchy of simplistic design, avoiding duplication of roles and responsibilities. Authority of execution should be decentralized as much as possible, giving more autonomy to the lower levels of execution (sub-region, extension agency).
n	2.b. Sectoral division of MAGA (DIGESA, DIGESEPE, ICTA, INAFOR, COSUREDA, URPA, PROGETTAPS) which confounds efforts of extension agency to give assistance to farmers.	2.x. Consolidate subdivisions of MAGA at the agency level into one functioning team with a clear hierarchy and limited autonomy to carry out integrated programs.
	2.c. Lack of an integrated operational work plan developed for extension agencies and their work areas; HADS parachutes into areas sectorally. Tendency to operate out of the regional offices, which is costly in time, logistics, and gasoline.	2.y. Create a simplistic planning, monitoring and evaluation system appropriate to the extension-agency that, in turn, fulfills the priorities of subregional and regional authorities (bottom-up). Decentralize operations as much as possible to sub-regions and especially to agencies.
3. Weak and irresponsive financial management by USAID and OOG has resulted in inordinate delays in project execution; a surplus of funds and lethargic implementation levels, leading to a large "pipeline" of funds.	3.a. Within the Ministry of Finance, there has been a lack of coordination between the Dirección Técnica del Presupuesto and the Oficina de Coordinación de Financiamiento Externo. The Dirección Técnica has (with the exception of this year's budget) authorized less than the amounts budgeted for operations of the project, thus retarding project implementation.	3.v. A full-time Guatemalan financial specialist should be contracted with reprogrammed grant funds. Beyond experience in administrative and financial systems, S/He should be skilled in the analysis of bureaucratic policies and procedures, and so be able to suggest ways to make transactions within and across institutions more efficient. S/He would be charged with troubleshooting problems and finding solutions.

- 3.b. The USAID fiscal year, beginning Oct. 1, is out of phase with the GOG fiscal year, beginning Jan. 1. The loan funds of Amendment Three, for example, approved in September of 1986, could not be used in 1987 because GOG budgets for 1987 had to be submitted to the Ministry of Finance in April of 1986. They were included in the 1988 budget and will be available in January. Since the funds were to expand project operations into Region Iv, the project has not yet been active there.
- 3.c. The GOG Revolving Fund will not disburse funds to an institution until the previous disbursement to that institution has been liquidated. USAID has been slow —up to nine months— to reimburse the Revolving Fund. USAID delays in processing vouchers issued by spending institutions; and USAID delays in transferring money from its accounts in Mexico. This problem was alleviated somewhat in September of this year, when the Ministry of Finance agreed to disburse further funds on the strength of copies of vouchers received by USAID.
- 3.d. USAID too often delays in the preparation of Project Implementation Letters. Among other things, these letters release the national budgets for participating institutions.
- 3.e. USAID procurement of vehicles has been slow; no vehicle has been received by DIGESA within a year of its requisition.
- 3.f. The devaluation and loss of confidence in the Quetzal resulted in a surplus of dollars since fewer dollars had to be converted to supply the budget obligations stipulated in the ProAg with GOG.
- 3.w. USAID should address weaknesses in its own procedures especially delays in the preparation of Project Implementation Letters and reimbursement.
- 3.x. A simple, project-specific manual should be prepared in Spanish detailing USAID policies, procedures, and requirements regarding the disbursement of project funds. The manual should be prepared for nationals interacting with USAID on behalf of their institutions in the context of this disbursement. Consideration should also be given to providing them with training in such matters, using the manual as a text.
- 3.y. USAID should try to purchase vehicles locally in Guatemala or through a procurement firm.
- 3.z. "Quetzalizar" the dollar amounts budgeted under the original ProAg and make these funds available to facilitate project funding at more realistic levels (2.5 Quetzal/Dollar). Much of these "additional" Quetzales could be used to finance many of the human and physical resources necessary to improve project operation (i.e., Amendment 4).

- * 4. Lack of concern for marketing issues.
 - 4.a. Original project design did not contemplate marketing as a component.
 - 4.b. Complaisance on part of AID project management and mission as a whole on concern of marketing as issue.
 - 4.x. Include a marketing component in any new project design which clearly defines roles and responsibilities to executing agencies (DIGESA, INTECA, CORSEPE).
 - 4.y. Execute a thorough study of potential domestic and international markets.
 - 4.z. Consider linkages with the Agribusiness Project.

- 5. Lack of technical assistance.
 - 5.a. Even though stipulated and budgeted in PP, technical assistance has not been by HADS.
 - 5.x. Utilize funds budgeted for technical assistance in accordance with stipulations in draft Amendment Four and this evaluation.

- * 6. The Forestry component, as currently managed, has little to do with the objective of the HADS mini-riego and soil conservation components.
 - 6.a. The original project design was deficient in specifying the location and activities which complement the other HADS components.
 - 6.b. AID project management was negligent in allowing the forest component to develop into an autonomous activity. The component is currently managed by a project manager different than that of other project components.
 - 6.x. The Forestry component should be integrated into HADS as a watershed management activity directed at conserving the forests in the tributary watersheds of the mini-irrigation projects; minimal funding should be assigned to INAFOR to carry out forest management, protection and consciousness-raising activities in these watershed areas.
 - 6.y. AID should assign this component to the same project officer for those activities mentioned in 6.x. Any other activities outside of these watersheds should be stripped from HADS and managed under another initiative.
 - 6.z. In areas where possible, selected trees and shrubs should be incorporated into agroforestry combination at the farm level and promoted by extensionists, guías and representantes.

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- * 7. The roads component in HADS has little or no relation with the location and activity under the mini-riego and/or soil conservation components.
 - 7.a. Caminos Rurales has developed its own agenda and selection criteria of the reconstruction and maintenance of road segments. DIGESA has not been consulted in the selection of priority segments to be rehabilitated. Caminos Rurales will not improve a segment which the institution did not originally build.
 - 7.b. AID project management has not insisted on Caminos Rurales adhering to the objectives and spirit of the HADS ProAg. Management of the roads component has been different project officer than ent.
 - 7.x. Caminos should develop criteria which include the locations of mini-riego projects and other areas where improved access is paramount to the successful marketing of small-farm agricultural production. DIGESA, as proxy, should represent the farmers in these locations.
 - 7.y. The roads component should be stripped from the HADS project and continued under a different development initiative. Collaboration of AID/ORD and DIGESA should directly influence the selection of priority rehabilitated.

DIGESA

PROJECT DEFICIENCY

1. Arbitrary selection of priority work sites and mediocre selection of project beneficiaries.

6

2. Inefficient follow-up extension on soil conservation and mini-irrigation projects.

CAUSE

1.a. Lack of a systematic approach to locate areas in need of watershed management and soil conservation, potential irrigation water sources and appropriate command areas.

1.b. Lack of knowledge of villages, farming systems type and agroecologic conditions within project area.

1.c. Absence of baseline information and a method for maintaining and analyzing it.

2.a. Lack of DIGESA human and logistical resources at the sub-regional and especially the agency and village levels.

2.b. Lack of appropriate training of DIGESA extensionists, guías and representantes in specific technical areas (horticulture, irrigation system operation and maintenance, etc.)

2.c. Lack of or inappropriate use of extension and promotion equipment and materials.

SOLUTION/RECOMMENDATION

1.x. Develop a simplistic mapbased system indicating priority areas for soil conservation, potentially available irrigation water resources and potential command water areas. This can be done in collaboration with the USAC program of Ejercicio Profesional Supervisado.

1.y. At the extension agency level (extensionists, guías, representantes), develop a system for characterizing each village, local agroecologic and socioeconomic parameters and local farming systems. Develop a needs assessment as a basis to technical assistance.

1.z. Develop a computerized information management system to process, analyze and maintain tabular information.

2.u. Investigate two alternatives to resolve this problem: 1) Organize agency (extensionists, guías, representantes) to respond to follow-up needs of projects and/or 2) Hire or reassign guías and representantes specifically to provide extension services to project beneficiaries.

2.v. Develop a series of task-specific training courses of purely practical orientation, which in turn will provide the basis for technically orienting farmers on their treated lands.

2.w. Incorporate proper use of materials as part of training in 2.v., not just send materials out to the agencies. Expand geographically the use of materials prepared by EAT, Superb, EEE, etc.

- 2.d. Arbitrary selection of "stock vegetables" without thought to local conditions, consumption patterns and preferences, markets and prices, experience of farmer.
- 2.e. Lack of agricultural inputs immediately available to farmers to apply to newly irrigated land (seed, fertilizer, pesticides).
- 2.f. Inexperience of farmers in irrigated and diversified agriculture (region specific).
- 3. Over-emphasis on bench terraces; lack of maintenance and failure to incorporate conservationist agronomic practices.
 - 3.a. Tradition of promoting bench terraces without regard to eventual use of land and consideration of labor costs.
 - 3.b. Lack of incorporating appropriate agronomic measures (alley cropping, organic fertilizers, contour furrowing, etc.) into soil conservation strategies.
- 4. Costly, inefficient staffing patterns at regional and sub-regional offices; inefficient use of existing human resources.
 - 4.a. Topographic teams in several regions are without work more time than with.
 - 4.b. The use of full-time masons is not needed in most regions.
 - 4.c. In some regions, farmers are not trained in repair and troubleshooting of irrigation systems, requiring technicians to do simple repairs and maintenance.
 - 4.d. Low level of requests for mini-irrigation in Region II because of locally favorable meteorologic conditions.
- 2.x. Based on characterization of agencies in 1.y., review criteria of selection and mix of appropriate crops to be produced on irrigated and/or soil conservation treated land.
- 2.y. Include an appropriate budget line in irrigation credit to supply inputs necessary for, at least, the first crop cycle. Promote farmers to use social payments for purchase of agricultural inputs.
- 2.z. As described in 2.v., ensure that farmers are trained and/or assisted during the critical first few cropping cycles.
- 3.x. Broaden selection criteria to consider hillside ditches green barriers, narrow terraces.
- 3.y. Promote system that interrelates mechanical conservation structures to agronomic measures as a package. Also promote alley cropping and agroforestry modules.
- 4.v. Hire private-sector topographic services on an as-needed basis.
- 4.x. Use local masons on an as-needed basis and/or train community members in masonry.
- 4.y. During construction, train one or more group members in troubleshooting of problems and simple repairs (PVC, mariposas), and provide minimum supplies and tools.
- 4.z. Remove mini-irrigation team from Region II and assign them where there services are needed.

BANDESA

PROJECT DEFICIENCY	CAUSE	SOLUTION/RECOMMENDATION	
1. Decapitalized and illiquid financial condition of BANDESA; inability to prefund loan monies and maintain human resources and equipment.	1.a. Lending rates are subsidized.	1.n. Recognize precarious position of BANDESA.	
	1.b. Poor loan recuperation rate.	1.o. Preferably change fideicomiso to allow 10% commission for collection of mini-riego loans and 3% on crop loans in addition to keeping interest.	
11	1.c. Inability to mobilize savings or use those savings captured for application to loan funds.	1.p. Pay commission of an extra 2% for making social payments.	
		1.q. Additional income should be used to purchase vehicles, computers, equipment, maintenance, etc.	
		1.r. Advance funds to BANDESA for loans and social payments instead of using reimbursement mode.	
		1.s. Raise interest rate to 12 or 14%.	
		1.t. Provide collection/on-time payment incentives to staff/farmers.	
		1.u. Reduce maximum term from 15 to 10 years; use even shorter term when obvious irrigated land will be placed in short-term crops.	
		1.v. Eliminate two-year grace period.	
	2. Inability to fully recuperate loans.	2.a. Pressure to lend to politicians, weak cooperatives and in areas of political violence—all with little hope or pressure to collect loans.	
		2.b. Old, outdated or unserviceable equipment and vehicles that make difficult loan supervision and collection.	2.x. AID should authorize purchase of sufficient vehicles and equipment, after needs assessment of all regions.

3. Discrepancies in the economic justification of irrigation projects.

* 3.a. Differences on method and interpretation of loan feasibility analysis (economic feasibility study) between DIGESA and BANDESA; lack of information on markets and prices by season.

3.x. True economic feasibility depends on percent of irrigated land used for high-value crops, net value of production after transportation cost to point of sale.

? 3.b. Emphasis on showing vegetables (i.e., diversified agriculture) to be more profitable than traditional crops and that this income covers repayment of mini-irrigation loans; in various cases, farmers have little interest or intent to produce vegetables.

3.y. Eliminate redundant economic analysis by use of uniform models and formats based on sound marketing and price data.

3.z. Base models on percent of land placed in high-value crops and in view of total farm profitability; develop models based on traditional crops.

4. Lack of policy toward crop production credit.

* 4.a. HADS was designed to not include crop production credit lines.

4.x. Include short-term credit line in trust fund for crop production loans for farmers with diversification experience.

4.b. Farmers new to crop diversification have fear of carrying another debt after assuming debt of irrigation infrastructure loan.

4.y. Include a budget line in infrastructure loan to pay for agricultural inputs necessary for initial one or two crop cycles for farmers with limited or no diversification experience.

I. INTRODUCTION

A. Project Description

The Highlands Agricultural Development Project (520-0274; Loan No. T-037) is an infrastructure project. Its goal is to increase agricultural productivity and its purpose is to improve the productive resource base of the rural poor. The project divides broadly into two components: the first is a natural resources component consisting of three subcomponents, which are small-scale irrigation (mini-riego), soil conservation and reforestation; and the second is a rural-roads maintenance component. A total of US\$14,782,000 was budgeted in the PP for the life of the project: US\$7,500,000 in loan funds, US\$1,500,000 in grant funds and the remainder in counterpart contributions of the GOG. One-third of both loan/grant funds and counterpart funds were budgeted for irrigation and soil conservation activities. The first loan agreement was signed on 30 September 1983, when the project began in MAGA Regions I and V. The PACD at that time was 30 September 1988.

In accordance with USAID instructions, only the irrigation and soil conservation subcomponents enter this mid-term evaluation. The report, therefore, will treat forestry and rural roads only tangentially, as they bear on irrigation and soil conservation. This is reasonable for, in a sense, HADS is three projects from the point of view of USAID management. The rural roads and forestry components each have a different AID project manager, whereas irrigation and soil conservation have a single manager. Only two Guatemalan institutions, DIGESA and BANDESA, are charged with implementing the portions of HADS under scrutiny in this evaluation. DIGESA implements the soil conservation and irrigation activities of HADS, and BANDESA administers the trust fund for irrigation loans and soil conservation social payments.

Project irrigation activities involve the construction of simple irrigation systems, mostly of the gravity-flow type, using farm labor and materials purchased through BANDESA loans. In MAGA Regions I and V, where the project began in 1983, 750 hectares were to be irrigated. Soil conservation activities involve the construction of simple bench terraces for the most part. Farmers construct these terraces with their own labor, for which they are modestly compensated by the project through so-called "social payments" from the BANDESA trust fund. In Regions I and V, an original target of 5,000 hectares was set for soil conservation.

B. Brief Project History

Both HADS and the Small-Farmer Diversification Systems Project (520-0255) are in a sense the progeny of the Small Farm Development Project (520-0233), which ended in 1983. Under that project, the soil conservation and small-farm irrigation components were viewed as pilot activities from which the technologies used presently were developed.

Several amendments have altered the original ProAg by expanding geographic coverage of the project and adding corresponding resources; however, the amendments have not changed the project program. Loan Amendment 1, dated 27 December 1984, extended the PACD to 30 September 1989, and added US\$5,000,000 to the loan and Q4,782,000 to counterpart funds. This amendment brought funding up to the original levels budgeted in the PP. The project was still active only in Regions I and V.

Loan Amendment 2, signed on 20 March 1985, extended the PACD to 30 September 1989, and added US\$3,000,000 to the loan and Q528,500 to counterpart funds. The amendment added MAGA Regions II, VI and VII to the project. US\$1,522,677 of the loan amount and Q145,462 of counterpart monies would go to soil conservation activities. Another 3,000 hectares of land would be conserved in the new regions, and 4,300 additional families benefited. US\$1,477,323 of the loan funds, and Q383,044 of counterpart funds, would go to irrigation activities, thereby irrigating 750 more hectares and benefiting 1,040 more families in the new regions.

Grant Amendment 2, signed on 27 September 1986, extended the PACD to 30 September 1990, and added US\$600,000 to the grant. Of this sum, US\$100,000 is for the short-term training of DIGESA employees in the design and management of irrigation systems as well as the marketing of produce (the remainder of the funds were for long- and short-term training for INAFOR employees).

Loan Amendment 3 was also signed on 27 September 1986, and also extends the PACD to 30 September 1989. It adds US\$3,000,000 to the loan, US\$2,520,794 to counterpart funds and takes the project into MAGA Region IV. The BANDESA trust fund was increased by US\$200,000 for social payments and DIGESA would receive US\$142,500 for operational costs for conservation work. DIGESA would provide US\$222,938 in counterpart funds. In Region IV, 700 additional hectares of land would be conserved, and 1,000 more families benefited. The BANDESA trust fund was increased by US\$300,000 for irrigation loans, and DIGESA would receive US\$134,500 in operational costs for irrigation work. DIGESA would supplement this with US\$164,403 in counterpart funds. In Region IV, 150 hectares would be irrigated and 675 families benefited. The amendment also provides funds for forestry and roads, and US\$130,000, supplemented by US\$271,644 in counterpart

monies, to buy materials and equipment for two soil/plant pathology laboratories in Regions IV and VI.

A fourth amendment is now pending, which will reprogram the surplus of dollar funds in project accounts in an effort to improve the efficiency of the project and to give it more direction. That amendment will be dealt with later in this report.

The project has, to date, been active in Regions I, II, V, VI and VII; it has not yet begun activities in Region IV because Amendment 3 was approved too late for money to enter the DIGESA budget for 1987.

C. Project Relevance to USAID and GOG Policies

Present development policies of Guatemala focus on the densely populated Western Highlands, a politically volatile region of poor peasant farm families. The country is addressing problems in this region, among other things, by expanding the "agricultural frontier" through hillside terracing and the construction of small-scale irrigation systems. These innovations, especially irrigation, make crop diversification possible and that, in turn, leads to higher levels of rural employment and income. To the extent that farmers can diversify into export crops, especially for sale in the United States or Europe, much needed foreign exchange is generated. HADS, therefore, is clearly in accord with the development policies of the Government of Guatemala.

Economic stabilization, long-term growth and equity in the distribution of economic benefits are three goals of AID policy in Guatemala that are derived from the National Bipartisan Commission on Central America. The promotion of crop diversification and exportation, which irrigation and soil conservation help to make possible, are cornerstones of AID's economic stabilization program. Diversification and exportation are also important to long-term economic growth. An increase in the income of Indian farmers in the troubled Western Highlands, an objective of HADS, promotes equity in the distribution of economic benefits. HADS, therefore, also squares well with USAID policies in Guatemala.

D. Evaluation Methodology

As already mentioned, this mid-term evaluation of HADS deals only with the small-scale irrigation and soil conservation components, in accordance with USAID instructions (see Scope of Work, Annex A). A team of three expatriate specialists in the areas of development economics, natural resources and

agricultural credit conducted the evaluation. With the exception of the credit specialist, who left on 14 November 1987, the team worked in-country from 26 October until 20 November, at which time a draft report was filed with the USAID Office of Rural Development (ORD).

According to the HADS evaluation Scope of Work, two Guatemalan evaluation team members were to be hired by USAID: a natural resources specialist and an anthropologist; but because of delays in the USAID contracting process, these national consultants were not hired and the three expatriate specialists performed the evaluation without further support.

The team visited five of the six MAGA project regions (there has been no activity to date in Region IV). Since the regions differ substantially along geomorphological, climatic and sociocultural lines, as well as in the organizational capacity of the national institutions to implement project activities, the team deemed these visits expedient. Although the team talked with at least 20 farmers, it was decided that a better use of scarce time would be to talk, instead, with the project's technical personnel in order to better understand some of the implementation problems. The team also reviewed documents germane to the project and talked with relevant personnel in the central offices of the executing agencies in Guatemala City.

II. PRELIMINARY PROJECT IMPACTS AND EXPENDITURES

A. Increased Agricultural Productivity

In order to gauge the impact of HADS on agricultural productivity, it is assumed that incomes of target beneficiaries will rise faster than those of non-beneficiaries. According to the HADS PP, a 50 percent increase in agricultural production is the measure of purpose achievement. Since this project is, strictly speaking, an infrastructure project rather than a production project, and since there exists no appropriate baseline survey data against which changes in beneficiary production and income levels can be reckoned, inferences regarding such changes must be drawn by extrapolating analyses * and conclusions (such as they often are) from other projects.

1. Lack of Baseline Survey Data

The PP did not stipulate a baseline survey as a basis for monitoring project progress and measuring project impacts. It does stipulate the "development of a computerized access roads inventory... [which] will indicate by DCR regions, socioeconomic data, physical and environmental information for: (1) possible new road sections, (2) road sections under construction, (3) sections requiring rehabilitation, and (4) road sections under maintenance" (p. 34). The Project Paper continues: "The data will not only serve the DCR in its selection and management of road construction, rehabilitation and maintenance activities, but it will also serve as a basis for inter-agency planning and decision making since it will assist in determining the viability of projects planned by other GOG agencies" (p. 35); and "this information on rural accessibility will be a critical input into other agencies' future planning decisions regarding where to best construct projects such as rural schools, health posts, grain storage facilities, and rural markets" (p. 35).

Sometime in 1984, it occurred to the AID project manager at the time, that a single survey could be conducted which would comply with stipulations in the PP for a computerized roads inventory, as well as provide a baseline against which project impact could be measured for the other project components.

Negotiations began with USPADA, which was designated by DCR, DIGESA and INAFOR in July of 1984, as the institution to conduct the survey. A letter from USPADA to the AID project manager in August of 1984 proposed the terms of reference: the survey would take seven weeks and would use a 32-page questionnaire to collect socioeconomic data on 2,700 farmers in Region V and parts of Region VI. AID revised these terms of reference a month later so the survey would include parts of Region I as well.

The actual survey was conducted in January and February of 1985 in Region V and parts of Region I. Its purpose was to collect data which could later be used not only to measure the impact of all project components, but also to implement and administer the components. Twenty-two communities were selected by technical personnel from INAFOR, DIGESA and DCR. USPADA selected survey variables "considered to be of interest to the project." No evaluation scheme (i.e., one specifying what variables would be measured and precisely how they would later be used to meet certain stated ends) seems to have been considered for any of the institutions when the survey instrument was prepared.

* Preliminary results of the USPADA survey were published in April 1985, with a promise of complete results later in the year, to be processed on the DIGESA computer. This has not yet happened, and nobody today knows much about the USPADA survey. Meanwhile, DCR had its differences with USPADA, which, it seems, did not use air photos to locate and thus consider roads, in preparing its sampling frame. Furthermore, DCR had requested additional questions in the survey instrument, which USPADA did not include. DCR, therefore, proceeded on its own to comply with the PP stipulation, and today has a computerized data bank to meet its end of establishing priorities for the construction of new roads. Such a scheme is now being planned in order to establish maintenance priorities as well.

* In sum, there exists no baseline survey suitable for monitoring soil conservation and irrigation activities under HADS, or for evaluating their impact. The survey information collected by DCR is suitable for its purposes and may, by chance, be useful to other agencies. DCR indicates that it will soon circulate the information among other agencies, to inform them of its existence. But, to emphasize once more, the DCR data cannot be used to monitor and evaluate HADS soil conservation and irrigation activities.

* HADS should eventually establish a simpler, more rational scheme for collecting baseline data--a scheme which does not involve large surveys that require long questionnaires and computer analysis. Above all, the project must abandon the notion that a single survey can do all things for all people. Finally, those persons who will use the results should be intimately involved in the survey design and analysis. This approach is discussed later, in Section III.C.1.

2. Review of Experience from Other Projects

In order to assess the changes in production and income levels of HADS beneficiaries in the absence of a baseline survey, the evaluation team reviewed several studies of impacts of similar projects in the HADS project area. It is reasonable to infer that the impacts of HADS are similar. A brief review of relevant conclusions from several of these studies follows.

The Smith Study

Gary H. Smith conducted an evaluation of the Small Farmer Development Project (520-0233) in May 1983. Like HADS, this one included small-farm irrigation, soil conservation and rural roads components. Smith conducted the evaluation alone and thus could only treat the topics in cursory fashion. Moreover, there were no baseline data, and no previous surveys had been conducted which might have supplied him with information.

Smith conducted informal interviews with farmers in MAGA Regions I and V, where the project had been active. Farmers in Santa Rita, a gravity-fed irrigation community in Region I, reported net incomes of from Q10 to Q15 per cuerda per year from the sale of surplus maize and beans prior to irrigation. With irrigation and crop diversification, their net incomes jumped to Q80 to Q100 per cuerda per year--an increase of between 400 and 900 percent (p. 28). Income gains under pump irrigation may be considerably less, though still substantial, because of fuel or electricity costs. After comparing the net incomes of farmers growing snowpeas before and after irrigation (by pump) in Region V, Smith concludes that net incomes rose by at least 20 percent (p. 30).

With regard to irrigation, Smith concludes that "where farmers have access to good roads and have been able to introduce a variety of short-season crops, irrigation has had a major impact on net earnings." In areas where maize and beans are grown on irrigated land, production has doubled over the calendar year because of an extra crop cycle (p. 32).

With regard to soil conservation, Smith obtained the data in Table 1 from farmers in Regions I and V on pre- and post-terracing crop yields (p. 20):

Table 1. Reported Increases in Yields per Cuerda* of Certain Crops Following Terracing in Regions I and V

DATA REPORTED BY FARMERS		
CROP	PRE-PROJECT	POST-PROJECT
Maize	2-3 qq**	5-6 qq
Beans	1.3 qq	3 qq
Wheat	2.0 qq	3.5-5 qq
Potatoes	5-6 qq	9-11 qq
Broad Beans	1.5 qq	2 qq
Onions	5 qq	7 qq
Garlic	4.5 qq	6 qq
Cabbage	35 bunches	47 bunches
Carrots	38 bunches	55 bunches

Source: Gary Smith (1983), p. 20.

* 1 cuerda = 25 x 25 varas = 0.043 hectare
 ** qq - quintales

Terracing alone, with other practices held constant, leads roughly to a doubling of the yields of traditional crops such as maize, beans and wheat, as well as to an increase of from 30 to 100 percent in the yields of non-traditional crops in Region V (p. 21). But several farmers also told Smith that terraced land required extra labor (because of the greater planting density) for sowing, harvesting and weeding--from 15 to 25 percent more labor than pre-terraced land in the case of traditional crops, and at least 50 percent more in the case of vegetables (p. 23).

Smith also concludes that roads, irrigation and soil conservation have largely proceeded independently of each other and thus cites the need for coordination. He further cites the need for more attention to baseline studies and to the marketing of non-traditional crops (pp. 35-36).

The Elbow and Heller Study

Gary Elbow and Peter Heller conducted a quick impact survey of the Small Farmer Development Project (520-0233) in March 1984, focusing mainly on irrigation activities. The survey sampled 81 irrigators (51 percent sample) and 44 non-irrigators (15 percent sample) in three municipios of the Western Highlands: San Antonio de Sacatepequez, San Marcos; Zaragoza, Chimaltenango; and Santo Domingo Xenacoj, Sacatepequez. These municipios fall today within the HADS project area. According to the authors,

irrigation leads to crop diversification. In San Antonio de Sacatepequez, for example, where the irrigation system was the oldest, 99.4 percent of the land of non-irrigators in the sample was in maize, beans and wheat, whereas only 76.5 percent of the land of irrigators was in those crops. Of the remaining irrigated land, 12.2 percent was in potatoes, 2.6 percent in brussels sprouts, 2.2 percent in cabbage, 1.6 percent in cauliflower, 1.5 percent in carrots and 1.6 percent in green beans. Small amounts of land were also in beets, radishes, turnips and miltomate (pp. 6-7). The study further revealed that irrigators in Zaragoza, with only 63.9 percent of their land in the traditional crops of maize and beans, had specialized in the production of strawberries, with 33 percent of their irrigated land in that crop. And in Santo Domingo, 24 percent of irrigated farm land was in snowpeas. The authors speculate that water security may eventually lead to specialization along community lines, and wonder whether San Antonio might not also specialize in time (p. 7).

X The researchers report several unsolicited farmer testimonials that irrigation and terracing increase production. The survey also turned up complaints, the most frequent of which was in reference to marketing problems. And in Zaragoza, where there is a pumped irrigation system, farmers complained that high electricity costs were absorbing their profits (p. 14).

The authors took a cursory look at terracing and report that among irrigators in the sample, only two have terraced lands in Santo Domingo, five in Zaragoza and 25 in San Antonio. Only one sampled non-irrigator in the three communities had terraces (p. 18). Terracing, therefore, if it exists at all, seems to parallel irrigation; however, only a minority of irrigated lands are terraced. The researchers hypothesize that the relatively higher incidence of terracing in San Antonio owes to the greater slope of the land there, where the advantages of the practice (e.g., greater yields) are immediately apparent. The advice of change agents, therefore, would be more readily heeded in San Antonio than in the other two municipios, where the lands are less sloping and the advantages of terracing are thus less apparent (pp. 4-5).

Elbow and Heller conclude from their survey that "participants in Project 520-0233 activities, especially irrigation, live better, produce and sell more, and are more apt to use national government services than non-irrigators" (p. 13). They also underscore the need for good baseline data to measure project progress, as well as the need to give high priority to marketing, "both in any plans to further develop existing irrigation and terracing projects and to develop new projects" (pp. 15-16). *

The Sloan Study

In 1986, Todd Sloan conducted an impact survey of USAID-financed irrigation and/or soil conservation projects in the Quiché area of the Northwest Highlands (MAGA Region I). He sampled project participants and non-participants in four communities: Nimasac, Xesana, Xecaja and Casa Blanca. The figures in Table 2 (which the author qualifies as "preliminary") are extracted from two of Sloan's reports (Progress Reports 2 and 3). An irrigation and soil conservation project began in Nimasac in March 1985, and in Xecaja and Casa Blanca only in March 1986. Xesana has only a soil conservation project, which began in 1983.

Table 2. Farmers Planting Vegetables

	<u>Nimasac</u>	<u>Xesana</u>	<u>Xecaja</u>	<u>Casa Blanca</u>
Plant Vegetables Participants	100% (16)*	0% (10)	20% (15)	21% (19)
Non-participants	0% (10)	10% (10)	0% (5)	0% (6)

Source: Sloan (1986), Progress Reports 2 and 3.

*Figures in parentheses represent sample size.

The figures in Table 2 suggest that irrigation does promote crop diversification, here in the form of vegetables. And Sloan concludes that project farmers are earning more through the sale of vegetables than they did when they planted only maize and beans. The author says in Xesana, that terracing alone has led to increases in maize production. Twenty percent of participants have shown increases of 200 percent or more, and 40 percent have shown increases of 100 percent or more (pp. 5-6, Progress Report 2).

The IFPRI Study

One of the more carefully quantified studies of the relation of export vegetables to the production, consumption and nutrition patterns of small farmers in the Western Highlands was conducted by the International Food Policy Research Institute (IFPRI), in collaboration with the Institute for Nutrition in Central America and Panama (INCAP). The study is based on two surveys of rural households (400 families) conducted in 1983 and 1985. Families were divided into two groups: one producing export vegetables (snowpeas, broccoli, cauliflower and parsley) and the other

producing only traditional crops. The export producers belong to the cooperativa Cuatro Pinos.

Figures from Table 3 are from the 1985 survey and are for the 1984-1985 cropping season. The export vegetables are, for the most part, grown under irrigation, while the traditional crops are not. The gross margin of snowpeas, the most lucrative crop, is more than 15 times that of maize, and its return to a day of family labor, more than double that of maize. Although the market price of snowpeas fluctuates considerably, and the subsequent devaluation of the quetzal in 1986 resulted in substantial cost increases, its superior earnings still make the crop attractive to many farmers.

Impact of the Small Farmer Diversification Systems Project

An impact survey was conducted by the Small Farmer Diversification Systems Project (520-0255) in early 1987. That project had irrigation, soil conservation and crop production components (credit and technical assistance). As with other USAID irrigation projects, there were no reliable baseline data against which to measure progress. The survey included about 800 beneficiaries and 400 non-beneficiaries from MAGA Region I. The weighted average-annual net income from crops on beneficiary farms was Q1,020, while that for non-beneficiary farms was Q88. The income of beneficiary farms, therefore, was 11.6 times that of non-beneficiary farms (data from unpublished preliminary survey results). Most but not all of the beneficiary farms had irrigation and/or terraces, and the income-generating crops were vegetables.

The final evaluation of this project (ARD, 1987) also addressed its impact on farm incomes. The evaluation team referred to the results of the survey just cited, but seriously challenged them on grounds that there were no baseline data and that the methodology of the survey was seriously flawed. Nevertheless, the team concluded that the project, as a whole, was viable and calculated a satisfactory project IRR of about 15 percent over 20 to 25 years (see pp. 16, 85 of that evaluation report). The evaluation team further cited the need for greater attention to marketing issues. *

3. Findings

A synthesis of the findings of the above studies strongly suggests the conclusion that, other things equal, the incomes of beneficiaries of soil conservation works and irrigation systems do indeed rise faster than and exceed the incomes of non-beneficiaries. The findings also support the conclusion that soil conservation and irrigation lead to at least a 50 percent *

Table 3. Cost of Production and Gross Margins of Export Vegetables and Subsistence Crops (1984/85 Average Values from Cooperative Member Farms)

Items, Costs	Traditional Crops			New Export Crops	
	Maize	Beans ^a	Traditional Vegetables	Broccoli/ Cauliflower	Snowpeas
	(Quetzales per hectare, mean values of sample)				
Seeds, plants	0.21	26.55	106.30	85.76	54.87
Fertilizer	105.60	85.28	158.61	243.82	216.16
Other inputs	<u>14.85</u>	<u>55.10</u>	<u>167.95</u>	<u>103.88</u>	<u>1,296.13</u>
Total inputs	120.66	166.98	432.86	433.46	1,567.16
Wages paid	167.71	133.69	306.06	283.58	552.71
Value of output	457.80	681.00	1,804.53	1,339.17	4,416.20
Gross margin/ha. ^b	<u>143.87</u>	<u>362.79</u>	<u>1,065.61</u>	<u>593.37</u>	<u>2,204.15</u>
	(Days per hectare, mean values of sample)				
Days of family labor per ha. ^c	54	121	299	168	400
Days of total labor per ha. ^d	119	172	416	277	613
	(Quetzales per day mean values of sample)				
Gross margin per day of family labor	2.66	2.99	3.47	3.53	5.51

Source: IFPRI (1987), p. 58

^aBeans in sole stand.

^bTo compute the gross margin from value of output and wages, total inputs interest on the sum of purchased inputs and on the part of the wage bill for nonharvest labor is deducted. The interest rate used is 15 percent, adjusted to the duration of the crop's growing period.

^cMen's, women's and children's labor days are weighted by 1.0, 1.0, 0.6, respectively.

^dThis includes hired labor.

increase in agricultural production. The goal and purpose of HADS, therefore, are entirely reasonable. However, other things are not always equal.

It is important to realize that income gains, certainly substantial ones, are achieved through diversification away from the traditional maize, beans and wheat, and toward non-traditional crops such as vegetables. Such gains are necessary to finance the irrigation systems. But the income gains suppose, in turn, the existence of viable markets for non-traditional crops, and some level of technical assistance to produce them.

A viable marketing scheme is crucial. Several of the above-mentioned studies emphasized the need for attention to marketing issues, a need that would become greater with time and increased levels of production. The Smith study stressed this need as early as 1983. The HADS evaluation team would further emphasize that need today. A lack of markets and marketing information, volatile price swings and product quality control are all dimensions of the marketing problem. *

B. HADS Products and Expenditures

1. Expenditures

Table 4 gives USAID loan obligations and commitments by MAGA region through 1987. Funds are "obligated" through the initial ProAg and subsequent amendments (here, three), and are "committed" as the final step before actual expenditure. Expenditures do not appear in the table, but they differ from commitments only marginally at any given time. Funds "reprogrammed" refers to a reprogramming of uncommitted funds through a pending fourth amendment. More on that amendment is presented later in this report.

Contributions of grant funds, not included in the table, have been small. US\$37,716 were spent by USPADA on a baseline survey in early 1985 which remains incomplete--and would have been of little use to the project anyway. US\$53,011 (from the obligation incurred through Grant Amendment 2) has been committed, as of 30 October 1987, to the short-term training of DIGESA irrigation and soil conservation personnel.

Counterpart expenditures are not included in the table for * several reasons. First, figures are either not readily available, or are available only in partial form. Second, the time intervals for counterpart data reported do not square with those of USAID, making the two classes of data difficult to combine. And third, a substantial portion of counterpart contributions does not take the form of discrete monetary amounts

Table 4. USAID Loan Funds by Activity and Region

HIGHWAYS AGRICULTURAL DEVELOPMENT PROJECT (AID PROJECT 520-0271)
 SMALL SCALE IRRIGATION AND SOIL CONSERVATION COMPONENT
 BANDES A AND DIGESA - AID LOAN FUNDS 520-1-037

LINE ITEM	NAME	AMOUNT OBLIGATED AS OF 9/30/87	COMMITTED AMOUNT AS OF 12/31/87	UNCOMMITTED BALANCE AS OF 12/31/87	BUDGETARY MOVEMENT FOR REPROGRAMMING		REPROGRAMMED BUDGET	DIFFERENCE FROM ORIGINAL BUDGET
					--- DECREASE ---	--- INCREASE ---		
	Small scale irrigation and soils conservation - BANDES A and DIGESA	87,259,000	81,332,021	45,926,500	11,616,756	4,237,211	87,259,000	0
61	Operational Fund - DIGESA	81,940,476	8457,172	81,481,504	828,332	889,009	81,553,000	144,476
	Operational funds - Small scale irrigation DIGESA	8834,156	8186,227	8617,229	8157,441	878,812	8635,053	199,103
	Region I	8147,000	849,060	8106,540	836,500	80	8106,500	40,500
	Region II	891,162	831,012	858,150	80	812,700	867,000	811,162
	Region IV	8154,500	80	8154,500	854,000	80	8100,500	54,000
	Region V	8147,000	849,254	897,246	80	818,030	810,000	37,246
	Region VI	8133,465	827,224	811,621	825,912	80	8107,553	25,912
	Region VII	8161,029	836,677	8124,352	841,029	80	8120,000	41,352
	Operational funds - Soil Conservation DIGESA	81,106,320	8270,945	8835,275	8122,891	879,872	8765,000	40,320
	Region I	8320,500	885,566	821,934	820,500	80	820,000	100,500
	Region II	8121,681	821,568	8109,113	821,681	80	8109,000	21,681
	Region IV	8162,500	80	8162,500	879,553	80	862,947	99,553
	Region V	8320,500	8109,360	8211,194	80	815,759	820,000	10,194
	Region VI	896,157	822,539	873,616	81,157	80	870,000	26,157
	Region VII	884,982	826,966	856,616	80	812,000	88,000	96,982
62	Trust fund - credit for Small scale irrigation BANDES A	82,413,667	8433,661	81,980,006	8352,667	8322,177	81,659,000	834,667
	Region I	8511,000	8142,872	8165,128	80	8120,000	8100,000	11,000
	Region II	8195,970	822,892	8173,078	845,070	80	8150,000	45,970
	Region IV	8306,166	80	8306,166	850,000	80	825,000	51,166
	Region V	8511,000	8170,085	8341,115	80	817,500	820,000	11,085
	Region VI	8499,700	851,030	8448,670	848,700	80	8400,000	99,700
	Region VII	8346,891	826,861	8320,030	82,000	80	828,000	68,891

Table 4 Continued

HIGHLANDS REPLICATION DEVELOPMENT PROJECT (AND PROJECT SUB-PROJECTS)
SMALL SCALE IRRIGATION AND SOIL CONSERVATION COMPONENT
DANIELSSON AND DILLON AND LOAN FUNDS SEP-1-1987

LINE ITEM	DESCRIPTION	AMOUNT OBLIGATED AS OF 9/30/87	COMMITTED AMOUNT AS OF 12/31/87	RECOMPENSED AMOUNT AS OF 12/31/87	PROBLEMS IDENTIFIED FOR RELEASE	PROBLEMS IDENTIFIED FOR DEFERRAL	AMOUNT OBLIGATED UNDER	DIFFERENCE FROM ORIGINAL TABLE
63	Trust Fund - SICRIST Payment for Soil Conservation - DANIELSSON	\$2,754,657	\$151,165	\$2,393,472	\$993,357	\$298,302	\$1,517,000	(\$1,256,657)
	Region I	\$667,500	\$231,079	\$176,401	\$0	\$66,302	\$125,000	(\$442,500)
	Region II	\$562,716	\$39,144	\$523,566	\$367,710	\$0	\$125,000	(\$127,710)
	Region IV	\$200,000	\$0	\$200,000	\$75,000	\$0	\$125,000	(\$75,000)
	Region V	\$667,500	\$90,384	\$577,116	\$317,500	\$0	\$125,000	(\$452,500)
	Region VI	\$278,207	\$26,751	\$251,456	\$128,207	\$0	\$150,000	(\$128,207)
	Region VII	\$378,940	\$53,807	\$325,133	\$64,940	\$0	\$294,000	(\$31,133)
64	Introduction Credit - DANIELSSON	\$0	\$0	\$0	\$0	\$800,000	\$800,000	\$800,000
65	Agricultural Laboratories - DIGESA	\$150,000	\$0	\$150,000	\$20,000	\$0	\$130,000	(\$20,000)
	Region IV	\$75,000	\$0	\$75,000	\$10,000	\$0	\$65,000	(\$10,000)
	Region VII	\$75,000	\$0	\$75,000	\$10,000	\$0	\$65,000	(\$10,000)
66	Micro-Computers - DIGESA	\$0	\$0	\$0	\$0	\$400,000	\$400,000	\$400,000
67	Operational Funds - DANIELSSON	\$0	\$0	\$0	\$0	\$550,000	\$550,000	\$550,000
	Region I	\$0	\$0	\$0	\$0	\$110,000	\$110,000	\$110,000
	Region II	\$0	\$0	\$0	\$0	\$124,000	\$124,000	\$124,000
	Region IV	\$0	\$0	\$0	\$0	\$124,000	\$124,000	\$124,000
	Region V	\$0	\$0	\$0	\$0	\$124,000	\$124,000	\$124,000
	Region VI	\$0	\$0	\$0	\$0	\$124,000	\$124,000	\$124,000
	Region VII	\$0	\$0	\$0	\$0	\$124,000	\$124,000	\$124,000
68	Technical Assistance and Promotion	\$0	\$0	\$0	\$0	\$120,000	\$120,000	\$120,000
69	Agreement DIGESA-USAC	\$0	\$0	\$0	\$0	\$200,000	\$200,000	\$200,000

deposited in some project account, but consists instead of personnel and overhead cost figures imputed arbitrarily to project activities.

2. Products Versus Expenditures: Lethargy and a Surplus of Dollars

Perhaps the most salient observation to be made from Table 4 is that an unusually small fraction of the obligated funds has been spent. In AID parlance, there is a "pipeline" problem. The following two sections of the report will analyze that problem in the context of project implementation rates for small-farm irrigation and soil conservation activities in the six MAGA regions.

Small-Scale Irrigation

Financial expenditures for development have meaning only in relation to the products they attract for their intended beneficiaries. Accordingly, Table 5 merges irrigation expenditures, products and beneficiaries and shows some relations among them. Expenditure figures (provided by USAID) refer exclusively to disbursements* from the BANDESA trust fund through 31 December 1987. Data on hectares irrigated and farms benefited were provided by BANDESA, and refer exclusively to funds disbursed from the trust fund through 31 October 1987. The AID expenditure figures, therefore, are about two months out of phase with the BANDESA data. The probable effect is to slightly underestimate project progress.

Table 5 addresses implementation rates by region, and seeks, through the development of an index, to "factor out" that fraction of implementation "lethargy" (apparent, not real) due to changes in the macroeconomic environment. Part of what remains is attributable to real lethargy, or to inefficient institutional policies, procedures and interactions. But the magnitude of this part is difficult to know with precision for the following reason.

When the physical objectives were established for the project, the assumption seems to have been that they would be achieved exclusively through loans made available from the trust fund. However, DIGESA uses its staff to construct irrigation systems that are not funded by USAID, and progress statistics

*Or rather to AID funds committed to the trust fund, which slightly exceed actual disbursements at any given time; were the percentages in Column 3 of Table 5 based on disbursements, they would be lower, though not significantly so.

Table 5. Irrigation Implementation Rates By Region

Highlands Agricultural Development Project. - Mid-Term Evaluation
 Small Scale Irrigation Sub-component.
 Lethargy Rate per Region

REGION	(1) Obligation of 12/31/87	(2) Committed as of 12/31/87	(3) %	(4) % Adjusted	(5) Irrigation Programmed (Has)	(5) Irrigation Implemented (Has)	(6) %	(6) % Adjusted	(7) Farms Programmed	(8) Farms Benefitted	(9) %	(9) % Adjusted	(10) % Time Elapsed	(11) % Implementation
I	\$511,000	\$142,872	27.96%	97.86%	375	175.3	46.73%	163.57%	200	615.0	307.50%	1975.25%	58.00%	9.
II	\$195,970	\$22,892	11.68%	29.20%	98	5.4	5.51%	13.78%	236	24.0	10.17%	25.42%	57.00%	0.
IV	\$300,000	\$0	0.00%	0.00%	192	0.0	0.00%	0.00%	675	0.0	0.00%	0.00%	27.00%	0.
V	\$511,000	\$136,686	26.75%	93.62%	375	133.5	35.59%	124.55%	200	110.0	55.00%	192.50%	68.00%	2.
VI	\$493,700	\$54,530	10.93%	27.34%	280	14.3	5.11%	12.78%	457	40.0	8.75%	21.65%	57.00%	0.
VII	\$396,997	\$66,687	16.80%	41.99%	404	50.5	12.50%	31.24%	366	53.0	14.40%	36.01%	57.00%	0.
TOTAL	\$2,413,667	\$423,667	17.55%		1724	378.9	21.98%		2136	842.0	39.42%			
Average				48.34%			17.57%	57.65%				225.34%	55.67%	2.

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(e.g., hectares irrigated and families benefited) reported by DIGESA regional offices commonly include all systems constructed. Also, AID has made loan funds available (through the amendments) to DIGESA for operational costs, and those funds have been used to provide technical assistance to build systems financed by sources other than the trust fund (Plan Foster, Government of Spain, Christian Children's Fund, etc.). Movement within the fund, therefore, does measure project progress with respect to achieving the programmed objectives with fund money and, to a large degree, measures the efficiency of interaction among the participating institutions--BANDESA, DIGESA and USAID. Slow movement, however, does not necessarily indicate an inherent incapacity for implementation on the part of DIGESA, since in some of the regions, the institution is using its limited staff to implement irrigation construction with other than HADS trust funds.

The numbers at the heads of table columns represent variables as defined below. In order to fully comprehend the table, these definitions must be read carefully:

- (1) Amount obligated over project life, including original obligation and subsequent obligations incurred through amendments.
- (2) Amount committed through 31 December 1987.
- (3) Total commitment as percent of total obligation [$= (2)/(1)$]. Adjusted figures represent total commitment as percent of total obligation, had that commitment kept pace with real implementation costs (as reflected by inflation and devaluation) required to reach the indicated targets. Q2.25 in June of 1987 had the purchasing power of Q1.00 in late 1983 when the project began. Also, currency devaluation directly affected the cost of irrigation materials; for example, the bank exchange rate went from Q1.50 to Q4.00 to the dollar between January and September of 1985. For Regions I and V, therefore, the adjusted figures incorporate an estimated corrective factor of 3.5. In Regions II, VI and VII, by contrast, the estimated corrective factor is only 2.5, since those regions did not enter the project (through Amendment 2) until March 1985. Q1.62 in June 1987 had the purchasing power of Q1.00 in March 1985.
- (4) Number of irrigated hectares programmed for life of project.
- (5) Number of hectares irrigated as of 31 October 1987 (figure from BANDESA).

- (6) Hectares irrigated as percent of hectares programmed [$= (5)/(4)$]. Adjusted figures incorporate the corrective factor as explained for column (3).
- (7) Number of farm-family beneficiaries programmed for life of project.
- (8) Number of farm families benefited as of 31 October 1987 (figures from BANDESA).
- (9) Number of benefited families as percent of programmed families [$= (8)/(7)$]. Adjusted figures incorporate the corrective factor as explained for column (3).
- (10) Time elapsed (years) from signing of obligation agreement until 31 October 1987, as percentage of time between that signing and the agreement's anticipated PACD.
- (11) These are lethargy indices obtained by dividing the arithmetic mean of real goal implementation rates [the adjusted figures in columns (6) and (9)], by percentage of time elapsed [column (10)]. An index of 1.0 means that the project is exactly on schedule with regard to reaching its programmed targets (hectares irrigated and families benefited). An index greater than 1.0 means that the project is ahead of schedule, while an index of less than 1.0 means it is behind schedule.

Table 5 suggests the following conclusions:

- By far, most of the dollars remaining in the project account for the regions are there because the original agreement and two of the amendments were signed when the quetzal was on a par with the dollar. The subsequent devaluation of the quetzal thus led to a surplus of dollars since fewer dollars had to be converted to supply the quetzal amounts budgeted by national institutions through the loan agreements.
- Real project implementation rates (the adjusted rates in the table) have been far better than dollar disbursement rates would indicate. Indeed, the average value of the "lethargy index" for the six regions is 2.1, which suggests that the project is ~~is~~ ahead of schedule in real terms (an index value of 1.0 would mean that the project is exactly on schedule). An analysis of disbursement rates and time elapsed leads to a similar conclusion. The average adjusted disbursement rate for the six

* regions is about 48 percent, a figure that compares more favorably with the average-time-elapsed figure of 56 percent, than does the unadjusted-disbursement-rate figure of 17 percent. This same conclusion can also be reached by comparing AID money obligated with BANDESA money disbursed from the trust fund, since physical objectives were set, and national budgets prepared, for all regions (except Region IV, which entered the project in 1986, after the official devaluation of the quetzal) when the quetzal was on a par with the dollar. Excluding Region IV, a total of US\$2,113,667 has been obligated, whereas only Q937,413, or 44 percent of the obligated money, had been spent by 31 October 1987. Again, this figure compares favorably with both the average adjusted disbursement rate of 48 percent and the average-time-elapsed figure of 61 percent (with Region IV removed).

- The indices in the last column of the table can be used to rank the regions by lethargy of project implementation. Ordered by increasing lethargy of implementation, the regions are I, V, VII, II, VI and IV. This lethargy derives from multiple sources, several of them lying deep within the central-office bureaucracies of the participating institutions, others located on the implementation periphery of those institutions. However, it is important to recall, as the figures below reveal, that in some of the regions DIGESA has used its limited staff, with the help of AID loan funds for operations, to construct irrigation systems financed with other than the HADS trust fund money (some of the financing has come from non-AID grant funds).

In reporting data on hectares irrigated, DIGESA regional offices do not always disaggregate that fraction attributable to HADS trust-fund financing from total figures. The following figures were supplied by the regional offices for total work completed, and to be completed, by 31 December 1987. The offices were asked to disaggregate those hectares irrigated with HADS trust funds.

<u>Region</u>	<u>Total Hectares Irrigated</u>	<u>Hectares Financed by HADS Trust Fund</u>
Region I	215	215 (100% of total)
Region II	22	18 (82%)
Region IV	0	0
Region V	169.45	107 (63%)
Region VI	data unavailable	
Region VII	102	61 (60%)

The above figures suggest that about 20 percent of the land irrigated with DIGESA assistance was financed outside of the HADS trust fund.

Soil Conservation

Table 6 deals with soil conservation activities, but is otherwise similar to Table 5 with regard to purports. Expenditure data were provided by USAID and refer to BANDESA trust-fund disbursements for social payments through 31 December 1987. Data on hectares conserved and families benefited were provided by BANDESA and are for the period through 31 October 1987.

Disbursement rates of social payments from the trust fund do not reflect macroeconomic changes (inflation and devaluation) to the degree that disbursement rates for irrigation loans do, since no goods are purchased or imported. The payments have not varied much (except across regions) since the project began. As in Table 5, for trust-fund irrigation loans, an implementation index for soil conservation appears in Column 11 of Table 6. The index, however, must be interpreted cautiously since physical achievements (e.g., hectares conserved and families benefited) in the table represent only those facilitated by social payments from the BANDESA trust fund. In actuality, DIGESA promotes soil conservation without the use of social payments, and even uses HADS project loan funds established for that purpose.

According to the AID project manager, DIGESA records do not disaggregate physical achievements facilitated by social payments from those not so facilitated. Unfortunately, the physical data obtained by the manager from DIGESA regional offices are either incomplete or else fail to square, even remotely, with those reported by BANDESA, and so could not be used in this report. The index, therefore, measures rate of implementation of project programmed objectives, as those objectives are achieved through social payments from the trust fund. The intent of the PP is that those objectives be achieved through the use of such payments (p. 15).

Highlands Agricultural Development Project. - Mid-Term Evaluation
 Soil Conservation Sub-component.
 Lethargy Rate per Region

REGION	(1) Obligation	(2) Committed as of 12/31/87	(3) %	(3) % Adjusted	(4) Cons. Programmed	(5) Cons. Implemented	(6) %	(7) Farms Programmed	(8) Farms Benefitted	(9) %	(10) % time Elapsed	(11) Implemen- tation Index
I	\$667,500	\$231,049	34.61%	88.54%	(Has) 2500	(Has) 529.5	21.18%	2,000	2,406.0	120.30%	68.00%	1.04
II	\$562,710	\$39,144	6.96%	17.39%	950	97.3	10.24%	1,738	756.0	43.50%	57.00%	0.47
IV	\$200,000	\$0	0.00%	0.00%	700	0.0	0.00%	2,100	0.0	0.00%	27.00%	0.00
V	\$667,500	\$90,384	13.54%	33.85%	2500	707.8	28.39%	2,000	1,684.0	84.20%	68.00%	0.93
VI	\$276,207	\$36,751	13.21%	33.02%	1482	1,188.7	80.21%	1,482	1,506.0	101.62%	57.00%	1.55
VII	\$378,940	\$53,007	14.20%	35.50%	586	240.1	40.96%	1,172	1,206.0	102.90%	57.00%	1.25
TOTAL	\$2,754,857	\$451,135	16.38%	40.94%	8716	2,765.3	31.72%	10,492	7,558.0	72.04%		
Average			13.75%				30.16%				55.67%	0.87

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Table 6. Soil Conservation Implementation Rates By Region

As with irrigation, an index value approximating "1" suggests that the project is achieving its objectives in a timely fashion, and a value significantly less than "1" suggests implementation lethargy. A low index value, however, does not necessarily indicate an inherent incapacity on the part of DIGESA to implement soil conservation activities.

The numbers at the heads of table columns represent variables as defined below. The definitions should be read carefully before using the table.

- (1) Amount obligated over project life, including original obligation and subsequent obligations incurred through amendments.
- (2) Amount committed through 31 December 1987.
- (3) Total commitment as percent of total obligation [= (2)/(1)]. To account for devaluation of the quetzal, the percentages in the left of the column are multiplied by a factor of 2.5 to give an adjusted figure. The adjusted figure represents what would have been spent had the macroeconomic environment remained stable (at the same actual activity levels) since project implementation began.
- (4) Number of hectares programmed for conservation over life of project.
- (5) Number of hectares conserved through 31 October 1987 (figures supplied by BANDESA).
- (6) Hectares conserved as percent of hectares programmed [= (5)/(4)].
- (7) Number of beneficiary families programmed for life of project.
- (8) Number of families benefited as of 31 October 1987 (figures supplied by BANDESA).
- (9) Number of families benefited as percent of number programmed [= (8)/(7)].
- (10) Time elapsed (years) from signing of obligation agreement until 31 October 1987, as percent of time between that signing and the agreement's anticipated PACD.
- (11) These are lethargy indices obtained by dividing the arithmetic mean of goal implementation rates by percent of time elapsed [column (10)]. An index of

"1" means that the project is exactly on schedule with regard to reaching its targets (hectares conserved and families benefited). An index greater than "1" means the project is ahead of schedule, and an index of less than "1" means it is behind schedule.

Table 6 suggests the following conclusions:

- Most of the dollars remaining in the project account for the regions are there because the original agreement and two of the amendments were signed when the quetzal was on a par with the dollar. The subsequent devaluation of the quetzal thus led to a surplus of dollars since fewer dollars had to be converted to supply the quetzal amounts budgeted by national institutions through the loan agreements. A comparison of the total adjusted disbursement rate (column 3) for the six regions (=41 percent) with the average time elapsed (=56 percent), gives a better idea of what expenditures might have been (at actual physical implementation levels), had there been no macroeconomic changes (e.g., devaluation) over the project life to date. This same conclusion can also be reached by comparing AID money obligated with BANDESA money disbursed from the trust fund, since physical objectives were set, and national budgets prepared, for all regions (except Region IV, which entered the project in 1986, after the official devaluation of the quetzal) when the quetzal was on a par with the dollar. Excluding Region IV, a total of US\$2,554,857 has been obligated, whereas only Q1,015,675, or 40 percent of the obligated money, had been spent by 31 October 1987. And again, this figure compares favorably with both the adjusted disbursement rate of 41 percent and the average-time-elapsed figure of 61 percent (with Region IV removed).
- X ● Overall, the project is somewhat behind schedule (but not to the degree that dollar expenditures would indicate) with respect to reaching its targets; the average implementation-rate index of 0.87 (column 11) suggests this (the index would be 1.0 were the project exactly on schedule). But the project is not behind in all regions, and is ahead of schedule in regions I, VI and VII. Ranked by decreasing lethargy of implementation, the regions are VI, VII, I, V, II and IV. The implementation-rate index and the ranking of the regions assumes that, in accordance with the intent of the PP (p. 15), programmed objectives were to be met exclusively through the trust fund. However, it

must be remembered that lands have been conserved through DIGESA efforts without the use of social payments, and that those efforts have used AID loan funds to cover operational costs.

Costs and Benefits

Because of a total lack of baseline data and a dearth of reliable economic data, of any kind, relating specifically to HADS (or to several other AID projects, for that matter), only the simplest kind of cost-benefit analysis is possible, even assuming one does away with all but the most primitive concern for intellectual integrity.

Table 7 gives, by MAGA region, costs per hectare affected and per family benefited for both irrigation and soil conservation. All figures were provided by BANDESA and represent expenditures from the trust fund for 1986. A single year, 1986, when all the regions (except IV) were involved in the project, was chosen for this analysis in order to reduce the uneven effects of inflation that would have skewed the results, had aggregate expenditures over the life of the project been used. Irrigation expenditures cover material costs only, and soil conservation expenditures are for social payments to farmers. Since the expenditures do not include counterpart contributions, the cost-benefit ratios apply only to the USAID loan investment, not to the total project investment. The ratios may be more useful as indicators of relative costs by region than as absolute indicators.

In order of decreasing material cost per hectare irrigated, the regions are V, II, VII, VI and I. In order of decreasing costs per family, the regions are V, VII, VI, II and I. Many of the systems in Region V use pumps, while those in Region I are almost all of the gravity-flow type and therefore less expensive. Region I also has a high rural population density, so that a single system can include more families and thus benefit from economies of scale. Cost per family is lowest for Region I and highest for Region V.

Data interpretation is more difficult in the case of soil conservation, because social payments vary by type of conservation structure, slope and region, in accordance with the opportunity cost of labor. In order of decreasing cost per hectare of land conserved, the regions are II, VII, V, I and VI. In order of decreasing cost per family, the regions are II, V, VI, I and VII.

Table 7. Benefits and Costs (1986)
(Quetzales)

	Expenditures (to 12/31/87)	Area Affected	Cost per Hectare	Families Benefited	Cost per Family
Region I					
Irrigation	229,550	94.14	2,439	377	609
Soil Cons.	130,797	329.77	397	1,455	90
Region II					
Irrigation	10,000	3.55	2,817	16	625
Soil Cons.	59,360	32.20	1,843	276	215
Region IV					
Irrigation	NO ACTIVITY				
Soil Cons.					
Region V					
Irrigation	35,274	10.03	3,517	15	2,352
Soil Cons.	92,409	231.69	399	673	137
Region VI					
Irrigation	19,097	8.04	2,375	19	1,005
Soil Cons.	52,301	322.92	162	637	120
Region VII					
Irrigation	69,222	27.31	2,535	44	1,573
Soil Cons.	55,444	104.23	532	436	87
All Regions					
Irrigation	363,143	143.07	2,538	471	771
Soil Cons.	390,311	1,020.81	382	3,477	112

C. Conclusions

In the presence of viable market outlets and appropriate technical assistance (and technology) to farmers, the goal and purpose of HADS are entirely reasonable and the evidence is strong that the incomes of project beneficiaries do indeed rise faster than those of non-beneficiaries, and that beneficiaries achieve at least a 50 percent increase in agricultural production.

The large surplus of project funds in dollar accounts results mainly from the devaluation of the quetzal. With devaluation, it takes fewer dollars to purchase the quetzals budgeted by implementing institutions. The project, therefore, should not be unduly arraigned for this surplus. From the perspective of the implementing institutions, devaluation has produced inflation and an erosion of purchasing power, thereby slowing them from reaching targets programmed by the project. One must recall that the quetzal amounts budgeted by the institutions were fixed through agreements entered into when the quetzal was on a par with the dollar.

Project-implementation lethargy cannot be attributed entirely to changes in the macroeconomic environment; there have indeed been problems with regard to institutional policies and procedures, and to inter-institutional coordination of activities. These are examined in succeeding sections of this evaluation report. *

III. SMALL-SCALE IRRIGATION AND SOIL CONSERVATION

A. Small-Scale Irrigation (Mini-Riego)

Techniques of small-scale irrigation have been promoted through at least three AID-financed projects (Small Farmer Development-0233; Small Farmer Diversification-0255 and HADS). As documented in Section II of this report, the impact of these small-scale irrigation systems on their beneficiaries has been overwhelmingly positive, by increasing on-farm income and levels of nutrition as well as increasing the technological level of the farmers that manage them. Farmers are becoming more and more efficient in the selection and use of improved seed and crop varieties, application of fertilizers and use of pesticides--all culminating in a more diversified and "technified" farm, capable of generating significantly higher incomes per unit of land.

According to the HADS PP (p. 13), small-scale irrigation structures of the following design would be constructed under the project:

- On-Farm - Simple Diversion, Gravity-Flow System.
This example assumes that a farm is close to sufficient water, which means it is next to or running through the farm. Under these conditions, a simple diversion system with gravity ditching and complete open furrows will be constructed.
- Community - Simple Diversion, Gravity-Flow System.
For this example, a stream flow, adjacent to or flowing through the land to be irrigated, of two cubic feet/second is assumed along with four inches of weekly irrigation water delivered to each individual plot. This system, consisting of a rock and earth diversion dam, gravity canals and open furrows, would be constructed.
- Community - Simple Diversion, Gravity Pipe System.
This alternative assumes flow of two cubic feet/second from a stream that can be diverted from high up on a steep hill. The system is designed to provide sufficient pressure for sprinklers and would be constructed using an entrance box, settling basin structure and appropriate pipelines.
- Lake and River Community - Pump Irrigation System.
Under this assumption two cubic feet/second of water (900 gallons/minute) would be lifted from the water supply for gravity-flow distribution. This more complex system would require a pump, motor, pipe

system, sprinklers, installation and annual operating costs.

Of these systems it was estimated that approximately 80 percent will be of the simple diversion, gravity-flow type. An overall goal of 109 systems irrigating 1,724 hectares is projected for the life of the project. As presented in Section II, only 22 percent of this goal has been met with regard to total hectares to be irrigated. A total goal of beneficiary families was projected at 2,136 for this activity, 39 percent of which (or 842) has been met to date.

In actuality, the most popular system being implemented, by a large majority, is the third type mentioned above--simple diversion, gravity-fed pipe system with low-head sprinklers. The system normally consists of a small diversion/receptacle (caja receptora) built in a perennial upland spring or stream, from which water is gravity-fed through a PVC conduit of from two- to six-inch diameter, down sufficient incline to build adequate head to drive water throughout an eventual distribution system at the farm level. This system usually consists of one or various water mains and anywhere from four to eight outlets (chorros) per hectare, from which water is distributed to crops through oscillating sprinkler heads (aspersoras). Depending on the amount of land irrigated, the distribution system, number of outlets and amount of head, farmers must adhere to a rotating schedule that allows only a portion of the total outlets to be opened at any one time.

Five systems, to date, have been constructed using water that is pumped up from larger streams with diesel or electrical motors to areas that have been leveled to facilitate ditch-furrow distribution of water and, in some cases, sprinkler irrigation. Certainly, these are more costly to construct per unit of irrigated land, as well as being more complex and expensive to operate and maintain.

The technical quality of most of those systems observed is more than acceptable. Systems appear to have been well constructed and are operating as expected. Minor design and maintenance flaws (weak or unglued joints, lack of reinforcement and protection of valves and outlets, etc.) are gradually being resolved based on experience. It is also very gratifying to see that most of the nearly 40 systems constructed under HADS have concentrated on the most simple and readily available technology: gravity-fed pipe and sprinkler systems. These have been easily constructed and operated by participating farmers. Maintenance is relatively simple and straightforward and is readily carried out by farmers when they are properly oriented in maintenance procedures.

As proposed in the PP, farmers are organized into, or already pertain to, groups which formally solicit assistance from DIGESA to construct a system. DIGESA has the responsibility of design and supervision of construction, in the orientation of farmers in system operation and in the appropriate utilization of the system (including agricultural extension). The sequence of steps that DIGESA takes to arrive at a completed system is detailed below:

1. Location and reconnaissance of irrigable areas. This is usually based on a request by a group of farmers or is initiated by an extensionist, guia agricola or representante agropecuario who may detect the potential at the field level. The area is visited and, depending on the season (measurements must be taken in dry season), a water volume/velocity sample may be taken.
2. Feasibility study. To further refine the feasibility of a system, analyses of local climate, soil, socioeconomic and hydrologic factors are carried out. The site to be irrigated is subject to analysis of moisture budgets, percolation/irrigation rates and frequencies of water application.
3. Organization and promotion of farmers. Technicians explain the objectives of the project to the farmers, regulations regarding their participation in the project, responsibilities that each member of the group will have, advantages and disadvantages of irrigation systems, and the process of soliciting, receiving and repaying loans.
4. Topographic survey. Routes and hydraulic head are plotted at the field level. Land to be irrigated is surveyed. Farmers then get writs indicating they are permitted rights-of-way through others' land to route buried pipelines.
5. Calculation/design of project. All data are organized and analyzed. Technical specifications for materials, structures and location of infrastructure, and schematic drawings are prepared. A list of materials and equipment and a budget are then prepared.
6. Credit plan. A credit proposal is drawn up that includes the budget for materials, a justification of the project based on an economic analysis of crops to be produced (costs and value of produce sold), and the personal data on each member of the group (including proof that they do not already have delinquent loans with BANDESA). BANDESA agents arrive in community to collect necessary information on each participant.

7. Receipt of complete loan and approval. BANDESA receives a complete and correct loan proposal, reviews it and approves the loan for payment (some have been delayed, but none have been refused to date). The loan amounts are paid to: 1) the purveyors of materials as budgeted in the loan requests, or 2) the representative of the group (president, treasurer or designate), who receives the check in the name of the group and manages the money to purchase the supplies.
8. System construction. All members of the group participate in the construction of the system (digging ditches, laying pipe, constructing diversions, etc). DIGESA technicians supervise the construction.
9. Training of farmers in operation and maintenance of systems. A series of practical demonstrations is used to orient the farmers in the correct operation of the system and in important points of maintenance. DIGESA technicians closely supervise the first few weeks of system use to ensure correct operation and system integrity.

According to DIGESA field personnel, each project requires from 180 to 220 days to execute steps 1 through 9 even though numerous projects are in process at any one time. All DIGESA regional offices follow, to a certain degree, the process described above. There are obvious differences from one region to the next, in the quality of work and time needed for each step; this is explained by the level of experience and number of technicians in each region. There are differences in the quality of feasibility studies and economic analyses (see section on credit), and the time and effort given to the farmer-training and supervision phases are somewhat disparate. There are a number of deficiencies or "bottlenecks" in the process that are worthy of resolution to allow more efficient execution of HADS. These are discussed later in this section.

B. Soil Conservation

Activities of soil conservation, in the form of physical structures such as rock walls and bench terraces, have a tradition rooted in the Maya going back to the first century A.D. Recently, numerous GOG programs, supported by international donors, have given renewed emphasis to the construction of soil conservation structures as the most direct solution to the problem of the eroding soil resource as well as being of vital importance to the subsistence and macroeconomy of all Guatemalans. AID's support to this effort includes the Small Farmer Development, Small Farmer Diversification Systems and the Highlands Agricultural Development projects. Literally,

thousands of hectares have been protected with soil conservation structures throughout central and western Guatemala. HADS is making gradual progress toward achieving its goal of treating over 8,718 hectares of land on small, upland farms in the Western and Central Highlands and, more recently, eastern and southern Guatemala. To date, 2,765 hectares have been treated (32 percent of goal) with 7,558 beneficiaries utilizing social payments and another undetermined amount (more than 500 hectares) has been treated without social payments. According to the HADS PP (pp. 15-16), the soil conservation activities:

. . . will be carried out in close conjunction with small-scale irrigation activities, and where technically feasible, on the same farm lands. The structures may consist of any one of several designs. However, due to soil and water retention and soil slopes encountered, it is estimated that 70% of these devices constructed will be simple bench terraces. Other types of soil conservation structures constructed or practiced will be brush and rock dams, strip cropping or contour furrows. The type of soil conservation method used will be determined by the DIGESA extension agent and the local farmer.

DIGESA extension agents, in conjunction with locally trained area farmers or guías agrícolas (whose wages are paid by DIGESA), will be responsible for the site selection and construction of soil conservation structures (primarily bench terraces and contour rows). Thirty-six months of short- and long-term loan funded technical assistance will be provided to improve the agricultural extension abilities of the DIGESA employees and guías agrícolas. Using home-made leveling devices and hand tools, the interested farmers will work under the guidance of the extension agent to construct the soil conservation structure.

Social cost payments will be used only to introduce soil conservation practices in areas where they are not presently used. Interested farmers will be selected by DIGESA agents to receive payments and will be paid on a per unit of land improved basis, calculating approximately \$3.20 per day for their labor. BANDESA will participate as the financial agent for the social cost payments which will be approved by the DIGESA extension agent and which will be paid after the construction process.

The evaluation team found that soil conservation activities in all participating regions of DIGESA were well along their way in meeting or surpassing projected goals. Most of the structures constructed thus far are bench terraces because, as DIGESA personnel told the team, "they are the most efficient and acceptable to the farmers." Rock walls are more prevalent in Regions VI and VII where the abundance of rocks in farmers'

fields obstruct cultivation. Hillside ditches are used on gently sloping lands supposedly in relation to shallow soils. Recently, some pilot plots of greenbelts or live barriers (barreras vivas)--planting bunch grasses or shrubs on the contour--have been attempted in Regions I and V, but on a very limited scale. To some degree, land preparation techniques, such as contour furrows, have been promoted.

Instrumental to HADS' success in realizing such an abundance of soil conservation structures is the promotion of a strategy based, in part, on the social payments. Although the PP stated that under earlier AID-financed programs, nearly one-third of all hectares conserved were done without social payments, the team did not find more than a few isolated cases of this--usually in relation to land preparation for a high-yield crop (i.e., coffee). In Region I, where terracing has been promoted for more than 10 years, it is probable that non-financed terracing is occurring. In other regions, this did not seem to be the case. Social payments are based on schedules for each type of activity. In Region I, the following schedule is used:

<u>Activity</u>	<u>Unit Payment (Q)</u>
Contour furrowing	1.00 - 2.00/441 m ²
Hillside ditches	0.05 - 0.10/linear meter
Water regulation pits (with canals)	0.50 - 1.00/m ³
Rock walls	1.00 - 1.50/m ³
Bench terraces w/grassed banks	0.03 - 0.06/m ²
Gully plugs	
- w/posts or branches	0.50 - 1.00/linear meter
- w/rocks or vegetative residue	1.00 - 1.50/m ³

The above payments are used only as a general guide. Local DIGESA technicians decide actual amounts based on slope, soil conditions and the need of the farmer (poverty). Vegetative material for live barriers and grassed banks is provided by DIGESA but charged to social payment vouchers.

The step-by-step process for locating and constructing soil conservation structures is presented below. Again, DIGESA technicians decide how closely this procedure is followed. In theory, all these activities are based on an annual work plan that specifies hectare goals, indicates in which communities and with whom DIGESA will work, and includes a budget requesting funding levels for social payments.

1. Location and inspection of areas. Areas to be put under soil conservation structures are usually indicated by extensionists, guías agrícolas, representantes agropecuarios and sometimes the soil conservation

technicians, and includes determination and selection of appropriate structures.

2. Motivation, promotion and organization of farmers. Consists of a series of talks explaining the advantages of conservation and explaining the program and the social payments. If nearby, includes visits to farms where structures are in use. Farmers are organized in groups.
3. Training. Depending on the region, soil conservation technicians, extensionists, guías and/or representantes give practical training to farmers (in group) on how to construct the selected structure(s), assembling and use of the "A" level, and layout of structures.
4. Conservation plan. For each individual farmer or for the group (communal land), a determination is made of how much and which land will be treated (limit one hectare per farmer), when the work will be completed, and the amounts and arrangements for social payments.
5. Construction. Farmers are gently pushed to finish the agreed-upon construction during the period of time stipulated, although partial construction is paid over time (it may take farmers a year or more to finish one hectare given their other activities). Technicians, extensionists, guías and/or representantes supervise the quality of the work periodically.
6. Evaluation. DIGESA field personnel and the subregional supervisors evaluate whether the work has been completed in quantity and quality and then authorize payment. Payment orders are submitted to BANDESA for payment. BANDESA agents inspect the farmer's work to see if it is indeed finished.
7. Payment. Farmers are paid their accorde shares. Usually a check is made payable to the president of the group who then distributes payment. In many cases DIGESA technicians convince farmers to invest their payments in agricultural inputs for their treated lands (seed, fertilizer, equipment, tools, etc.).
8. Technical assistance. This is intended to take the form of follow-up agricultural extension and the most efficient utilization of the conservation structures. This activity falls to the extensionists and representantes agropecuarios who are normally assigned to assist groups.

In terms of the extent of construction of soil-conserving structures, DIGESA has been quite successful. The structures themselves are, by and large, well built and adequate for their intended purpose. Farmers are trained adequately and apparently are capable of constructing other structures with little or no supervision from DIGESA.

Structures observed by the evaluation team were deemed to be well designed and, in most cases, completed. Delays in receiving sufficient seeds and plant material of appropriate species, such as grass barriers, have meant that farmers' payments were delayed, or that the extensionists had to return to the farmers when the plant materials were finally available and retrain as well as supervise farmers in the planting of grass barriers. In one case, DIGESA waited nearly three years to receive grass seed that AID was supposed to procure in the United States, prompting DIGESA management to "draw a picture" so AID management would get the message (see Annex B). The social payment process has worked well with BANDESA. The only problems of coordination are explained in other sections of this report.

While the project's overall physical achievements in soil conservation are impressive, certain deficiencies were detected by the evaluation team, resolution of which, should make for more successful project implementation and a more effective soil conservation effort. These problems or deficiencies are detailed in Section III.C below, along with specific suggestions for their resolution.

C. Deficiencies in Small-Scale Irrigation and Soil Conservation Activities

Regardless of how well HADS has been implemented in the first half of its project life, certain deficiencies or obstacles have been detected by the evaluation team--many of which were described by DIGESA personnel. These have negatively affected project achievement of objectives and goals set out in the PP and ProAg in terms of time, quality and quantity. From a technical point of view, the techniques being promoted, for the most part, are sound and the quality of personnel working on the project is more than acceptable. Indeed the evaluation team found a high level of technical capability, enthusiasm and professionalism in nearly all persons connected with project execution, especially at the field level.

Deficiencies were detected primarily in relation to the process and organizational aspects of the project. While those deficiencies concerning field-level DIGESA activities are covered in this section, problems concerning BANDESA, management and coordination, as well as financial processes, are covered in other sections of this evaluation report. In the following

sections, areas of principal concern are discussed and project deficiencies detailed. Following each description is a series of recommendations oriented toward resolving these deficiencies and directing the project on a more efficient course of implementation.

It should also be pointed out that the project area is not homogeneous in either agro-ecologic conditions or socio-traditional farming systems. MAGA's regions have differing climatic, soil and elevation regimes, and traditions in cropping systems vary accordingly. This "regionalism" must be considered in the planning and execution of HADS.

1. Arbitrary Selection of Priority Work Sites and Beneficiaries

To date, HADS has been promoted by word of mouth and, to a certain extent, empirically by local agricultural extensionists, guias agricolas and representantes agropecuarios. While this in itself is not necessarily a bad methodology for locating potentially irrigable land or interested beneficiaries, it has led to the location and construction of several irrigation systems in areas which are inappropriate because of:

- problems of access (moving produce to market);
- irrigation is not an expressed need of the community (because climatic conditions can support agriculture during 10 or more months a year); or
- because beneficiaries have no experience and/or interest in diversification of their cropping systems.

While soil conservation strategies are needed virtually throughout the six HADS regions because of the topography and abusive, non-sustainable land-use practices, a lack of systematic selection of priority areas for soil conservation has led to a somewhat dispersed distribution of such structures with minimal relation to watershed protection or the enhancement of other on-farm infrastructure (especially irrigation systems). *

The evaluation team observed several cases where small-scale irrigation systems were constructed far away from a road or perennial access. When diversified production significantly increases levels of traditional crops, an obvious farm-to-market transport problem will arise. In areas where HADS is expanding (Regions II, IV, VI and VII), the evaluation team recognized that several farmers either had no intention of diversifying their agriculture with irrigation (they wanted to improve production of basic grains) or were only reluctantly diversifying, since they

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had no experience in diversified agriculture (i.e., vegetables). Lastly, several regions within the expanded project area are not really in need of irrigation, especially the northern parts of Regions I, II and VII where there is only a minor impact from the dry season and total annual rainfall is plentiful (see Figures 2 and 3). While there may be a need for some supplemental irrigation in these areas, the economic justification of constructing irrigation systems must be questioned. On the other hand, where annual precipitation levels and the length of the dry season limit successful agricultural production, the dependability of a water source selected for an irrigation system is of dire importance. The precipitation and hydrologic data for these water sources and their tributary watersheds are very poor and, in some cases, measurement of water flows may prove to be deficient in later years.

The existence of a sufficiently dependable water source has been the principal determinant of whether a system will be constructed. Water sources are located from two to 10 kilometers from the site of the lands to be irrigated, thereby resulting in a wide variation in costs. Some conflicts have also arisen in gaining rights to use the water sources (absence of appropriate water laws) and rights-of-way for routing pipelines.

*

The promotion, design and construction of the larger irrigation systems (especially in Regions I and V) of an irrigated area greater than 40 hectares is a large undertaking which requires a great deal of technical assistance from DIGESA's technicians. These projects can be compared to DIGESA's irrigation districts in Region IV and VII, in which large-scale commercial operations are run by private firms and cooperatives. The Cuatro Pinos and Rincón Grande cooperatives fit into this category. These systems are seen by the evaluation team as inappropriate to the objectives and spirit of small-scale irrigation as conceived by project designers. HADS and DIGESA technicians' time is directed, too much in many cases, toward these larger projects that allow project goals to be more easily achieved--all at the cost of delaying the numerous smaller irrigation projects solicited by farmers.

Where irrigated, diversified agriculture has been practiced for many years (Regions I and V), promotion to potential beneficiaries is hardly needed; these farmers know the value of an irrigation system and are more easily organized to participate in its realization. In other regions (II, IV, VI and VII), there has been limited or no localized experience with irrigated agriculture in the targeted areas. This factor alone requires a completely different promotional approach, involving consciousness-raising and education on the numerous aspects of operation, maintenance and successful utilization of a small-scale irrigation system.

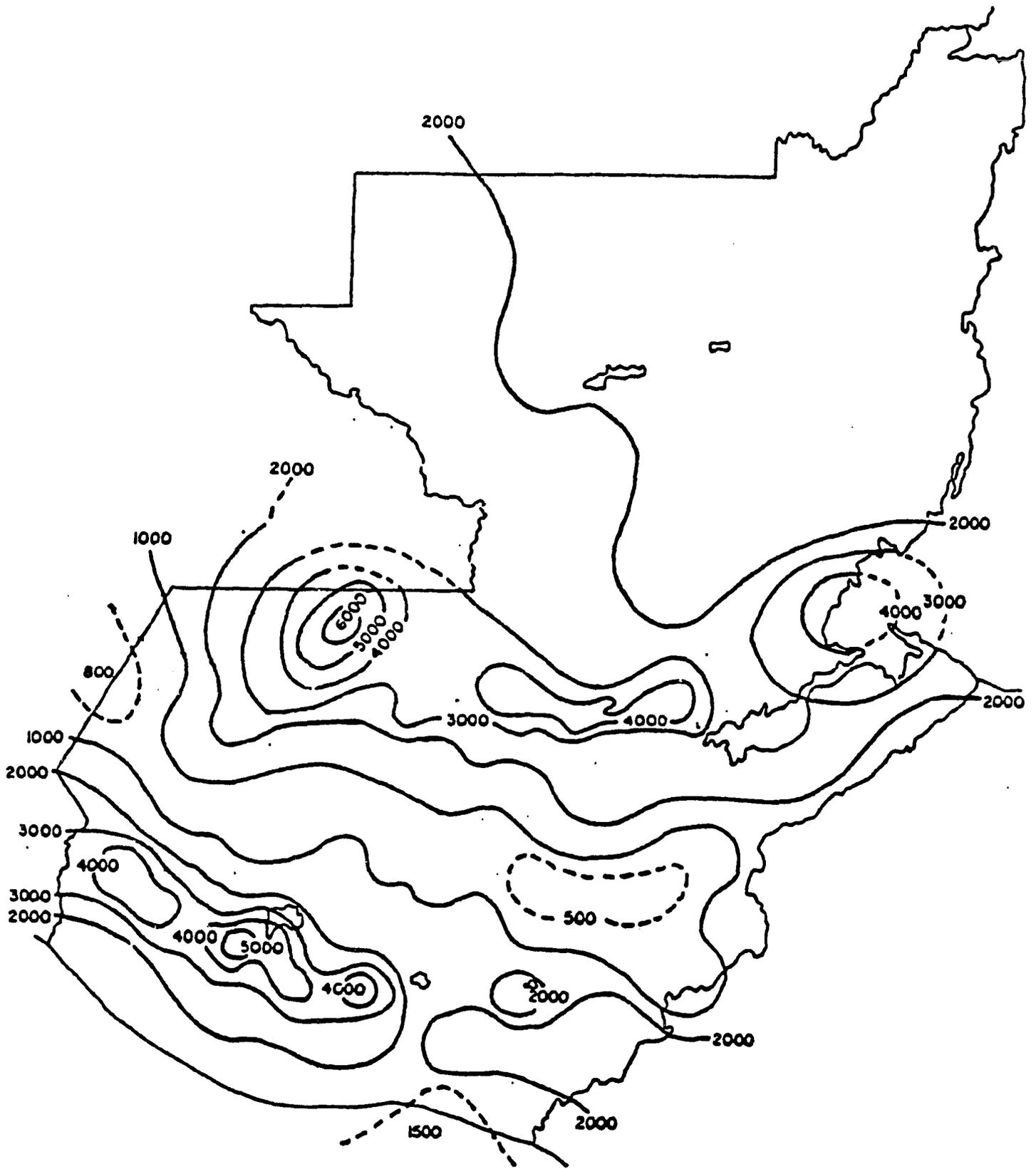


Figure 2. Distribution of Annual Rainfall in Millimeters
 (Source: Atlas Geografico de Guatemala, 1985)

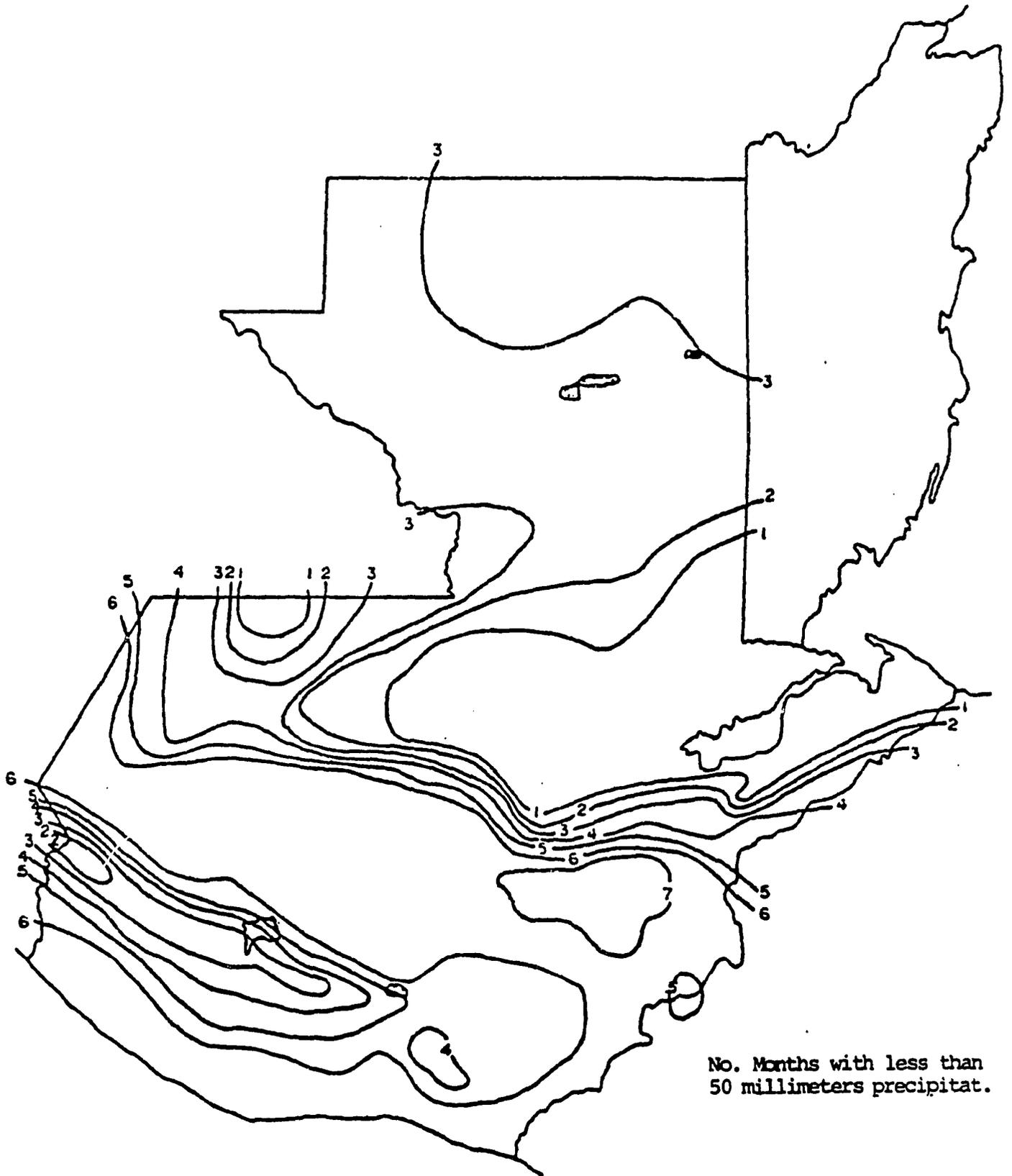


Figure 3. Distribution of Dry Season in Guatemala
 (Source: Dulin, 1982)

By the same token, soil conservation structures have been promoted, in many cases, as a project separate from small-scale irrigation activities. The evaluation team found isolated cases of soil conservation structures in combination with irrigation projects--however this, was not the norm.

Also, the absence of an appropriate system for the selection of priority areas for soil conservation, along with appropriate strategies for these areas, while not critical to reaching physical and human outreach goals, does lead to the question of why certain areas were selected while others in greater need of treatment were not (e.g., to protect water resources, or areas where soil erosion levels are thresholds higher than those now covered with terraces). Just as terrace building starts at the top of a land parcel and descends gradually in order to protect the land immediately down-slope, so too should the selection of areas be oriented first toward the protection/rehabilitation lands which imperil those down-slope. While this is not a hard-and-fast rule, it should at least enter into the criteria for selection of lands to be conserved, along with other factors (access, interest and/or need of the community, etc.). *

Recommendations

DIGESA should develop a geographic and socioeconomic data base as a basis for the systematic selection of appropriate water sources, irrigation system location and design, priority areas for soil conservation, and project beneficiaries. The system will be map-based and consist of two levels of selection criteria: 1) inventory of physical resources, and 2) characterization of local socioeconomic conditions. Aspects of the two levels are presented below.

Inventory of Physical Resources

- First, DIGESA, in coordination with the National Institute for Seismology, Vulcanology, Meteorology and Hydrology (INSIVUMEH), should do a simple inventory of hydraulic resources based on topography, geology and precipitation data. Aerial photos could be used to pinpoint the locations of surface water sources (known or potential), including springs, streams and rivers. A quotient would be assigned each water source (i.e., ephemeral, intermittent or perennial), based on parameters of length of dry season, annual precipitation, topography and elevation, and sources would be plotted on 1:50,000 topographic maps.

- Second, at the same time, important cultural features would be updated on the 1:50,000 topographic maps--especially settlements and access roads. Land-use maps should be prepared (if not already available) using aerial photography, pre-interpreted satellite imagery* and existing forest inventory maps from INAFOR. These land-use maps should be elaborated at a scale of 1:50,000 first, for areas within those regions already indicated for priority project coverage (i.e., for political reasons or based on location and availability of DIGESA field personnel/agencies), and second, for other areas that are potentially appropriate for project development.

- Third, for existing and future small-scale irrigation projects, inexpensive, plastic pluviometers (cost US\$7.00 each) should be installed within or near the tributary watersheds or at the irrigation diversions, and data taken by members of each irrigation project as a part of their maintenance duties. These data will refine available meteorologic data for mountainous areas for which little or no information exists; data will be reintegrated in the data base (see first recommendation).

- Fourth, a slope map should be prepared based on the 1:50,000 topographic maps with slope-percent classes of: 0-5, 6-15, 16-35, 36-50 and >50. The slope map will be used to indicate areas with potential for irrigation as well as a simple and effective indicator of land capability. Priority areas for soil conservation could then be indicated on the basis of comparing slope (land capability) to current land use. Areas where land use is outside the capability of land (i.e., agriculture on slopes of 16 percent or greater) would have priority for soil conservation strategies, forest protection (slopes >50), etc.

*Because of the mountainous character of the project area and the permeance of small, undifferentiated plots of land use, reliance on satellite imagery alone for an accurate and worthwhile land-use survey is dubious, especially in terms of scale and resolution.

Characterization of Local Socioeconomic Conditions

- First, at the extension agency level, extensionists, guías agrícolas and representantes agropecuarios will do a characterization of the villages/communities within their work areas (by municipality). The characterization will be of simple format design, consisting of maps of village location and morphology (number and location of families), basic information on soils, meteorologic information, farming systems, technology level of local farmers, erosion problems, cropping and consumption patterns, traditional and potential markets, existence of farmer or communal organizations and a description of any program of technical assistance, whether by DIGESA, other GOG organizations or any other national or international organizations (CARE, COGAAT, Plan Foster, etc.). Data collection is based on observation and informal interviews with village leaders and teachers, and on the knowledge of extensionists, guías and representantes. It is not based on formal socioeconomic (house to house) surveys.
- Second, at the same time the characterization is being developed, certain problems and needs will emerge, as observed by DIGESA personnel or expressed by members of the community. In as much as these deal with the local use and management of natural resources (agricultural problems, decreasing yields, droughts, etc.), extensionists will highlight this information in order to prioritize strategies for technical assistance (especially in the case of soil conservation, agricultural extension and the potential for irrigation).

As described above, the inventory of physical resources should be carried out by DIGESA irrigation technicians in each participating region. The evaluation team found that these technicians have a good deal of available time (especially during the rainy season) and could dedicate this time to inventory activities. The "Area Integrada" program at the University of San Carlos (USAC) could provide technical assistance in collection and analysis of meteorologic and land-use information, aerial photography interpretation and ground truthing, elaboration of slope maps, and overall map preparation.

A watershed management specialist should be hired to provide the technical assistance necessary to develop the physical resources inventory, characterizations of local socioeconomic conditions and a system for selecting priority areas for small-scale irrigation and soil conservation activities. This

specialist would also be instrumental in developing a decentralized, integrated planning scheme for extension agencies (see Section III.C.2 below). The specialist would be assigned to DIGESA's Unidad Coordinadora de Proyectos y Convenios (UCPC).

As part of USAC's "Ejercicio Profesional Supervisado," students could participate directly with extensionists, guías and representantes at the field level in the preparation of characterizations of the agencies' work areas and preparation of short- and medium-term agency work strategies. As information unfolds, DIGESA will indicate, in order of priority, the location of appropriate water resources which could be made available for small-scale irrigation projects. Priorities should then be based on accessibility of lands to be irrigated, then on information available at the field level generated by the characterization. In absence of a characterization, irrigation technicians and/or university students must then rely on discussions with extensionists, guías and representantes and their knowledge of local socioeconomic and physical resource conditions--using the characterization format as a basis.

A computerized information management system should be developed to process, analyze and maintain tabular data generated by the characterizations and other data basic to the selection of priority project activity areas (e.g., meteorologic, hydrographic, agricultural production and income, farm budgets, etc.). A full-time information management specialist should be hired under HADS to provide technical assistance in developing databases and programmatic software and to train computer operators and potential users of the system. This system should not include the development of a geographic information system (GIS), as such a system is not appropriate in the context of this project.

HADS should cede the design, construction and supervision of irrigation projects larger than 40 hectares to the private sector. The costs of this technical assistance should be borne by the cooperatives or commercial interests soliciting the system, through the same infrastructural credit line. While this augments the cost of the system and the amount of the loan to the beneficiaries (DIGESA subsidizes irrigation projects by providing technical assistance), it brings the true costs in line with reality. HADS trust fund can still make low-cost, soft-term loans available to these ventures. Private firms could bid on

*The GIS has limited applicability in the context of HADS and in Guatemala. Such a system is a tertiary-level geographic tool of expensive technology that can not yet be used effectively in this development context. Firsthand land inspection, air photo analysis and ground truthing are considered as more appropriate methodologies.

projects identified by DIGESA. AID can use a contracting process similar to that used for road building contractors or could assist cooperatives in contracting the firms.

Finally, HADS should remove the small-scale irrigation component from Region II (Cobán). * Observations have shown that this region has good, fairly dependable rainfall and a short dry season, which results in good production levels of traditional crops and could support selected alternative crops without irrigation infrastructure. The few systems built there plus the low solicitation rate for irrigation systems does not warrant the costly technical staff currently in residence. This staff should be transferred to other regions where their services could be better utilized. Also, irrigation projects should not be promoted or built in the northern areas of Region I and VII where similarly favorable meteorological conditions do not warrant them. These areas then, should be "off limits" to HADS unless eventually justified by data generated through the system for selecting priority areas.

2. Inefficient Extension Follow-up on Soil Conservation and Small-Scale Irrigation Projects

If the technology transferred to participating farmers is to be fully assimilated by them, the technology must, to the extent possible, be integrated into their current farming systems. While the changes brought about by diversified agriculture certainly has an impact on traditional farming practices, these impacts can be ameliorated if and when technology transfer includes an appropriate follow-up extension strategy. HADS' field execution organization, DIGESA, is doing a fairly good job in promoting irrigation and soil conservation, but follow-up extension on taking full advantage of these techniques has been grossly lacking, with only a few positive cases observed by the evaluation team. It was not uncommon to find large expanses of bench terraces and hillside ditches where traditional maize and beans, and even vegetables, were being planted in an inefficient manner without incorporating other conservationist agronomic practices.

In various small-scale irrigation projects, land was lacking soil conservation treatments and rows of vegetables were oriented parallel to the slope instead of on the contour. It is also important to bear in mind that terrace construction requires removal, disruption and mixing of the soil. This (as verified with DIGESA technicians) reduces yields until soil structure is reestablished (usually after two years). Without complementary agronomic practices, the loss in yield can be devastating for participating farmers resulting in their disaffection for the technology.

Where farmers have a tradition of growing vegetables (Regions I and V), the lack of agricultural extension is not a fatal flaw. Vegetable producers have experience in selecting varieties of seed which produce the best crop, know how and when to fertilize, and have familiarity with many of the recurring diseases and pests as well as with the agri-chemicals used to control them. In areas where knowledge of crop diversification is not widespread (Regions II, IV, VI and VII), the lack of follow-up extension in the form of technical assistance and training can result in very serious and costly mistakes in crop selection, management and the handling and marketing of harvests. Numerous reasons have been cited for DIGESA's lack of follow-up extension on soil conservation structures and small-scale irrigation projects:

- promotion of incomplete or inappropriate technical packages that have not been researched based on local agro-ecologic and socioeconomic conditions, local consumption patterns and preferences, markets and prices, and the experience of farmers;
- lack of practical training of DIGESA extensionists, guías agrícolas and representantes agropecuarios, which in turn leads to the lack of practical training of farmers--indeed the only formal training sponsored by HADS has been that of sending DIGESA regional-office technicians to Mexico and the United States for technical short courses (see Annex E);
- lack of supervision of DIGESA agencies in order to control the quality and quantity of work, and confusing institutional organization and planning activities at the DIGESA agency level (see also Section V on Organizational Structure, Management and Coordination);
- lack of good scientific data on application rates of irrigation waters for each crop for differing agro-ecologic zones;
- lack of sufficient human and logistical resources at the subregional and agency levels;
- lack of agricultural inputs (seed, fertilizer, pesticides, basic tools and equipment) immediately available to farmers to apply to newly irrigated and/or conservation-treated land;
- communication problems, because of language barriers between DIGESA technicians and extension agents (almost all are ladinos with only Spanish-speaking ability) and the target population, especially in

Regions I, II and V, where Quiché, Kekchí, Mam and/or Cakchiquel are spoken;

- technical assistance to improve production of traditional crops is left out of extension effort in various agencies in favor of diversification; and
- lack of use or inappropriate application of existing promotion and extension materials.

Recommendations

Very definitely, DIGESA should improve its efficiency in providing follow-up agricultural extension to those farmers constructing soil conservation structures and small-scale irrigation infrastructure through the following actions:

- An assessment should be conducted to determine personnel needs and related logistical support to extension agencies participating in HADS. The project should provide funds for employing additional extensionists/agronomists at the agency level and/or representantes agropecuarios in selected targeted communities, giving preference, where applicable, to candidates with Indian language capability.
- DIGESA should prepare practical training modules for extensionists, guías and representantes that cover the voids in the current extension outreach (i.e., vegetable-specific management packages, maintenance and repair of irrigation infrastructure, production-improvement packages for traditional crops, etc.). Any and all training should be supplied with appropriate technical reference material, similar to that produced under Small Farmer Diversification Systems with DIGESA and EAT/USDA. Training should also focus on the appropriate use of promotion and extension materials using these materials as part of the curricula (materials prepared by EAT/USDA, Educación Extra-Escolar, Superb, the agricultural supplies company, etc.). An agricultural extension/training specialist should be contracted to provide necessary technical assistance in order to develop an appropriate extension program and design and implement a training program.
- Based on the characterization of the extension agencies (see III.C.1 above), the criteria for selection and mix of appropriate crops (traditional and diversified) to be produced on irrigated and/or

soil conservation treated land should be reviewed. As part of this effort, students of the Ejercicio Profesional Supervisado should live in selected communities of the regions and prepare farm-level budgets/plans based on modules that are already working well. USAC students should locate technologically advanced farmers with experience for each crop or crop mix and, through extended observation, devise successful modules for each mix. These modules should be based on a predetermined format to be developed by DIGESA, ICTA and USAC. Not only will these modules provide the appropriate technical information needed for extension strategies, they will also generate costs and income baselines that can be used to evaluate the overall efficacy of project interventions.

- The use of social payments to purchase agricultural inputs for use on conservation-treated lands should be promoted. This is already being done in isolated cases throughout each Region. The inputs purchased can then be used as the basis for extension and training on the treated lands. DIGESA should evaluate the feasibility to use in-kind social payments of agricultural inputs in lieu of cash, or their combination. A schedule of prices of the different agricultural inputs would be maintained by DIGESA and casas comerciales. Groups could be assigned credit to purchase inputs in amounts determined by the value of soil conservation work done.
- DIGESA should make the application of soil conservation measures a condition to receive irrigation infrastructure loans. The construction of physical structures should be compensated in kind with agricultural inputs that will be applied on the first cropping cycle. The possibility of their construction without social payments, whether in cash or kind, should be considered, especially in areas where terracing is more accepted by farmers..

3. Overemphasis on Bench Terraces, Lack of Maintenance and Failure to Incorporate Conservationist Agronomic Practices

HADS can be called a "terracing project." The levels of conversion of eroding hillside lands to terraced, soil-conserving lands are very impressive. The zeal to meet or surpass physical goals for treated hectares, however, has led to several deficiencies which threaten to come back and haunt both the

farmers who are building them and the DIGESA technicians who are promoting them. Coupled with the problems mentioned in III.C.2 above, the promotion of incomplete technical packages can be a dangerous venture for sustainable agricultural systems on upland farms in Guatemala. Terraces are without much medium- to long-term merit unless: 1) they are maintained, and 2) a complete soil conservation package of appropriate agronomic practices is applied. It should also be emphasized that any technical assistance provided to farmers by extensionists, guías and representantes focus on the integrated farm, not just "stock" vegetable crops under diversification programs. The evaluation team observed various cases where traditional crops on terraces, on lands under irrigation or on lands right next to treated or irrigated lands were being inefficiently cultivated with no "technification" whatsoever (i.e., maize planted in traditional mounds with five plants grouped in each).

Although not observed by the evaluation team, DIGESA technicians and extensionists expressed frustration that many farmers were not giving conservation structures the maintenance they needed. This was explained, partially, by the fact that DIGESA neglected to provide practical orientation and consciousness-raising on the need of maintaining the integrity of the structures. Nevertheless, the most conspicuous deficiency observed on terraced lands was the absence of sufficient land preparation and agronomic practices to warrant true soil conservation (contour furrowing, plant distribution, organic fertilizers, etc.).

Finally, DIGESA has concentrated its attention on bench terraces as the most appropriate soil conservation structure (no matter what is being produced) with minimal regard, in many cases, to local soil and precipitation regimes. Bench terraces are extremely expensive and labor-intensive structures to build and maintain. While their construction for producing vegetables, whether rainfed or irrigated, may be justifiable, their cost-effectiveness in relation to most traditional rainfed crops is questionable. In the latter, hillside ditches and narrow contour terraces, built at intervals of from five to 12 meters between structures, are arguably as efficient as bench terraces in reducing soil erosion and increasing infiltration of water. Greenbelts or live barriers of selected grasses and/or shrubs planted on the contour are being experimented with in different regions. These are inexpensive and, after their gradual establishment, create an "erosion-built" terrace. Furthermore, these can produce additional benefits of fodder and green manure, depending on the species chosen.

Recommendations

DIGESA should begin immediately to refocus attention on what constitutes a real soil conservation technological package. This, in turn, should be consolidated with its overall agricultural extension approach (see III.C.2 above). Aspects of this comprehensive soil conservation package are described below:

- DIGESA should broaden its conservation-structure selection criteria to include a more practical approach to the intended land use. Where traditional row crops will be cultivated, more consideration should be given to hillside ditches (zanjas de ladera), live barriers and narrow terraces (terrazas angostas) at appropriate spacing depending on severity of slope.
- On all lands where conservation structures will be constructed, appropriate agronomic and land preparation techniques should be promoted, including contour furrowing, minimum tillage, improved planting densities and seed distribution, organic fertilizers, green manuring, alley cropping, crop rotations, relays, intercropping and multistory cropping (i.e., with permanent crops).
- DIGESA, together with INAFOR and possibly ICTA, should identify promising species of grasses, multipurpose trees and shrubs (Pennisetum, Cajanus, Alnus, etc.) for different elevations and soil conditions and establish pilot agroforestry and alley-cropping modules. Green-manuring species, such as Dolicha, Canavalia, Cajanus, Gliricida, etc., should also be examined for incorporation in these modules.
- DIGESA should not abandon agricultural extension on untreated lands; rather, agronomic practices should be promoted on these until, in theory, these lands are brought under the more comprehensive soil conservation measures described above.
- Training modules based on the comprehensive soil conservation package should be prepared and delivered to DIGESA technicians, extensionists, guias and representantes, and combined with that effort described in III.C.2 above.
- It was noted that social payments are permitted for farmers practicing contour furrowing. This should stop immediately since contour furrowing should be considered a land preparation practice that is a

normal and integrated part of the planting cycle. Farmers may expend some extra energy in contour furrowing, but its benefits are near immediate in increasing water infiltration and aeration to the soil.

4. Inefficient and Costly Staffing Arrangements at Regional and Subregional Offices

The evaluation team observed the inefficient use of human resources assigned to the project in various regions. Because of the nature of the irrigation projects as currently organized, most of the work occupying the time of the irrigation technicians (design and construction) is concentrated in the dry months (October to April), and leaves them somewhat "loose" during the other months of the year, other than occasional supervisory and troubleshooting visits to projects already in operation. In Region II, small-scale irrigation activity levels are so low, technicians are essentially unoccupied.

In the regional offices where topographic teams have been assigned under HADS, their time is occupied, again, primarily during the dry season, leaving them fairly unoccupied during the rest of the year. Several regional offices have hired full-time masons (albañiles) to construct diversion structures, regulation tanks, main valve boxes, etc. Again, more often than not, they are without work.

In at least one region it was observed that participant farmers were not being trained in basic troubleshooting, maintenance and repair of their irrigation systems. This means that when a small crack, break or leak is found anywhere in the system or the sprinkler heads become clogged, etc., the farmer must turn the system off, go to the regional or subregional office to seek out the irrigation technician, then wait for him to come out and repair the system. Lost irrigation time could cause crop damage or loss, depending on how fast the technician responds.

Various groups of farmers (especially in Regions I and V) are operating their irrigation projects efficiently and have a demonstrated capability in the production of non-traditional crops. It is illogical that DIGESA continue anything more than extensive assistance to these groups. DIGESA technicians and extensionists are trying to maintain assistance to too many groups and individuals at the same time, thus the quality of assistance is diluted and sporadic. *

Recommendations

To take better advantage of existing human resources and arrive at more cost-effective staffing arrangements for DIGESA under HADS, the evaluation team suggests the following:

- Irrigation technicians at the regional and subregional level should be involved in the physical resources inventory to detect potentially promising water sources, the location of irrigable lands and priority areas for promoting small-scale irrigation projects (see III.C.1 above). This will bring about a more orderly approach to site selection for potential projects, allow the technicians to better schedule their site investigations, design and construction activities, bring about better knowledge of their work areas, and distribute their work more evenly throughout the year.
- An assessment should be made as to whether or not topographic teams should remain on the DIGESA payroll*. The evaluation team suggests that topographic surveys be carried out by the private sector on an as-needed basis. DIGESA could compete open contracts for several topographic survey firms, or it could hire individuals who are fully qualified to carry out the work with DIGESA irrigation technicians charged with their supervision.
- DIGESA should not have full-time masons on staff unless only one would be retained in regions where a substantial amount of work is performed. In these cases, the mason should be retained only as a trainer of farmers who could, in turn, carry out needed masonry work. Otherwise, DIGESA should seek to utilize local masons in communities where the systems will be constructed, hiring them on a job basis.
- DIGESA should make it mandatory that a minimum of two members in each irrigation group be trained in techniques of troubleshooting, maintenance and basic repair of the irrigation system and infrastructure. Basic tools and supplies (glue, replacement tube, parts for sprinkler heads) should be provided as part of the training.

*This does not include topographic teams who may be assigned to irrigation districts (distritos de riego).

- The irrigation technicians in Region II (Cobán) should be removed and reassigned to regions where their services can be better utilized.
- As mentioned in III.C.1 above, the design and construction of larger irrigation systems (>40 hectares) should be done by the private sector, thus leaving the HADS technicians to concentrate on true small-scale irrigation projects.
- DIGESA technicians and extensionists should do a rapid determination of which farmer groups are essentially self-sufficient and should "liberate" them from continued technical assistance.

IV. CREDIT AND SOCIAL PAYMENTS

As envisioned in the HADS PP, a trust fund (fideicomiso) was established in BANDESA as a basis for extending small-scale irrigation infrastructure loans to farmers in the project's targeted regions. While AID has made a total of US\$2,413,667 (original ProAg plus amendments) available for this project activity, only approximately US\$423,664 will be disbursed by the end of 1987 (see discussion concerning expenditures in Section II). In another activity under the trust fund, AID has appropriated a total of US\$2,754,857 to be used for social payments to farmers for their labor in constructing soil conservation structures on individual or communal lands. By the end of 1987, only about US\$451,185 will have been disbursed.*

BANDESA serves as the manager of HADS funds allocated for these long-term infrastructure loans and social payments under a trust agreement which spells out responsibilities and conditions. BANDESA is compensated for its work by being allowed to retain the interest income on project loans and a five percent commission based on the total of social payments disbursed. In both cases, loans and social payments, BANDESA uses its own funds and then later obtains reimbursement from the Treasury of Guatemala, which is then reimbursed by AID. As loans are repaid, their funds are made available for making new loans and social payments.

A. The Credit Process

Loans are made available on soft terms. While interest rates are currently at 10 percent, the project was initiated in 1983 with a six percent interest rate, which has gradually risen to its current level. Credit limits of Q5,000 per farmer and Q100,000 per group were established when the project was initiated. Because of inflation and the devaluation of the quetzal, these limits were increased in 1987 to Q15,000 and Q300,000, respectively. The credit terms are summarized below:

- 10 percent annual interest;
- annual principal payments;
- 15-year maximum term;
- maximum two-year grace period on principal;

*Does not include GOG counterpart contributions to the same funds; these figures were not available to the evaluation team.

- maximum two-year grace period on interest in special cases of financial incapacity; and
- guarantees of mortgages, crop liens, group guarantees, other liens, and other guarantees may all be used.

On project loans BANDESA charges 10 percent, while on its own crop loans it charges 14 percent. This relationship is not logical but results from differing trust agreements with IDB, AID and others who want to provide low-cost credit to specific targets. BANDESA provides loans at 12 percent for livestock producers. Private banks charge a nominal 14 percent interest rate for agricultural loans, but have methods of increasing the real rate.

As described in Section III, DIGESA has the responsibility to promote small-scale irrigation systems to farmers, prepare design and economic feasibility studies, organize participants into groups, and prepare a list of potential participants for each irrigation project. DIGESA sends the list of participants to BANDESA to determine their eligibility to solicit credit under BANDESA's provisions (i.e., to detect any potential borrowers who are already delinquent with the bank) and to review each participant's land tenure status (proof of possession, status as renter or as landowner). While delinquents are not eligible, BANDESA will accept as a substitute participant a family member of an existing delinquent if that relative has no negative loan repayment record or has never received credit. Also, when the amount of the project exceeds the limit which can be approved at an agency, in most cases, the original group is subdivided into two or more groups to avoid the delay caused by having to send the request to the central office of BANDESA.

HADS employs an efficient method of lending to individuals, but only if they are affiliated within a group structure. The group can be considered semiformal (not necessarily a legally recognized entity with a charter), or it may be made up of cooperatives or pre-cooperatives with legal status. Group size ranges from a low of seven participants in Santa Catarina, Ixtahuacán, to a high of 112 participants in Zunil (both projects in Region I). Each individual signs the note or uses a thumbprint. The proportional debt is determined in most cases by the number of sprinkler outlets on the farmer's land. This is more efficient than basing the share of debt on exact land measurement and represents the kind of practical response to problems in use at both BANDESA and DIGESA.

BANDESA's credit agent visits the group of individuals in their community on an appointed day and reviews each one's individual status, identity (número de identidad), and, in the presence (usually) of the DIGESA technician, reviews the terms of

the credit policy, payment amounts and schedule of payments (interest and principal). This is usually the last chance for farmers to withdraw from the project (i.e., for fear of their capacity to repay the debt)--a right which a fair number of original participants exercised in various projects in all regions.

With all needed forms filled out and required documents submitted, BANDESA reviews the credit in terms of amount and feasibility, materials budget and construction plan, then verifies the financial integrity of the project based on economic analysis (costs versus net income) of the crop production plan. This satisfied, the loan is approved and payment is disbursed. Disbursement is made directly to the firms that have open-ended contracts to provide materials to the groups for construction of the irrigation system, or payment is made to the group representative. The representative then accompanies the groups' treasurer or president to go to the firms to purchase materials. BANDESA usually collects interest and principal through the same representative who collects the proportioned payments due from each group member. However, BANDESA can go to each individual borrower if required. While one group account card is maintained for each project loan, an individual's record of payments due and paid is maintained on an accompanying sheet which includes all the participants in each small-scale irrigation project.

BANDESA agents make periodic visits to each project site to see that the project infrastructure is being utilized and maintained in accordance with the loan agreement. These visits are also made in connection with collection dates. Payments are made at BANDESA's numerous agencies by a group representative or, on rare occasions, by a DIGESA or BANDESA agent in areas distant from one of the agencies. Payments can be semiannual or annual, at the discretion of BANDESA and DIGESA in different regions.

Section II presents loan disbursements to date by region. Due to the two-year grace period used in various regions, only loans made prior to November 1985 are due, and meaningful recuperation rates cannot be calculated. However, using as an example the interest payments made in BANDESA's Quezaltenango agency in Region I (which stipulates semiannual interest payments), about 50 percent of the payments due had not been collected. On the other hand, some farmers in Region I had paid off their entire loans (which were written for 10 years) in two years, and others were several years ahead in their principal payments. This was also true in other regions and shows both the farmers' preoccupation with having a debt hanging over them as well as the profitability of small-scale irrigation.

B. Social Payments for Construction of Soil Conservation Structures

As with the credit process, BANDESA is dependent on DIGESA to generate the basic paperwork for authorization and disbursement of social payments to farmers for their construction of soil conservation works (see Section III.B below concerning payment procedures). DIGESA promotes the techniques, trains farmers and keeps records to produce a payment schedule (planilla). DIGESA technicians send BANDESA a projected budget based on its work plan for the coming year; the plan details the communities, individuals and how much land will be treated during the coming year, and specifies the social payments required to meet annual soil conservation goals.

Once soil conservation structures are completed by farmer participants, DIGESA sends a pay order to BANDESA, whose agents visit the farmers (or a random sample) to verify that the structures are indeed completed in the quantities (hectares or cuerdas) specified. Thus qualified, BANDESA then disburses payment to the group representative when s/he is accompanied by the treasurer and/or president of the group. Payment is then distributed according to the planilla.

BANDESA only acts as a facilitator of funds for social payments. According to the fideicomiso, the GOG is obligated to provide BANDESA a five percent commission on the total value of social payments processed--this payment for services rendered is to help cover overhead. In a fashion similar to loan funds, BANDESA uses its own bank funds to initiate social payments, then is reimbursed by the GOG treasury, which is then reimbursed by AID.

C. Deficiencies in Credit and Social Payment Processes

First, it should be pointed out that the evaluation team found that BANDESA has a high-quality human resource base. For several years, the bank has used a process of internal analysis by its own staff that involves various management levels. Problems and their causes are identified, solutions are proposed, and many are actually implemented. The results are formalized in written reports that are distributed to agencies and read and discussed at that level.

Field visits indicate that BANDESA has few problems in the management of this project. Agency heads, managers of credit agents, credit agents and credit analysts have good knowledge of project aims. If anything, their desire not to violate the terms of the agreements, and their understanding of the importance to the borrower of irrigation systems and crop diversification, have led to their acceptance of all projects presented to the bank to

date. Not all agencies were aware that the interest belongs to BANDESA. In addition, loan terms ranged from five to 15 years, some interest periods were semiannual and others annual, and the grace periods varied. This diversity among regions and agencies can be seen as a good way to react to local conditions and needs, but now is the time to standardize procedures through the establishment of effective models based on the most positive experiences to date. *

BANDESA has, in most cases, responded rapidly to each irrigation loan requested. The true obstacle to making more irrigation loans is the lack of projects submitted. All other bottlenecks have been of minor significance to project implementation and most have been overcome. For example, credit limits that can be approved for agencies have been raised, legalization can be done locally, borrowers need not be owners or renters, and exemption from taxes (stamps and use of official paper) has been obtained (see Annex C). BANDESA and DIGESA have also had differences of opinion about what constitutes a valid economic analysis (Region II), but this is not the general case. *

There are several deficiencies inherent to project implementation, resolution of which should help streamline the credit and social payment process and make for a more sound development bank. In most cases, these deficiencies have been under study by the bank, DIGESA and AID's project management for some time--many are treated in AID's draft Amendment 4. In the following subsections, the evaluation team describes deficiencies and offers recommendations for their solution.

1. BANDESA's Illiquid Financial Situation

The 1986 annual report has not yet been finalized. Balance sheets, income statements, delinquency reports, and cash flow reports as of 30 September 1987 were promised but not received. However, as reported by Ladman and Torrico (1984, p. 49): ". . . trust funds were virtually the only source of loanable funds available to the Bank because of the financial difficulties that have debilitated BANDESA's own funds." This situation has not changed. Inflation in 1985 and 1986 has, if anything, made the situation worse.

Some point to the approximately Q60 million in savings deposits which have been mobilized as proof that liquidity does exist for farm lending. However, this is not the case, for three reasons:

- Thirteen percent of saving deposits must be placed in reserves at the central bank; 41 percent of the total is applied to demand deposits.

- Sound banking principals involve the "matching" of sources and uses of funds by maturities. Deposits that have a six-month term can be used for six-month loans. Savings accounts that can be withdrawn in one day can be placed in investments of one day. The stronger a financial institution in terms of its own capital, the more it can choose to deviate from matching, since its own capital provides an additional source of funds to meet deposit withdrawals. Weak institutions should not mismatch at all. BANDESA is correct to use its savings deposits for investment only.
- BANDESA is aware of the risk of agricultural lending to smaller farmers. Even if able to match deposit maturities with loan maturities, it would not be appropriate to use deposits for such lending unless it was assured it could recover more than 92 percent of its loans (the overall recovery rate for BANDESA averages around 70 percent or less). BANDESA's ability to make timely irrigation and crop loans and social payments is crucial to optimal implementation of this project. Timely collection of loans and the interest due is also of potential interest to BANDESA and to AID as financier of the HADS trust fund. When the maximum 15-year loan term is used in conjunction with a two-year grace period, the funds collected will not contribute significantly to the ability to make new loans for new projects. Likewise, the interest payments lose value each year while the cost of collection climbs (because of inflation).

A potential for serious implementation delay exists should DIGESA be able to generate a significant increase in irrigation loan requests. BANDESA must use its own capital to make the loans prior to being reimbursed (beyond budgeted loans for six months). Its ability to lend can be limited during peak periods of demand (March-May), should planned lending be exceeded. This can hinder BANDESA's ability to make irrigation loans, social payments and crop loans to participants. When such a situation occurs it is doubtful that lack of funds will be cited as the reason for lack of lending. More likely, insufficient documentation and improper economic analysis will be used to explain the delay. One delay in funding a project was due to the lack of budgeted funds in a particular region. This situation was supposedly resolved in part by the GOG treasury agreeing to advance budgeted funds by region for up to six months. However, if the demand rapidly expands beyond the budget, the previous problem of delays would reappear. While project loan funds can be transferred from region to region based on needs, government approval must be sought for interregional budget changes. Since

lending above a region's six-month loan budget requires use of BANDESA's own funds, this can affect project lending despite DIGESA and AID's willingness to reprogram regional needs (i.e., BANDESA illiquidity).

Recommendations

First, AID should advance loan funds and social payment funds since these payments create both financial and administrative costs for BANDESA. AID should advance funds even when six-month budgets are exceeded. *

Second, in situations where inflation is high or varies considerably (and therefore would be impossible to price into loans), the rate should be variable once tied to an acceptable index set by the monetary authorities. Inflation was at an annual rate of about 14 percent as of April 1987 and had been 30 percent in 1985 and 41 percent in 1986. Long-term loans can only compensate for expected inflation by using higher rates.

Third, BANDESA should raise its rates from 10 percent to 12 or 14 percent and use the additional income, in part, to provide farmers and credit agents with incentives for on-time repayment and collection, respectively. The rate of 10 percent is already deemed acceptable to farmers. On loans that provide farmers with irrigation, higher rates would be acceptable and payable. In fact, the higher the rate and shorter the term, the greater incentive there is to attract participants who wish to diversify production. In Region II, for instance, the soft terms are what convinced one group of farmers that, even with growing only one crop of beans per year, repayment would not be a problem. *

Fourth, BANDESA should be allowed to receive a 10 percent commission on irrigation loans and three percent on crop loans in addition to retaining the interest.

Fifth, the fideicomiso should be changed to provide a direct two percent commission on social payments in addition to the overall five percent GOG counterpart payment.

Sixth, the maximum term should be reduced to 10 years, and the normal term should be five years. The longer term should be used only for exceptional cases when five years is proven to be inadequate. This will reduce collection and record-keeping costs by two-thirds (five-year loans require one-third as many collection trips as 15-year loans).

Seventh, the two-year grace period should be eliminated.

x Eighth, part of the increased income generated by the above recommendations should be used to maintain and purchase additional equipment and vehicles, pay incentives, etc.

x Ninth, savings mobilization should be expanded once cost accounting can demonstrate that the margin earned on sound investments exceeds the cost of mobilizing small deposits. BANDESA's net earnings would strengthen it and could be used to pay for staff and equipment and thus improve its ability to lend to farmers. AID and other donors should not insist that deposits be used for lending or that such deposits represent the capacity to lend and that provision of additional funds is therefore not justified.

Tenth, budgets submitted to the government should state that regional variations in the use of AID project funds are expected and desirable. Like line-item transfers of funds from region to region can be made based on agreement between BANDESA and DIGESA without additional approval by AID or GOG.

2. BANDESA's Inability to Fully Recuperate Loans

If BANDESA has such high-level staff, why has loan delinquency been such a major problem? Various sources internal to BANDESA (personal communication, November 1987) cite three reasons:

- loans are made to the politically powerful with no expectation of repayment;
- there is pressure to lend to weak cooperatives and federations; and
- there is pressure to lend in areas disturbed by violence and to allow such loans to go uncollected to avoid any potential conflict or ill will.

Given the distance staff must travel from the bank to borrowers' residences, poor rural road conditions, risk of crop failure, inflation, and the small size of individual loans, BANDESA's interest rate of 10 percent does not cover costs. Failure to recover 90 percent of loans made eats up 100 percent of the income from the loans that are recovered. Moreover, the inability to contact borrowers easily makes multiple collection visits necessary and leads to infinitely higher processing costs to the bank.

x In all regions visited, BANDESA operates with old and inefficient equipment and vehicles. Loans, collection, delinquency and reporting to AID are all done manually. Its existing fleet of vehicles, what few there are, require constant

repairs and many are out of commission. In several agencies visited, basic office equipment, such as calculators, and typewriters, had to be borrowed from other government organizations. All of these factors make it very difficult for BANDESA to be fully responsive to the needs of its borrowers.

Recommendations

AID should authorize funds for the purchase of vehicles and office equipment, including microcomputers at selected regional district offices and a compatible computer in BANDESA's central office. A needs assessment should be done to determine priority items for each regional district office and selected agencies. In some offices, computerization may not be cost-effective due to the low volume of credits and social payments to be processed. A wise use of funds may be to recondition and/or renovate selected vehicles in BANDESA's fleet rather than purchase replacement vehicles. The need for basic office equipment, such as typewriters and paper-tape calculators, should not be discounted. Should the level of credits and social payments expand significantly, the need for vehicles and equipment will be critical.

3. Discrepancies in Economic Justification of Irrigation Projects

The evaluation team detected disparate methods for calculating the economic analysis (justification) of small-scale irrigation projects in different regions. While DIGESA is charged with preparation of these analyses, BANDESA has review and approval authority and has challenged, in some cases, their validity (especially in Region II). The evaluation team noted an emphasis on the analysis of "stock" vegetables as the basis for justifying irrigation projects. No analysis of improved production levels of traditional crops (maize and beans) was observed, even though many project participants stated they would cultivate maize and beans on irrigated land. Analyses were being made with no regard for seasonal price fluctuations, distance to market, transportation costs, quality of access ways, or potential markets.

DIGESA, together with BANDESA, should prepare a uniform format and methodology for computation of the economic analysis and justification of irrigation projects. The economic feasibility should depend on the percent of irrigated land dedicated to high-value (diversified) crops and to traditional crops, and on the net value of production after transportation and handling to the point of sale. The uniform format should also include aspects of price and marketing data and transportation costs. DIGESA and BANDESA should look at

feasibility models for the improved production of traditional crops under irrigation. Economic analysis should be based on the profitability of total farm activities related to irrigated agriculture.

4. Lack of Policy on Crop Production Credit

HADS was designed without a crop production credit line in BANDESA's fideicomiso, even though other projects (e.g., Small Farmer Diversification Systems, IDB-630) have these provisions in their fideicomiso agreements with the bank. Another problem exists even with the flexibility to offer short-term crop production credit. That is, some farmers--especially those with limited or no crop diversification experience and/or who have recently inaugurated their first irrigation project and are carrying its debt--are terrified at the thought of being saddled with a second debt. The evaluation team observed this repeatedly, especially in Regions II, VI and VII where small-scale irrigation and diversified crop production are relatively new.

Recommendations

* HADS should approve the use of trust funds for short-term crop production loans for farmers who have demonstrated a capacity for and/or experience with diversified crop production.

To ensure that less-experienced farmers have agricultural inputs needed for the first few cropping cycles after an irrigation project is completed, a budget line should be included in the irrigation infrastructure loan to include the purchase of a minimum amount of agricultural seed, fertilizer, pesticides, and basic tools and equipment (e.g., fumigator) to get the farmers through the initial one or two crop cycles. The amount needed should be based on cost figures developed in the economic analysis for each irrigation project. This will remove the pressure on farmers (especially in regions other than I and V) to solicit crop production loans right on the heels of their irrigation infrastructure loans--a concern mentioned by various farmers. These agricultural inputs would then become the basis of follow-up training and extension on irrigated lands.

V. ORGANIZATIONAL STRUCTURE, MANAGEMENT AND COORDINATION

As envisioned in the PP, HADS would have a similar organizational structure to that developed in the Small Farmer Development and Small Farmer Diversification Systems projects. DIGESA is the chief implementing institution for small-scale irrigation and soil conservation components. BANDESA provides financial services as the lending institution for irrigation infrastructure loans and as paymaster for social payments for construction of soil conservation structures. INAFOR administers the finances and activities under the forestry component separately, while DCR administers its own finances and activities under the access roads maintenance component. AID oversees HADS through three different project managers (one each for forestry, roads and irrigation/soil conservation) who administer loan and grant funds and are charged with ensuring that the project and its implementing agencies execute the project within the design, spirit and conditions of the ProAg.

A. DIGESA's Organization and Extension Outreach Approach

For the implementation of HADS, DIGESA has decentralized its management within each participating region. While the ProAg names the general director of DIGESA as the overall project authority, he has no programmatic duties.* The organizational structure at the regional level is presented in Figure 4. Annex D gives, by region, the specific numbers of employees assigned to HADS for each position. Each subregion has two to four supervisors who oversee extension agency personnel. Each extension agency normally covers one municipio. However, depending on access and population density, one agency may cover parts of other municipios.

The extension agencies, staffed by a minimum of an agronomist/agency head, promoter of 4-S clubs and a home economics extensionist, also has a cadre of guias agricolas who are paid by DIGESA. A program started by MAGA in 1986 created the role of representante agropecuario, played by men and women who are usually technical leaders or innovators in their communities. MAGA pays these representantes a minimal stipend to act as technical and political go-betweens between their own communities and technical personnel of MAGA institutions (DIGESEPE, DIGESA, INAFOR, ICTA). Guías are similar to representantes in that they are innovative farmers (men) who work in their own communities and up to two more nearby communities.

*The Unidad Coordinadora de Proyectos y Convenios (UCPC) has general oversight of HADS for DIGESA--however, this unit was created only recently and its role is still evolving.

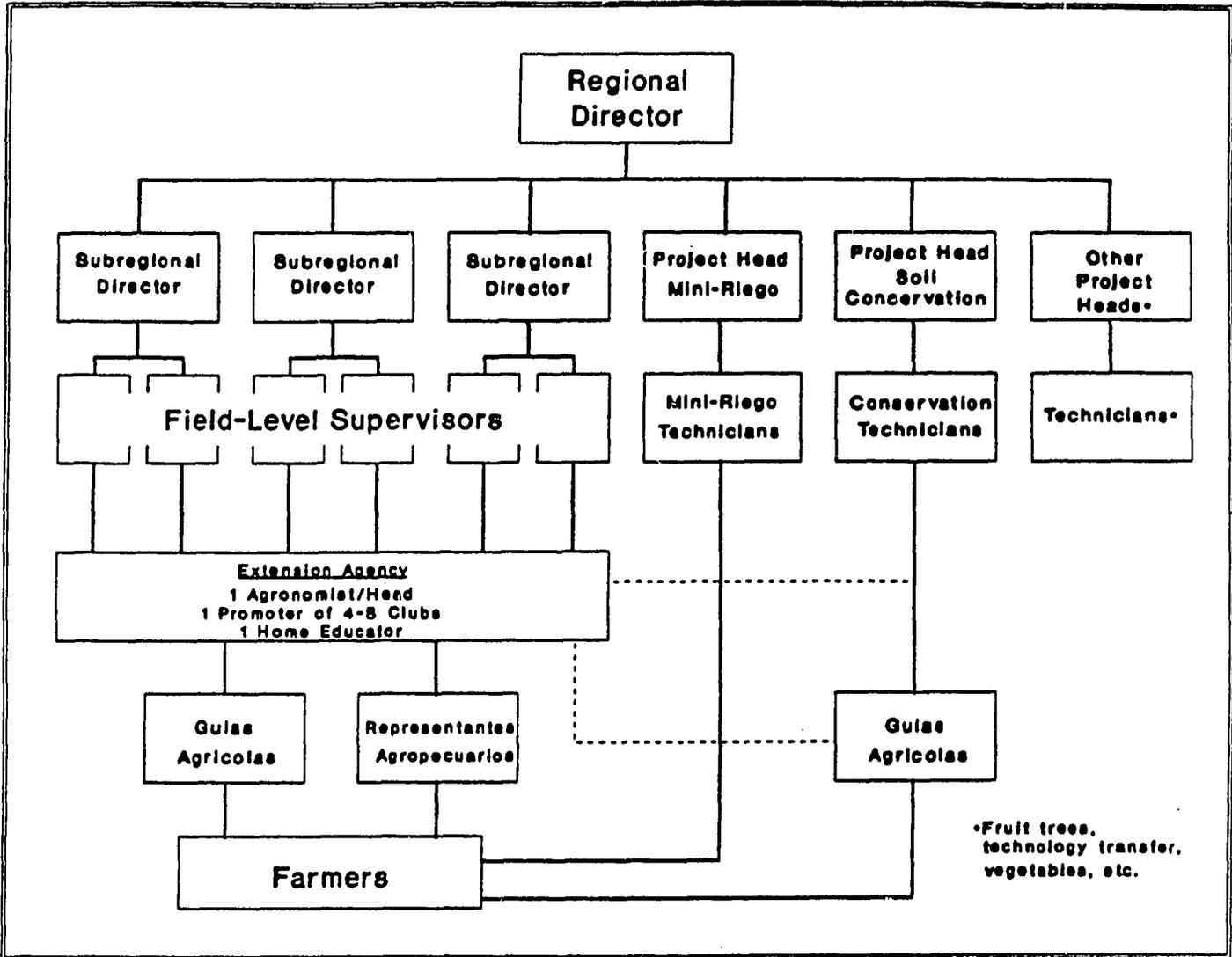


Figure 4. Organizational Structure of DIGESA at Regional and Extension Agency Levels

According to the DIGESA structure, both guías and representantes depend on this organization as its employer and supervisor. Guías may depend on the extension agencies or directly on soil conservation technicians under HADS. Both irrigation and soil conservation components should operate through the extension agencies, coordinating work and programming follow-up to project beneficiaries.

What is not evident in the organizational chart in Figure 4 is the plethora of "coordinating" and planning units around the region. MAGA is sectorally divided into DIGESEPE, DIGESA, INAFOR, ICTA, INDECA and BANDESA. Each division is relatively autonomous, although in theory they are connected under the coordination of MAGA through a series of what will be called here "lateral bureaucracies."

Since there should be coordination among these semi-autonomous directorates (the organizations have not historically shown a penchant for communication), MAGA has created the following units, which have (supposedly) different duties. Their levels of activity depend on which region one is considering:

- CORECO (Comité Regional de Coordinación), located only in Region I and specifically for the Small Farmer Diversification Systems Project, acts as a coordinating body for project activities in BANDESA, DIGESA, DIGESEPE and ICTA (CORECO is soon to be abolished);
- COREDA (Comité Regional de Desarrollo Agrícola) is the supreme representative of MAGA at the regional level and consists of regional heads of BANDESA, DIGESA, DIGESEPE, ICTA, INDECA and INAFOR--COREDA's presidency is rotated every six months among these agencies;
- CORSEPE (Comité Regional Sectorial de Producción para la Exportación) coordinates efforts at production and marketing strategies for exportable produce--members include BANDESA, DIGESA, DIGESEPE, INDECA, INAFOR and INACOP;
- COSUCO (Comisión Superior de Coordinación) is composed of the heads of MAGA general directorates and institutes at the central (national) level;
- COSUREDA (Comité Sub-regional de Desarrollo Agrícola), which is the same as COREDA but at the subregional level, supposedly provides more community-level coordination;

- UCPC (Unidad Coordinadora de Proyectos y Convenios) provides oversight, coordination and monitoring of DIGESA projects nationwide;
- UCPRODA (Unidad de Coordinación para el Proyecto de Diversificación Agrícola) is a separate coordinating board set up for the Small Farmer Diversification Project;
- URPA (Unidad Regional de Planificación Agrícola), a regional subdivision of USPADA planned for activation in 1988 with the new "Plan de Regionalización" of MAGA, will coordinate planning, monitoring and evaluation of MAGA's directorates and institutes at the regional level; and
- USPADA (Unidad Sectorial de Planificación para la Alimentación y el Desarrollo Agrícola) is MAGA's overall planning, monitoring and evaluation authority at the central (national) level.

B. BANDESA's Organization and Facilitation Approach

BANDESA's role in HADS is one of facilitation of funds and financial services. As described in Section IV, BANDESA's operations are decentralized for the most part, with lending and social payment activities coordinated with DIGESA for small-scale irrigation infrastructure and soil conservation, respectively. BANDESA depends directly on DIGESA for the promotion, creation and design of projects to be financed. Within established credit ceilings (Q15,000 per individual and Q300,000 per group) and social payment limits (up to one hectare per farmer), BANDESA agencies have the authority to approve funds. Over these limits, BANDESA's central authority (Guatemala City) must process the requests for funds (see Section IV for more detailed information). Beyond BANDESA's coordination directly with DIGESA for implementation of HADS, the bank must operate within the same MAGA bureaucracy described above for DIGESA.

C. USAID Project Management and Monitoring

*through
ORD chief*
USAID's HADS project manager (or three managers if one also considers the forestry and roads components) is directly responsible to the USAID mission director. For irrigation and soil conservation components, the project manager resides in the Office of Rural Development (ORD) and is supervised by the chief of ORD, who represents the mission's agricultural and natural resources sector portfolio and related development strategies.

Nevertheless, the project manager operates autonomously in the day-to-day management and monitoring of project activities.

As specified in the PP, AID will use quarterly (now semiannual) progress reports, field visits, and periodic evaluations and audits to monitor the project's progress toward achieving its physical, human and financial targets as the basis for realizing its overall objectives. The semiannual reports are used as succinct briefing documents to inform the mission director on project progress and problems. These reports include a financial summary (expenditures versus obligations), a review of major outputs (comparison of physical goals planned versus achieved), a discussion of overall status, problems and delays, and a topical review of activities planned for the following semester.

The project manager uses periodic field trips (visits total approximately three per year per region, although Regions I and V are visited more frequently) to observe progress at the farm level and to discuss any problems and delays with field and regional technicians.

The only evaluation to date is the present mid-term evaluation. The mid-term evaluation, as the scope of work (Annex A) indicates, is to suggest mid-course corrections to bring project execution up to expected levels and to make it more efficient.

The AID project manager must approve all financial transactions, disbursements and reimbursements, project-related procurement, expenditures for training and technical assistance. By virtue of this authority, the project manager controls, to a certain degree, the technical direction the project is taking.

D. Deficiencies in HADS Organizational, Management and Outreach Structure

Many of the organizational and management difficulties that HADS is experiencing have been somewhat inherent in the two similar projects that preceded it (Small Farmer Development and Small Farmer Diversification Systems). Recently, AID, DIGESA and BANDESA have been working to remove many of these obstacles (see Section VI.C concerning draft Amendment 4). However, it seems worthwhile to review the evaluation team's findings regarding the more serious of these deficiencies and, at the same time, to review recommendations that the team feels could help rectify the situation. Various aspects of these deficiencies have been discussed in earlier sections of this report; the effort here is to synthesize them from an overall project management standpoint.

1. Funding Confusion and Competition

* The evaluation team recorded numerous statements made by both DIGESA and BANDESA personnel about the inefficiency and confusion of managing several project accounts separately when only one is needed. The Small Farmer Diversification Systems Project, HADS and the program intentions of PL480-84 funds are to promote small-scale irrigation, soil conservation and crop diversification activities to the same target population, in many of the same geographic areas, with techniques of the same design, through the same executing agencies with the same objectives. This has caused competition among the different projects and available funds in that personnel of the executing agencies have to choose which project to use each time they expend funds for an irrigation or soil conservation activity.* DIGESA and BANDESA finally developed some criteria to elect priorities among the funds: Small Farmer Diversification Systems funds to be used only in 37 municipios of Region I; HADS funds everywhere else in Region I and (eventually) in Regions II, IV, V, VI and VII; and PL480-84 not at all (although only available in Regions II, VI and VII). There are notable differences in that Small Farmer Diversification Systems has various other extension-oriented foci, including vegetable and fruit-tree extension, crop-production credit lines, research, livestock improvement and an extension/technology transfer component. Consequently, HADS took a back seat in Region I.

* DIGESA, BANDESA and AID's paperwork and bureaucratic delays are thus doubled or tripled because of the necessity to manage, monitor and report on more than one project. In a word: the strategy is inefficient. In retrospect, the concept and design of HADS were wrong. There never should have been a HADS when expanding the geographic and financial scope of Small Farmer Diversification Systems (especially for Region I) was all that was needed.

Recommendations

* Now that Small Farmer Diversification Systems is reaching its PACD, a project redesign team is due to arrive in Guatemala sometime shortly after the beginning of 1988. The same mistake should not be made twice. All monies destined to finance activities of soil conservation, small-scale irrigation and follow-up extension should be combined into one project. This should include funding for HADS, any follow-on Small Farmer

*Differences in lending rates in 1983 made it easy to decide not to use HADS in Region I--Small Farmer Diversification was at two percent, while HADS came in at six percent.

Diversification Systems remnants and PL480-84 (earmarked for irrigation and soil conservation). Operations of this new comprehensive project should be decentralized within participating regions, with a uniform administrative and management scheme (see below). *

2. Confused Hierarchical Structure Within MAGA/DIGESA

Though not as jumbled and confused as the hierarchy that manages Small Farmer Diversification Systems in Region I, HADS still suffers from the plethora of "coordinating units" (see Section V.A above) with confused and overlapping authorities. The sectoral division of MAGA (DIGESA, DIGESEPE, ICTA, INDECA, BANDESA, INAFOR) and the lateral bureaucracies especially confound efforts to provide integrated technical assistance to farmers. In theory, the HADS outreach entity most closely in contact with the farmers is the DIGESA extension agency. However, as Figure 4 indicates, the irrigation and soil conservation components under HADS in each region make a path directly to the farmers even though, by design, they are to work through the extension agency. HADS programs are regionally and subregionally based, and are expensive to operate in terms of time, distance and fuel needed to get to work sites.

The extension agency is sparsely staffed and depends on its guías agrícolas and, more recently, representantes agropecuarios to carry the technical assistance to the rest of the farmers. This is often difficult because the guías and representantes, depending on the region, have very little (or no) formal training or specialization.*

Furthermore, the supervision of guías is confused at the extension level, again because of the sectoral nature of MAGA. An agency may have two guías assigned to the new PROGETTAPS program supervised by COSUREDA; two to four guías linked to the agency, but aligned with the soil conservation program under HADS; and two more who are assigned under DIGESA's programa básico. The head of the extension agency has no real authority over four of the guías assigned to his agency. This brings about confusion over who is in charge. Also, it is not possible to set priorities and prepare a functional work plan at the agency level because of those activities pushed on the agency by the regions and subregions with minimal thought to coordinating at the agency level.

*Region I does have a series of overambitious training modules for guías agrícolas, lasting one to two months each, covering everything from mathematics, sociology and research design to vegetable and fruit-tree production, etc.

Another obstacle to presenting integrated, farming-systems oriented technical assistance to the farmer is the fact that all sectors under MAGA operate independently of one another. DIGESEPE and DIGESA have different extension agency offices. INAFOR maintains its nurseries and rural offices separate from other MAGA organizations. ICTA may drop in at any time from its regional offices. Each sector is trying to promote its own sectoral approach to farmers--the same farmers. The farmers must entertain a visit one day from a DIGESA guia or extensionist, the next day from DIGESEPE, then maybe INAFOR or ICTA. Instead of getting technical assistance that improves upon his or her own integrated production system, the farmer must manage a portfolio of programs designed to improve only livestock, only vegetables, only fuelwood supply, etc.--each independent from the other, and each, insist the extensionists, a "priority" activity.

Finally, the lateral bureaucracies described above are being created, almost at will, to tame an otherwise inefficient established bureaucracy. The regional heads of the various MAGA organizations will never have time to manage their directorates because they must spend all their time as members of five coordinating committees and be monitored by five other coordinating units. Turf battles are bound to ensue between COREDA and URPA. COSUREDA will have disdain for COREDA because the former is "closer to the action." COREDA will begrudge COSUCO. UCPC will compete with USPADA over monitoring of the different projects.

Eventually, all of this lands on the lowly extensionist, who somehow must absorb "new priorities" and orientations à la carte. Regionally based projects parachute into the jurisdiction of the extension agency and unwittingly sabotage the agency's extension program. The agency's annual work plan becomes obsolete.

Recommendations

* Any new, redesigned or recombined project should be based on a clear hierarchy of simplistic design that avoids duplication of roles and responsibilities. Coordination with other directorates and organizations should be an implicit activity (especially at the extension agency level), not one forced upon the implementing institution through the creation of lateral bureaucracies. Authority of execution should be decentralized as much as possible to give more autonomy, logistic and technical support to subregions, but especially to extension agencies.

At the extension agency level (i.e., level of interchange with the farmers), subdivisions of MAGA--including DIGESA, DIGESEPE and, where necessary, activities of INAFOR and ICTA--should be consolidated into one functioning team with a clear hierarchy and limited autonomy to carry out integrated programs

of technical assistance instead of competitive sectoral programs. A simplistic and operational planning, monitoring and evaluation system should be created. It should be appropriate to the extension agency level that, in turn, fulfills the development program priorities of the subregional and regional authorities. This system should be developed fully by the extension agents for each jurisdiction (municipio) based on the characterizations of communities as described in Section III.C.1. Agency plans should be consolidated to form the basis of the annual plans of the subregions, which are consolidated to form the overall regional plans (bottom-up).

3. Weak and Irresponsible Financial Management by GOG and USAID

Within the Ministry of Finance, there has been a lack of coordination between the Dirección Técnica del Presupuesto and the Oficina de Coordinación de Financiamiento Externo. The Dirección Técnica has traditionally (with the exception of this year's budget) authorized less than the amounts originally budgeted for project operations, thus retarding project implementation.

The USAID fiscal year, beginning on 1 October, is out of phase with the GOG fiscal year, which begins on 1 January. The loan funds of Amendment 3, for example, approved in September 1986, could not be used in 1987 because GOG budgets for 1987 had to be submitted to the Ministry of Finance in April 1986. They were included in the 1988 budget and will be available in January 1988. Since the funds were to expand project operations into Region IV, the project has not yet been active there.

The GOG Revolving Fund will not disburse funds to an institution until the previous disbursement to that institution has been liquidated. USAID has been slow (up to nine months) to reimburse the Revolving Fund. USAID delays the processing of vouchers issued by spending institutions as well as the transfer of money from its accounts in Mexico. This problem was alleviated somewhat in September of this year, when the Ministry of Finance agreed to disburse further funds on the strength of receipt of copies of vouchers received and recorded by USAID. *

USAID too often delays the preparation of Project Implementation Letters. Among other things, these letters release the national budgets for participating institutions. It should also be pointed out that GOG waits to process counterpart funds to its institutions until it has received in its treasury the AID loan funds released by these letters--an unnecessary delay. *

USAID procurement of vehicles has been slow; no vehicle has been received by DIGESA within a year of its requisition. Fourteen vehicles are still in the process of being purchased after being requested in January 1986. In its first delivery for HADS, AID purchased the wrong model of vehicles and delivered them to DIGESA.

Recommendations

* A full-time Guatemalan financial/administrative specialist should be contracted with reprogrammed grant funds. Beyond experience in administrative and financial systems, this individual should be skilled in the analysis of GOG and, eventually, AID bureaucratic policies and procedures, thus able to suggest ways to increase the efficiency of transactions within and across institutions. The financial specialist would be charged with troubleshooting and problem-solving.

* USAID should address weaknesses in its own procedures, especially delays in the preparation of Project Implementation Letters, reimbursements and vehicle procurement. A simple, project-specific manual should be prepared in Spanish detailing USAID policies, procedures and requirements regarding the disbursement of project funds. The manual should be prepared for nationals interacting with USAID on behalf of their institutions in the context of these disbursements. Consideration should also be given to providing them with training in such matters using the manual as a text.

4. Lack of Concern for Marketing Issues

To say that irrigation is a good investment makes sense only if the return on it justifies the investment. There must, that is, be viable markets for the increased levels of production. The evaluation team feels marketing has not received sufficient attention in HADS. That marketing should be a key consideration in such projects was pointed out as early as 1983, in the Smith study cited in Section II above. The need for attention to marketing was also a major conclusion of the final evaluation of the Small Farmer Diversification Systems Project (ARD, 1987).

Several AID projects either have been or are concerned with marketing. The Fruit and Vegetable Marketing Project (520-0238) which ended last year was to complement the Small Farmer Diversification Systems Project in Region I. This project was to develop domestic as well as regional markets. However, owing to administrative problems, lack of agreement between the two participating cooperative federations, and poor planning of the Central Cooperativa de Mercadeo (CECOMERCA) facility for the receipt and cold storage of produce, the project enjoyed limited

success and never provided marketing support for the diversification project.

The mandate of the ROCAP marketing project for Central America is limited in scope. The project is concerned with marketing produce from the region in the United States (the mandate seems not to exclude Europe, but the focus is clearly on the U.S.). It is not concerned with the domestic marketing of produce, or the marketing of produce among countries in the same region (Central America).

The mandate of the AID-financed Agribusiness Project in Guatemala is to create marketing channels for small producers, especially for small-producer cooperatives. Unlike the ROCAP project, this project has a broad mandate and can market produce domestically, in the region, or overseas; to date the project has worked on all these fronts. It has been most active in Region V, selecting cooperatives that have reached a high level of organization and would promise returns to project efforts within the project's time frame of three years. The project recently selected a couple of cooperatives in Region I (where cooperatives are much less developed than in Region V), but the results of work there have not been encouraging to date.

The potential returns to irrigation systems seem to have blinded many people to a necessary precondition for achieving those returns--the existence of viable markets. There seems to be a notion that irrigation is inherently a good thing, and there has been much pressure to build systems as quickly as possible, sometimes with few rational criteria for their location (see Section III.C.1).

This lack of concern for marketing may already be a far more serious problem than is commonly realized. Vegetables and irrigation seem to go together in the local development mind. But Guatemalans still consume relatively few vegetables, the potential for export to the United States is limited, and export within the region continues to be fraught with problems. So, what are the proliferating irrigation systems to produce? If an answer to this question is not found soon, there may be a mass of indebted and disillusioned peasant farmers. Also, even supposing the existence of viable markets, farmers in Region I are far from being organized in such a way as to avail themselves of these markets; one must be careful about generalizing from experiences with cooperatives such as Cuatro Pinos, or even Rincón Grande.

Recommendations

It is recommended that HADS take a cautious look at its irrigation-building frenzy and assess where it is and where it is going. In more specific terms:

- * ● Marketing considerations should be an important criterion in the location of irrigation systems and must figure prominently in the scheme proposed in Amendment 4 for establishing priorities in the construction and location of systems.
- As recommended in the final evaluation of the Small Farmer Diversification Systems Project, there needs to be a policy statement by the public sector on its role in marketing perishable products, clearly defining the responsibilities of each institution, e.g., INDECA, DIGESA, CORSEPE. Other recommendations of that evaluation also apply here.
- A thorough study of both domestic and international marketing potentials should be carried out with a view to developing a marketing strategy for Guatemalan perishables.
- * ● The potential for linkages between the AID-financed Agribusiness Project and HADS should be considered as one way of incorporating marketing considerations into the project. As mentioned above, the mandate of the Agribusiness Project is broad, and its personnel have had valuable experience with both domestic and international marketing of perishables in the Guatemalan setting.

5. Lack of Technical Assistance

Stipulations in the PP regarding technical assistance are confusing. "Thirty-six months of short- and long-term loan-funded technical assistance will be provided to improve the agricultural extension abilities of the DIGESA employees and guias agricolas" (p. 15) was supposed to be used under the soil conservation component and \$US300,000 was set aside for this purpose in the budget (p. 17). In Annex F4 on Administration, the sum of US\$300,000 is again mentioned, but under Training. To quote from this section: "This technical assistance will concentrate on improving extension methods, especially in the areas of crop diversification, and will enhance and increase the effectiveness of DIGESA extensionists and the guias agricolas in Regions I and V" (p. 3, Annex F4). Neither the AID project manager nor DIGESA officials were aware of any such technical assistance. It would appear that there has been none--at least

no loan expenditures for technical assistance to DIGESA appear on the computerized summary accounting control sheet from the AID controller's office. However, appearing inexplicably on that sheet is a grant sum of US\$215,000 obligated for technical assistance to DIGESA, none of which has been spent to date. * Because of certain technical and administrative problems that surfaced early on in project implementation, it may have been wise to tap this technical assistance at that time.

Recommendations

It is safe to conclude, then, that to date no technical assistance has been provided to DIGESA for irrigation and soil conservation activities. Such assistance is to be provided, however, in the reprogramming of project funds through Amendment 4 or, eventually, in a new, redesigned budget. Specific recommendations concerning the use of technical assistance are found in related technical sections throughout Sections III, IV and V.

6. Deficiencies in Forestry Component Design and Implementation

The PP intended that the INAFOR would promote the reforestation of approximately 120 hectares of fast-growing fuelwood trees on publicly owned land. The activity was to be considered a "pilot" program to determine INAFOR's implementing capacity. Under the component, community and municipal reforestation committees would be organized and paid to reforest selected public lands. After two years, according to the PP (p. 22), people employed to reforest public lands ". . . will better understand the desirability and profitability of reforestation on their own land." After these same two years, INAFOR would begin nurseries for the sale of Alnus, Eucalyptus and several fruit-tree species to rural communities in the Highlands.

By and large, the forestry component as conceived under HADS was way off track. INAFOR's experience has shown that the reforestation of public land by local villagers who are paid for their labor is not the way to raise their consciousness about the "desirability and profitability" of reforestation. Indeed, these plantations (138 hectares reforested) were not that well respected by local farmers; several plantations were burned and animals were allowed into others. Several replantings were done in these areas, doubling the cost of reforestation. Another problem is that so-called "fast-growing" species in the Highlands take 10 to 20 years and more to reach a size and diameter worthy of harvest. Farmers will not be able to appreciate the "desirability and profitability" of reforestation after only two years. On two occasions, frosts killed the young plantations in

higher areas of the Altiplano--an indication that establishment of artificial forests in the Highlands is very difficult.

In 1986, HADS Amendment 3 added more funds to the component to expand activities into the management of natural pine forests as well as adding another 200 hectares to be reforested. The forest management activities include forest protection (fire and disease), thinnings, selective harvesting and leaving seed trees to stimulate natural regeneration.

The idea to move into forest management is a good one. The forestry component, however, has no geographic coordination with the other HADS irrigation and soil conservation components. The forestry activities are handled sectorally, in different communities with different project beneficiaries. In fact, in AID, the forestry component is managed by a different project manager than that of other HADS components--thus contributing to this separation.

Recommendations

* The forestry component should be integrated into HADS as a watershed management activity directed at conserving the forests in the tributaries to the irrigation projects being supported by the project. Foresters should be directly integrated into DIGESA extension agencies as part of the extension team, whether paid by DIGESA or INAFOR. Minimal funds should be made available to these foresters for operations, materials and equipment needed to carry out forest management, protection and consciousness-raising activities in these watershed areas.

* AID should assign this component to the same project manager who currently handles the irrigation and soil conservation components in order to integrate the same for the activities of watershed management mentioned above. Any other forestry activities, outside of the geographic area of influence of the irrigation and soil conservation activities, should be stripped from HADS and be considered separately under a different initiative.

7. Deficiencies in Access Roads Maintenance Component

According to the HADS PP (p. 5), this component ". . . is designed to assure that rural access roads constructed in the Highlands continue to provide access to markets, agricultural inputs and extension services." DCR is charged with developing labor-intensive maintenance programs on roads built under DCR since 1978, in areas that include parts of MAGA Regions I, V, VI and VII.

Whether implicit or not in the original intent and design of HADS, the access roads maintenance component has had little or no relation with the other HADS components (soil conservation, small-scale irrigation, forestry). DCR has developed its own agenda in terms of selecting which road segments to maintain based on its own data analysis/priority weighting program. In most cases, the activities of DIGESA, locations of existing and/or future irrigation projects, and concentrations of conservation-treated lands were not given consideration (except by coincidence). Also, as originally designed, DCR will not provide funds for the maintenance of road portions that the organization itself did not originally build--thus greatly restricting the program's outreach and impact. *

AID project management has been lax in insisting that DCR adhere to at least the spirit of the HADS ProAg, that the roads component give priority to the other HADS components. Part of this can be explained by the fact that AID's management of the roads component is carried out by a different project manager than other HADS components (the roads project manager is in AID/Engineering while the project manager of irrigation and soil conservation is in ORD). *

The impacts of limited access are especially negative to vegetable producers who must depend on large and numerous shipments to get their perishable produce to market. The question of whether the cart or horse comes first (road or irrigation project) is continually debated in AID and between DCR and DIGESA. Regardless of which organization's assessment is correct, the vegetable producer is the eventual sufferer.

Recommendations

The roads component should be stripped from HADS and continued under a different infrastructure development initiative. Priorities of AID/ORD and DIGESA should be considered by DCR in the selection of road segments to be constructed, rehabilitated or maintained. DCR should develop criteria which include current and future locations of irrigation projects and other areas where improved access is necessary to the successful production and marketing of small-farm agricultural produce. DIGESA should, in many cases, act as proxy in representation of the farmers in these locations. DCR should also consider road segments that, although not constructed through DCR programs, are important to local communities as principal access ways. *

VI. CONSIDERATIONS FOR THE FUTURE OF HADS

This evaluation is being carried out midway through the project's seven-year life (the PACD is 30 September 1990) and, according to the evaluation scope of work, its purpose is ". . . to improve project implementation, as well as strengthen the institutional capability of the implementing agencies for carrying out this and other small-scale irrigation and soil conservation projects . . ." The evaluation team made a rapid reconnaissance of the HADS project area, visiting all five MAGA regions currently participating in the project and interviewing over 50 DIGESA and BANDESA employees and some 20 participating farmers. The evaluation concentrates on the process and operational framework of HADS and, to a lesser degree, on an analysis of specific techniques.

In Section II of this evaluation report, an overview of the economic impact of the project is presented, drawing both from the limited information base available specifically on HADS, and from the experience of other projects of similar design. Sections III, IV and V offer a critical analysis of the project, taking issue with what the evaluation team found to be deficiencies or obstacles in the implementation of HADS during its first 3.5 years. The present section synthesizes the work of the evaluation team into major findings and conclusions, then offer a series of recommendations intended to render HADS a more organized and efficient development effort as well as fine-tune its focus at the field level. Finally, this section provides the evaluation team's response to draft Amendment 4 to the HADS ProAg, which is currently circulating in DIGESA and BANDESA offices for discussion. The team has examined the amendment in light of its concordance with the team's own findings, and attempts to respond analytically to each of the principal articles of the amendment.

A. Major Findings and Conclusions

Because no baseline surveys were ever developed for HADS, it is not possible, at this time, to reliably analyze the project's economic impact on its beneficiaries. Studies carried out in relation to other projects with similar objectives and technical interventions have shown that the incomes of beneficiaries of soil conservation and irrigation works rise faster than the incomes of non-beneficiaries, and also that these works lead to at least a 50 percent increase in agricultural production. Terracing alone can lead, in time, to a doubling of yields of traditional crops such as maize and beans, and in one study 20 percent of a sample of maize farmers with terraces showed yield increases of 200 percent or more. Increases in net income through irrigation and the production of nontraditional crops can

be striking, with increases of between 400 and 900 percent. In another study, the gross margins of farmers growing snowpeas (under irrigation) were more than 15 times those of farmers growing maize. And farmers growing broccoli and cauliflower had gross margins more than five times those of farmers growing maize. All of this points out that HADS has a very positive impact on its participants, both in terms of increased agricultural production and in augmenting on-farm income (consistent with the project purpose).

* One measure of project efficiency is a comparison of expenditures versus time elapsed in project implementation. Of US\$7,259,000 in loan funds obligated to date for HADS soil conservation and irrigation, only US\$1,332,021, or 18 percent, will have been committed by the end of 1987. On closer scrutiny, however, this "pipeline" problem is not as serious as the low percentage would make it seem. With the official devaluation of the quetzal in early 1986, it took fewer dollars to supply the quetzal amounts fixed in the budgets of the implementing agencies than when the two currencies were at par. A large volume of dollars thus remained in the AID project account. Dollars committed to the BANDESA trust fund for the six MAGA regions, for example, represent only 17.5 percent of the amount obligated for the fund. This figure clearly compares unfavorably with the project time elapsed of 59 percent. But if the "committed" figure were appropriately adjusted upward to factor out the effects of devaluation, 48 percent of the obligated funds (i.e., quetzales) would have been spent. This figure obviously squares better with the 59 percent of time elapsed. HADS is truly behind schedule, however, because of certain implementation deficiencies described in this evaluation report, including the finding that the project has weak and irresponsive financial and administrative management, both within USAID and GOG.

* Because of the duplicity of objectives, target populations, technical interventions, outreach areas and executing agencies, HADS and the earlier Small Farmer Diversification Systems Project should have been combined--that is, HADS should not have been created as a new project, rather as an amendment to Small Farmer Diversification. Along with other development initiatives and projects, HADS is operating within the confusing sectoral hierarchy of MAGA, whose various directorates have overlapping responsibilities, a plethora of lateral bureaucratic "coordinating units," and a "top-down" sectoral planning approach which confounds the efforts at the extension agency level to offer farmers integrated technical assistance.

* Concerning the interventions being promoted by HADS, both small-scale irrigation and soil conservation (physical structures) are technically sound, with the exception that the soil conservation program lacks an overall conservation "package" that should include appropriate land preparation and agronomic

practices. Soil conservation is not being promoted on lands under irrigation projects at the level specified in the HADS PP. Also, the arbitrary selection of areas for small-scale irrigation and soil conservation activities and project participants has led to a lessening of impact and several unjustified or ill-conceived projects. Follow-up agricultural extension has been grossly inadequate, and this threatens to undermine the medium- and long-term integrity of these technical interventions.

BANDESA is doing as good a job as possible providing credit services to project participants. BANDESA's illiquid financial situation hampers its ability to respond fully and agilely to the credit needs of project participants. Because of its limited funds BANDESA could face debilities and delays in supporting DIGESA, should HADS activities expand at a more rapid rate. BANDESA's limited ability to recuperate loans can be explained by its deficient material and logistic resources as well as its approval of certain economically unjustified loans. Under HADS, * BANDESA has no provision for crop production loans, which has negatively affected full use of small-scale irrigation systems.

Other major findings include the fact that the project has no marketing component. This represents a ticking time bomb in light of an increase in landholdings coming under irrigation and diversified production. The HADS forestry component has had little to do with other project components, thereby losing the impact of an integrated development approach to natural resources management. Also, the access roads maintenance component has operated independently of the other HADS components, in apparent disregard for the intentions of the project to interrelate diversified agriculture with improved access.

B. General Recommendations

As evidenced by the project's positive impact on its participants, HADS should certainly continue what it is doing. At the same time, the evaluation team supports the GOG's and USAID's desire to increase the levels of execution and expansion of the project. Thus, the team fully supports an amendment to the ProAg to resolve deficiencies and remove the obstacles to efficient implementation so that the project can achieve or surpass its objectives. Within this amendment, the team suggests that USAID, DIGESA and BANDESA consider the following general recommendations, specifics of which are found in Sections III, IV and V of this evaluation document.

① First, USAID and GOG should bring the exchange rate between the dollar and quetzal in line with reality and reprogram the levels of grant and loan support accordingly. At the same time *
② USAID and GOG implementing agencies should review their financial and administrative procedures to create solutions to the

bureaucratic delays that have negatively affected timely project implementation.

① *
Second, the redesign of the Small Farmer Diversification Systems Project and a reprogramming of funds under HADS should be combined. The result should be a single, solitary project that contemplates the most appropriate and successful components and technical interventions developed under each project. Any PL480 funds earmarked for support of similar technical interventions (i.e., irrigation and soil conservation) should be incorporated within the structure of this single project. This new or redesigned project should operate under a clear hierarchy, avoiding overlapping responsibilities and an overabundance of lateral bureaucracies of "coordination." A decentralized, integrated, "bottom-up" planning and monitoring scheme should be developed for the MAGA/DIGESA extension agencies and exercised by extensionists, guias and representantes at that level. Top-down, sectoral interference with the agricultural extension effort should be avoided.

② *
Third, appropriate land preparation and agronomic practices should be combined with physical structures to create a more effective soil conservation package. It should be a mandatory priority to combine soil conservation activities with small-scale irrigation projects. Part of this effort should include a closer examination of appropriate alternatives to the project's overemphasis on bench terraces. To ensure the integrity of the technical interventions being promoted, a physical resources inventory and a characterization of local socioeconomic conditions should be carried out as part of a system to select priority areas for small-scale irrigation and soil conservation, as well as future project beneficiaries. HADS should remove the irrigation component from HADS activities in Region II and restrict irrigation in parts of other regions because of otherwise favorable meteorologic conditions in these areas. Follow-up extension activities in the project area should be vastly improved through development of practical training modules and manuals to fill the current voids of technical assistance to farmers. Training will be directed first to extensionists, then to guias and representantes who, in turn, will be better prepared to orient and train farmers.

③ *
④ *
⑤ *
⑥ *
⑦ *
⑧ *
Fourth, BANDESA should increase its efficiency and move toward reversing its illiquid situation through higher commissions for processing and recuperating loans and processing social payments. The bank should cut the maximum term from 15 to 10 years on irrigation infrastructure loans and eliminate the two-year grace period. Together, BANDESA and DIGESA should create a uniform format for the economic feasibility analysis of small-scale irrigation projects based on improved costs, marketing and price data, and in consideration of the entire farm's profitability. BANDESA should offer crop production loans

from the HADS trust fund for established, diversified farmers. For farmers who are inaugurating new irrigation systems and have limited or no experience in diversified crop production, BANDESA should offer a representative budget line within its irrigation infrastructure loans for the purchase of agricultural inputs for the initial one or two crop cycles. BANDESA should receive support to purchase basic needed office equipment and vehicles to improve its credit services. *

⑤ Fifth, HADS should provide funds for a marketing component, whether project specific or in collaboration with other projects and programs (Agribusiness Project, INDECA, CORSEPE), to determine and ensure markets for the expanding production of non-traditional crops. *

⑥ Sixth, the HADS forestry component should be reoriented toward management of the tributary watersheds of both the present and future irrigation projects, and funds should be provided to INAFOR to carry out forest management/protection and consciousness-raising in these watershed areas. *

⑦ Seventh, the access roads maintenance component should be stripped from HADS and included under a separate initiative. Nevertheless, DCR should illicit input from DIGESA to consider access roads construction and management in areas where small-scale irrigation and soil conservation projects require improved access to get produce to market. *

Finally, USAID should assign all HADS components to one project manager to avoid confusion or separation of components. The project should be considered integrated, thus its management should be integrated. *

C. Response to Draft Amendment 4

This section presents the evaluation team's response to USAID's draft Amendment 4 to the HADS ProAg. The amendment, drafted in Spanish by the AID project manager for HADS, represents his most comprehensive effort to date to make needed adjustments in the project's orientation and operation in order to get it on track with regard to expected outputs. As will be evident in the following discussion, the evaluation team found many of the same deficiencies and made recommendations that are similar to those in the draft amendment language. For this reason, the evaluation team reinforces many of the proposed enhancements appearing in the draft amendment. In some cases, the evaluation team suggests more specific or additional enhancements to HADS. Where the team disagrees with proposed enhancements or has identified alternative approaches to resolving certain deficiencies, these are discussed. The evaluation team's specific responses follow each principal group

of proposed changes and/or enhancements as they appear in the draft amendment. These enhancements have been summarized for brevity and appear in bold below. The section numbers and letters (in parentheses) pertaining to each activity or component correspond exactly to those appearing in AID's amendment.

(IV.2.A) Small-Scale Irrigation Systems--DIGESA

Prioritization of Areas, and Project Planning:
a) design of computerized system for assimilating and processing baseline information for selecting potential areas for small-scale irrigation;
b) system for priority selection of potential projects based on pre-feasibility analysis.

The evaluation team fully supports the systematic approach to the selection of priority areas, following the additional guidelines presented in the team's recommendations in Section III.C.1 of this evaluation report.

Design and Analysis of Projects: a) preliminary list of potential projects in order of priority, and development of a promotion program through technicians, extensionists, guias, representantes;
b) development of a computerized system for automatic design and analytic calculation of small-scale irrigation projects, including aspects of economic analysis, marketing and price data--credit application documents and analyses will also be developed through this system.

While creation of a computer system for handling the activities mentioned above is needed and advisable, the evaluation team feels that the baseline data to be fed into the system (production data, cropping budgets, marketing and price data) do not currently exist, and the first priority should be to obtain these data as per recommendations in Section III.C.1. The team supports the development of a promotion program through DIGESA field staff, but training and promotion materials are needed as these have been deficient in all regions except Region I (see Section II.C.2).

DIGESA/USAC Mutual Assistance Program:
a) characterization of watersheds, including aspects of physical resources and socioeconomic baseline data; b) follow-up of small-scale irrigation projects, including technical assistance (extension) to farmers and basic investigation of agricultural practices on irrigated lands.

The evaluation team fully supports the creation of a mutual assistance project with USAC and its Ejercicio Profesional Supervisado. Aspects of this collaboration were discussed with university representatives and are detailed in Section III.C.1, including inventory of physical (i.e., watershed) resources and participation in a program to characterize local socioeconomic conditions. These activities should be closely coordinated with DIGESA personnel at the field level. The evaluation team does not think USAC students should attempt to give technical assistance directly to farmers, as this could conflict with the normal extension program of DIGESA, its extensionists, guías and representantes agropecuarios.

(IV.2.B) Soil Conservation Program--DIGESA

Fragile Lands Inventory (eroded areas): a) use of satellite imagery and computerized interpretation (general level); b) characterization of eroded areas at the ground level, selection of priority soil conservation areas and strategies.

While the evaluation team supports the inventory of watershed resources and the selection of priority areas for soil conservation interventions, it warns against the use of satellite imagery as a basis for that inventory because of the mountainous nature of the project area and the abundance of minifundio, small cultivation plots and the very dynamic character of agriculture in these areas. The team suggests the methodology described in Section III.C.1--again, involving USAC students. ✕

Improvement of Strategy Development and Program Planning.

The evaluation team agrees with the notion that improved baseline information is a key factor in improved planning. In addition, the team emphasizes that the project's (DIGESA's) deficiencies in planning are due to the lack of an integrated, decentralized and operational planning scheme at the extension agency level, as well as the confusing and overlapping responsibilities of MAGA's other sectoral directorates and programs (DIGESEPE, INAFOR, ICTA, PROGETTAPS, etc.). The team suggests a reorientation of the planning effort as per recommendations in Section V.D.2, which promotes "bottom-up," integrated planning, beginning at the extension agency level.

(IV.2.C) Crop Production Credit--BANDESA

The evaluation team fully supports the establishment of a crop production credit line under HADS for farmers with established capabilities in diversified crop production. At the

same time, the team cautions DIGESA and BANDESA against pushing these credit lines onto farmers who are inexperienced and/or just beginning to experiment with diversified crop production on their newly constructed irrigation projects. It was observed repeatedly, especially in Regions II, VI and VII, that many farmers are frightened by the idea of carrying a second debt after only recently acquiring the irrigation infrastructure loan. For these farmers, the team suggests that a representative credit line be incorporated directly into the irrigation infrastructure loan at a level sufficient to purchase the agricultural inputs (e.g., seed, fertilizer, agri-chemicals, equipment) needed for the initial one or two cropping cycles, as per recommendations in Section IV.C.4.

(IV.2.D) Improved Credit Services--BANDESA

Installation and Operation of Six Microcomputers (all in Region I) to Simplify Credit Documentation and Control.

Purchase of 24 Vehicles (two per agency and one for each caja rural--all in Region I).

Funds for Purchase of Office Equipment, Supplies and Publicity Services.

Creation of a Branch Bank (Sucursal) in Region I.

Recruitment and Training of 12 Credit Agents, Three Credit Analysts and Six Bookkeepers (all in Region I).

* While the evaluation team fully backs the additional support to improve BANDESA's credit services, it questions the blanket support directed to Region I when credit services are similarly deficient in all other regions in the project area. The team recognizes fully that Region I has, by far, the lion's share of credit activity (due primarily to activities under the Small Farmer Diversification Systems Project and the availability and widespread use of crop production credits), highest density of population, agro-ecologic conditions more conducive to small-scale irrigation and diversified agriculture, and a political agenda of increased develop assistance. But the team also recognizes that, if project activity increases as desired in the other regions, delays in processing loans and a degradation in credit services will ensue. As pointed out in Section IV.C.4, an assessment should be carried out to determine representative needs in all regions in order to prevent shortfalls when loan activity increases. (Remember that completion of vehicle purchases has averaged 14 to 24 months).

*

(IV.3) Technical Assistance for Organizing and Executing Provisions of Amendment 4

(IV.3.A) Contracting of Two Agricultural Engineers Specialized in Irrigation

The team feels that only one agricultural engineer need be contracted and that the Guatemalan advisor (C. Cisneros) currently working with EAT/USDA under the Small Farmer Diversification Systems Project fill this position. His efforts should be directed toward the practical training and technical supervision of DIGESA irrigation technicians. The other position should be used, instead, to hire an agricultural extension/training specialist who could concentrate efforts on the development of a viable follow-up extension program for the irrigation and soil conservation subcomponents. This extension program, as pointed out in Section III.C.2, is vastly deficient. The program would include training of extensionists, guías and representantes in the use of appropriate promotion and extension methods.

(IV.3.B) Contract a Firm to Design and Establish Computerized Information Management System for Selection of Priority Areas for Small-Scale Irrigation and Soil Conservation, and a System for Financial and Administrative Control of the Project

The team has analyzed these activities in Sections III.C.1 and V.D.4 of this evaluation report, and it fully supports the creation of a computerized information management system as a basis for control over administrative and financial aspects. The use of computers to select priority areas should, however, be limited to storing and analyzing baseline information from the characterizations of extension agency areas, not for interpretation of satellite imagery of land use, nor the creation of a geographic information system.

The team suggests that HADS contract a long-term watershed management specialist to spearhead development of the physical resource inventories, characterization of extension agency areas, * and selection of priority areas. The same specialist could also give input to the decentralized, integrated planning scheme at the extension agency level (see Section V.D.2).

Also, a long-term information management specialist should be hired to develop the computerized system and related software * programs and to train computer users/processors in the management of the system. This specialist would provide technical

assistance to both DIGESA and BANDESA in computerized information management.

(IV.3.C) Contract an Administrative Specialist to Improve Administrative, Financial and Budgetary Processes Between AID, DIGESA, BANDESA and the Ministry of Public Finance

As discussed in Section V.D.4, the evaluation team fully supports contracting this specialist and assigning him/her to DIGESA's UCPC.

(IV.3.D) Contract Two Private-Sector Firms to Identify, Promote, Design and Construct Irrigation Systems

The team supports this action only under the conditions discussed in Section III.C.1. DIGESA should cede larger irrigation projects (greater than 40 hectares) to the private sector for design, construction and supervision. DIGESA would still be instrumental in the identification of these projects and would review designs. DIGESA could then concentrate on "true" small-scale irrigation projects.

D. Other Suggested Recommendations for Inclusion in Amendment 4

The evaluation team has made numerous general and specific recommendations, which are justified throughout this evaluation report. One recommendation of immediate concern that is outside the provisions currently contemplated in the draft amendment is to remove the irrigation component of HADS from Region II. As explained in Section III.C.1, Region II and certain areas of Regions I and VII do not have a great need for irrigation due to their copious rains and short dry season. Irrigation potential in these areas is extremely limited and does not warrant, in most cases, the establishment of an irrigation team to attend to very few systems of questionable economic justification. The team therefore recommends that the irrigation team be removed from Coban and relocated in a region of greater irrigation activity. Furthermore, the northern parts of Regions I and VII should be off-limits to irrigation and efforts should be concentrated in areas of greater need. Soil conservation activities should, of course, continue in all parts of Regions I, II and VII.

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ANNEX A—SCOPE OF WORK: MID-TERM EVALUATION
HIGHLANDS AGRICULTURAL DEVELOPMENT PROJECT

ANNEX A

Highlands Agricultural Development Project (520-0274) Evaluation

Natural Resources Component

A. Background

The Highlands Agricultural Development Project (520-274) was authorized in June 1983. The Loan Agreement for a total of \$7.5 million was signed with the Government of Guatemala on September 30, 1983, while the Grant Agreement for \$1.5 million was signed on the same date. Subsequent amendments to the Loan Agreement in 1985 and 1986 added \$6.0 million. An amendment to the Grant Agreement in 1986 added \$600,000. The Project Assistance Completion Date is September 30, 1990.

The goal of this Project is to increase agricultural productivity. The purpose is to improve the productive resource base of the rural poor in the Highlands. This is to be achieved with Loan funds through access road maintenance (\$5,379,000), a pilot reforestation program (\$862,000), and construction of small-scale irrigation and soil conservation systems (\$7,259,000). The Grant funds are provided to finance technical assistance for the various components of the Project. The Natural Resources Component includes reforestation, irrigation, and soil conservation.

Original funding was directed principally to the Central and Western Highlands of Guatemala. These areas are characterized by mountainous lands with severe erosion potential where farmers cultivate small plots for subsistence. Generally, inhabitants of these areas depend on rainfall for their crops. Given these conditions, the need to expand soil conservation practices and irrigation in these areas is great.

In March 1985 a \$3 million add-on to the Loan facilitated the expansion of the area covered by the Natural Resources Component. Specifically, it was designed to carry out soil conservation and small-scale irrigation activities in Regions II, VI and VII. Prior evaluations had shown that these investments were highly successful in increasing small-farmer productivity and incomes and that their impact was one of the greatest of the GOG interventions in agriculture. The add-on in 1986 facilitated expansion to Region IV.

The Agricultural Extension Service (DIGESA) provides technical assistance to farmers in the technique of soil terracing construction and in small-scale irrigation systems design and construction. It submits to the National Agriculture Development Bank (BANDESA) the financial requirements for social payments to be provided to the farmers during the construction of the soil terraces. Moreover, DIGESA assists the farmers in preparing and submitting credit applications to BANDESA for funding small-scale irrigation systems. Social payments to the farmers are grants, while loans for irrigation systems are provided on soft terms.

Due to its longer experience, the rate of implementation in Regions I and V has been acceptable. However, the other four regions — the dry areas of the Eastern and Central valleys (Amendment No. 2, March 1985) and the piedmont area of the South Coast (Amendment No. 3, September 1986) — have experienced slow rates of disbursement due to both administrative and technical constraints arising from a lack of experience in Project procedures.

Moreover, both implementing agencies (BANDESA and DIGESA) have serious internal procedural problems which have resulted in this Project's having the largest pipeline in the Mission portfolio. The total amount authorized for the Natural Resources Component is \$9,185,500 (Grant of \$1,064,500 and Loan of \$8,121,000). With 55% of time elapsed since initial obligation of the Project, only 9% of the funds have been spent.

B. Evaluation Objectives

In order to improve Project implementation, as well as strengthen the institutional capability of the implementing agencies for carrying out this and other small-scale irrigation and soil conservation projects, a mid-term evaluation of the Project is necessary. The assessment will include an analysis of the organizational structure and functional capabilities of both DIGESA and BANDESA, their planning capabilities and field activities, and the preliminary economic impact of the Natural Resources Component of the Project. The results of the evaluation of the companion Small Farmer Diversification Systems Project (520-0255) will be valuable for the evaluation team.

The Evaluation Team will review the overall status of the Natural Resources Component of the Project (except for reforestation which will be evaluated separately) and the existing capability of the agencies involved in implementing small-scale irrigation, soil conservation, and credit activities. It will recommend corrective actions to improve the technical and administrative institutional proficiency. These mid-term evaluation findings will be used to review the Project's original design and budget, in order to include new activities and line items for improving Project performance.

The Team will assess the following issues and elements related to Project performance:

1. Project Goals and Purposes

Evaluate adherence to Project Paper objectives, mechanisms for setting priorities and quantify stated measurements or indicators to the extent possible.

2. Project Outputs

Review all outputs in relation to project design with special impact on beneficiaries. Include changes in income, production and yields;

improvements in farmer proficiency to manage irrigation and other infrastructure; and use of improved technology and inputs.

3. Project Management

Assess GOG institutional management capabilities and ability to orchestrate multi-faceted technical components as well as USAID support to the effort.

4. DIGESA Management and Planning

Assess DIGESA's mechanisms for organizing, planning and implementing activities as well as setting priorities, promotion, and organization of farmer beneficiaries.

5. BANDESA Policies and Implementation

Review overall credit policies and procedures, inter-relationships with DIGESA, and follow-up methods for credit use and repayment.

6. Lessons Learned

Describe insights gained to date that will improve future operations with emphasis on technological approaches, relevance to client groups, long-term implications to small farmer land values, host country management techniques, and institutional wills and capacities to sustain these activities.

C. Terms of the Contract

The five-person Evaluation Team will be in Guatemala for four weeks initiating its activities o/a October 26 two weeks after the completion of the Project 0255 evaluation. It will divide its time between the central offices in Guatemala City and the regional field operations. The Team will personally interview all heads of participating institutions, both at

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1. Project Goals and Purposes

Evaluate adherence to Project Paper objectives, mechanisms for setting priorities and quantify stated measurements or indicators to the extent possible.

2. Project Outputs

Review all outputs in relation to project design with special impact on beneficiaries. Include changes in income, production and yields;

specialist will be attuned to those socio-cultural parameters which are an essential part of the Project agenda.

Specific evaluation tasks of this position include:

- a. Assess the role, responsibility, and performance of the various management entities (including financial management) in the Project and the long-term institutional implications.
- b. Review the implementation process of the various infrastructure activities in the Project with particular emphasis on economic viability to beneficiaries.
- c. Assess the credit application process with particular emphasis on: credit vs. real costs of agricultural production; credit vs. infrastructure costs; credit in labor-intensive, nontraditional crops.
- d. Examine the institutional effects of establishing long-range data base information that will serve as benchmarks for future and expanded diversification activities with special emphasis on soil conservation, small-scale irrigation, and rural roads.
- e. Assess the impact of Project resources relative to long-term investment and production in diversification for small farmers.
- f. Reassess Project goals in relation to current GOG strategy of economic stability, foreign currency generation, and improved socio-economic conditions for the small farm/landless families.
- g. Summarize in a final report the Evaluation Team's conclusions and recommendations on how to improve Project performance .

Qualifications

PhD or equivalent. The candidate must be able to assess costs and returns of the Project resources and must be especially knowledgeable in the area of project management and implementation in relation to small-scale irrigation and soil conservation activities being undertaken by GOG agencies.

The individual should have working experience in multi-faceted agricultural programs and have evaluative skills appropriate to development projects. Five years experience in developing country programs is appropriate. Spanish S3 R3 is required.

2. Resource Management Specialist

This position will focus on the technical aspects governing the soil conservation and small-scale irrigation components of the Project. Specific attention will be given to the soundness and relevancy of the technologies, the management of these investments, and the long-term development lessons that have been derived from these activities.

Specific evaluation tasks for this position include:

- a. Assess the quality of technology being provided and its relevance to client groups.
- b. Estimate the cost/benefit relationships of these infrastructure activities to client groups.
- c. Assess the quality and level of credit support to activities and technical guidance being given by outreach workers.
- d. Analyze changes from traditional to diversified crops with these farm infrastructural activities.

- e. Assess the impact of the long-term institution building implications of these diversification activities.
- f. Review training resources in the activity with reference to:
 - change agent needs
 - farmer needs
 - long-term training plan
- g. Assess opportunities for private sector participation in soil conservation and irrigation with emphasis on small-scale entrepreneurs.
- h. Provide recommendations for improving the quality and spread of the technical innovations now underway.

Qualifications

Minimum M.S. level and preferably Ph.D. This specialist should have broad-based experience in field-level extension and research programs oriented to infrastructure activities supporting agriculture. Broad knowledge of the design, construction, and operational elements of irrigation systems and soil conservation structures is necessary. This specialist should know how to assess improved technology in these subject areas for small farmers and understand the critical socio-economic elements that influences adaptation. Spanish S3 R3 is required.

3. Credit Specialist

This position will focus on the credit policies and procedures governing this Project. Specific attention will be given to the investment soundness of irrigation and soil conservation and its importance to the long-term development of the farm enterprise.

Specific evaluation tasks for this position include:

- a. Review existing BANDESA/DIGESA arrangements at the central and regional levels with respect to funding of Project activities.
- b. Assess benefits of total investment per irrigated hectare and cost per hectare under conservation practices.
- c. Critique BANDESA institutional capacities to support Project efforts and recommend expanded private sector mechanisms in designing and facilitating irrigation programs.
- d. Examine overall credit policies and procedures in the Project with the ultimate aim of modifying, reforming, or significantly changing existing operational modes and procedures. Explore what role training resources could have in these efforts.
- e. Make recommendations to improve efficiency of the BANDESA trust fund and specify to the Mission and the GOG how disbursement of credit resources can be accelerated and better utilized in the Project.
- f. Contribute to the "lessons learned" on institution building in development of credit programs for Guatemala.

Qualifications

Minimum M.S. level. This specialist should have broad background, training, and practical experience in agricultural credit through private or public sector institutions. The technician should be especially knowledgeable in the area of financial management and implementation, i.e., credit for irrigation and funds for soil conservation activities under the responsibility of Government agencies. He/she should have prior experience in conducting credit evaluations and should have at least 5 years of field experience. Spanish S3 R3 is required.

ANNEX B--MEMORANDUM REQUESTING AID PROCUREMENT OF GRASS SEED

SECTOR PUBLICO AGROPECUARIO Y DE ALIMENTACION

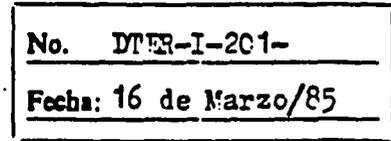
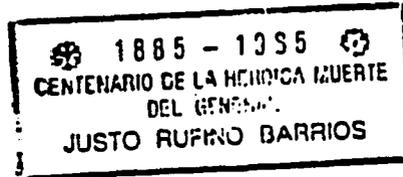
MINISTERIO DE AGRICULTURA GANADERIA Y ALIMENTACION

Dirección General de Servicios Agrícolas

REGION I. QUEZALTENANGO

DIRECCION TECNICA DE EJECUCION REGIONAL

4a. Calle 21-53, Zona 3
Teléfono 28-41 - 42-49



DIRECCION TECNICA DE EJECUCION REGIONAL : QUEZALTENANGO, dieciseis de marzo de mil novecientos ochenta y cinco.-

ASUNTO: JEFE PROYECTO CONSERVACION DE SUELOS DIGESA REGION I., T.S. GUILLERMO DIAZ, presenta justificación y utilización que fundamente su solicitud de compra de pasto en el exterior a través de AID, con cargo al fondo de préstamo destinado para pagos sociales en los proyectos 520-T-034/520-T-037 respectivamente. Viene en - oficio SUAT-0082-85 del 15/III/85.-

Atentamente pase al SEÑOR HARRY WING, DIRECTOR DE LA OFICINA DE DESARROLLO RURAL DE LA MISION AID, rogándole sus buenos oficios a efecto de que podamos contar con 50 - quintales de semilla de pasto de las variedades que se indican en el documento adjunto para resolver el problema de protección de taludes del componente Conservación de Suelos, de los Proyectos AID 520-T-034 y 520-T-037, sugiriendo que la compra sea directa en Estados Unidos de Norteamérica y que se descuente de los fondos con destino a Pago Social. CONSTA DE CINCO HOJAS UTILES.-


P. A. Edgar Domingo Conde Prera
Director Técnico de Ejecución
Regional I, DIGESA



114-

MINISTERIO DE AGRICULTURA
GANADERIA Y ALIMENTACION

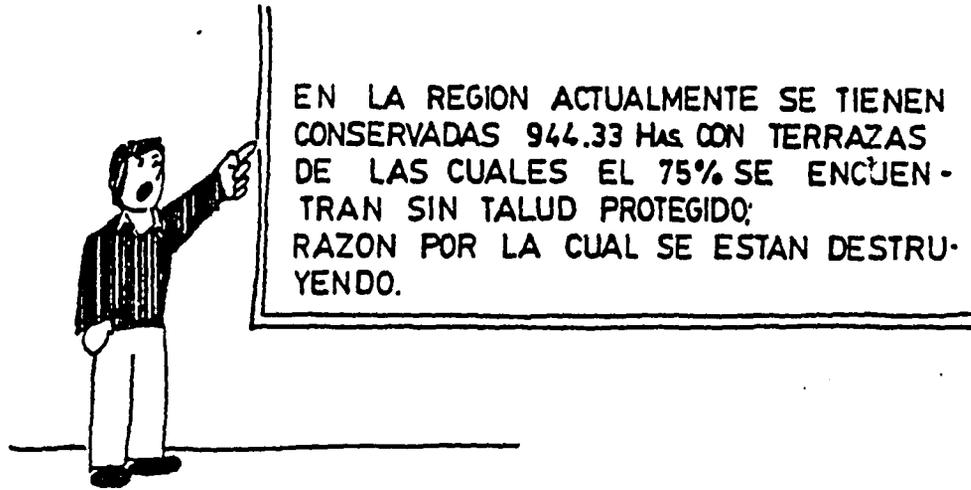
REQUERIMIENTOS DE SEMILLA
DE PASTO
PARA LA REGION - I

PROYECTO DE CONSERVACION DE SUELOS
DIGESA REGION - I

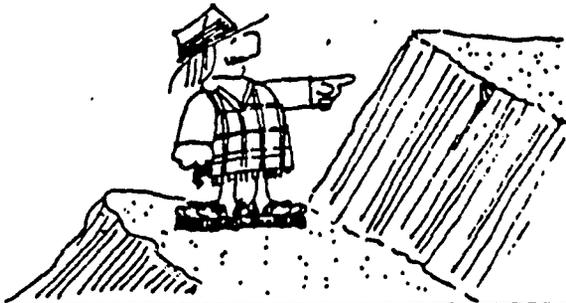
QUETZALTENANGO
MARZO 1, 1985

B-2

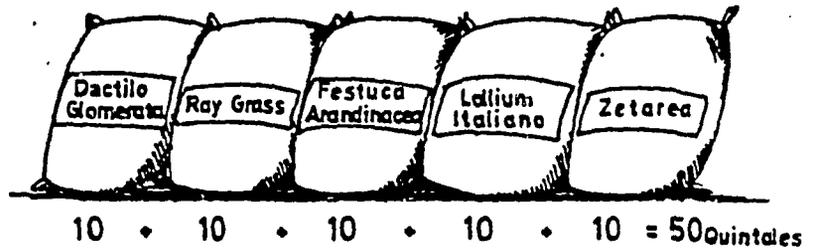
115-



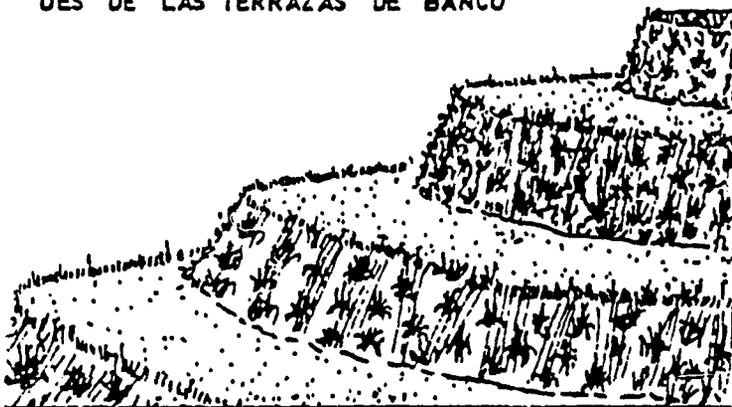
2 LA FALTA DE PROTECCION CON PASTOS HACE QUE LOS TALUDES SE DESTRUYAN, MUY ESPECIALMENTE EN LA EPOCA SECA.



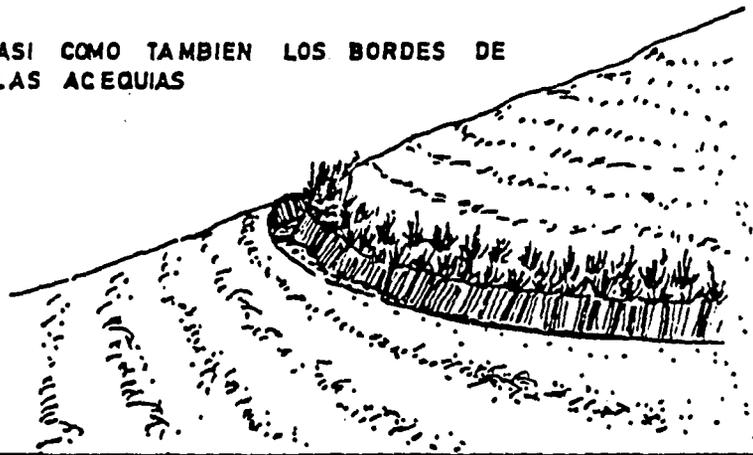
3 EL PROBLEMA SE RESUELVE ADQUIRIENDO EN EL EXTERIOR SEMILLA DE PASTO.



ESTA SEMILLA SERVIRA PARA PROTEGER LOS TALUDES DE LAS TERRAZAS DE BANCO



ASI COMO TAMBIEN LOS BORDES DE LAS ACEQUIAS

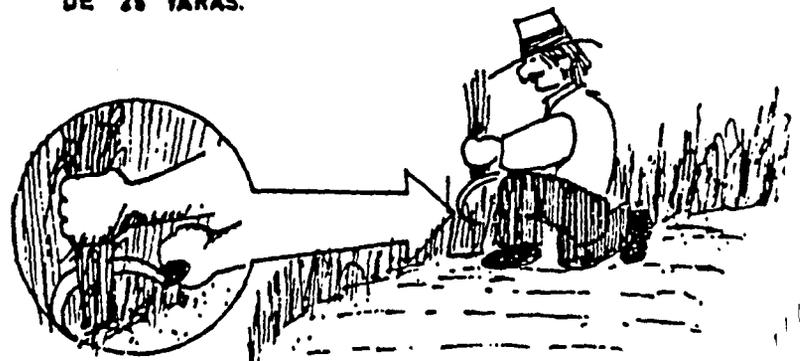


5 SEMBRANDO PASTO EN LOS TALUDES DE LAS TERRAZAS TENDREMOS ADEMAS ALIMENTOS PARA LOS ANIMALES



B-3

6 EL PASTO SE CORTA TRES O CUATRO VECES AL AÑO SE COSECHAN MAS O MENOS 4 REDES POR CUERDA DE 25 VARAS.



CON CUATRO CUERDAS DE TERRAZAS CON TALUD PROTEGIDO
ES POSIBLE MANTENER UNA VACA LECHERA



SI LA SEMILLA QUE SOLICITAMOS
NO ES ADQUIRIDA DE INMEDIATO SE
CORRE EL RIESGO DE PERDER NUE-
VAMENTE OTRA EPOCA LLUVIOSA,
HECHO QUE SERIA MUY LAMENTABLE
PORQUE ESTARIAMOS ESPERANDO LA
PROXIMA ESTACION LLUVIOSA EN
1, 986. NO HAY QUE OLVIDAR QUE
ESTA SEMILLA SE VIENE SOLICITAN-
DO DESDE 1, 983

ANNEX C--BANDESA: DEMOCRATIZACION DE CREDITO

DEMOCRATIZACION DEL CREDITO

1
2
3

Revisión de los trámites para la gestión de un préstamo, desde los instructivos hasta la minuta para su legalización.

Actualización de la Guía de Costos e Ingresos de Producción, que se utiliza de base para la concesión crediticia.

Establecimiento de políticas crediticias flexibles

a) *Ampliación de los límites de concesión de créditos* *(Facultad para otorgar montos hasta)*

<i>Agentes de Crédito, Encargados de Caja Rural</i>	<i>5,000</i>
<i>Jefes de Agencia</i>	<i>15,000</i>
<i>Subgerencia de Crédito</i>	<i>20,000</i>
<i>Gerencia General</i>	<i>30,000</i>
<i>Comité de Crédito</i>	<i>100,000</i>
<i>Junta Directiva, montos mayores de</i>	<i>100,000</i>

Estos límites permitirán una reducción del tiempo de trámite, especialmente para los créditos por montos hasta Q. 15,000 que serán aprobados en las Agencias.

b) *Mandatos especiales a Jefes de Agencia para legalización de préstamos*

Con estos mandatos especiales, los Jefes de Agencia pueden comparecer ante Notarios de la misma localidad para la legalización de préstamos por montos hasta Q. 15,000 (Reducción de tiempo de trámite y minimizar gastos de movilización del usuario).

c) *Atención crediticia a todos los pequeños agricultores*

Los pequeños agricultores que no tengan escritura ni registro en la propiedad inmueble, pero que sean

DEMOCRATIZACION DEL CREDITO

arrendatarios o estén en posesión de un terreno años atrás, podrán ser atendidos por BANDESA si se presenta un testimonio del Alcalde Local, sobre sus calidades de persona trabajadora y conocida en el lugar.

d) Montos Máximos para la concesión de créditos (Fondos Bancarios)

- Para Usuarios Tipo "A" de BANDESA y "Satisfactorios Recomendables" del Sistema Bancario Nacional.

Los créditos para montos hasta de Q. 20,000 para actividades agrícolas y Q.30,000 para ganadería, con garantías prendarias a plazo no mayores de 5 años.

- Préstamos hasta de Q. 100,000 y a plazos no mayores de 5 años, podrán ser respaldados con garantías mixtas (Prendaria - Hipotecaria). La hipoteca debe cubrir como mínimo el 40% del monto del crédito.

- Préstamos mayores de Q. 100,000, serán garantizados como primera hipoteca a favor de BANDESA, que cubra por lo menos el 60% del monto del crédito y el resto con garantías prendarias aceptables a juicio del Banco.

4

Aprobación por Junta Directiva de la modificación de los Artículos 50 y 54 de la Ley Orgánica del Banco :

(Reducción de tiempo en trámites y en costos de transacción del Crédito)

- Formalización de créditos por montos hasta Q. 30,000 en formularios propios del Banco, y legalización en la localidad en donde es concedido.

- Exención del impuesto de papel sellado y timbres en los contratos de préstamos.

Necesario que el Ejecutivo lo presente al Congreso de la República, para su pronta aplicación.

DEMOCRATIZACION DEL CREDITO

5

Se analiza, la pronta aplicación del Pagaré Agrícola para préstamos hasta por Q. 20,000 para actividades agrícolas y Q. 30,000 para ganadería, a usuarios Tipo "A" de BANDESA. También se estudió la descentralización de Registro de Prendas, lo cual incidirá en la reducción de los trámites de concesión de créditos.

ANNEX D
TECNICOS DE CONTRAPARTIDA
PROYECTO 520-T-037

MINI-RIEGO

REGIONES	I	II	IV	V	VI	VII	TOTAL
No. Técnicos	6	5	8	7	3	6	35
No. Extensionistas	5	4	-	8	8	-	25
No. Representantes	-	-	-	-	8	-	8
TOTAL	11	9	8	15	19	6	68

CONSERVACION DE SUELOS

No. Técnicos	9	5	8	8	7	3	40
No. Extensionistas	40	25	-	2	38	-	105
No. Representantes	60	33	-	5	150	-	248
Guías Agrícolas	50	-	-	29	-	-	79
TOTAL	159	63	8	44	195	3	472

D-1

ANNEX E--LIST OF DIGESA PERSONNEL SENT TO
MEXICO AND THE UNITED STATES FOR SHORT-COURSES

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SECTOR PUBLICO AGROPECUARIO Y DE ALIMENTACION

MINISTERIO DE AGRICULTURA, GANADERIA Y ALIMENTACION

DIRECCION GENERAL DE SERVICIOS AGRICOLAS

UNIDAD DE CORDINACION DE PROYECTOS Y CONVENIOS

GUATEMALA, C. A.

12 AVENIDA 19-01

ZONA 1

TEL. PLANTA

23601 AL 4

PERSONAL QUE HA SIDO ADIESTRADO CON FONDOS DEL

PRESTAMO AID-520-T-037

NOMBRE	CURSO/GIRA	PAIS	FECHA
Edgar A. Umaña de León	Bombeo para Riego	E.E.U.U.	27-09-87
Guillermo Maas Och	Bombeo para Riego	E.E.U.U.	al
Rudy Sierra Och	Bombeo para Riego	E.E.U.U.	24-10-87
Oscar Chupina Monroy	Bombeo para Riego	E.E.U.U.	"
Gustavo Sánchez Toscano	Bombeo para Riego	E.E.U.U.	"
Anibal Vargas Cardona	Bombeo para Riego	E.E.U.U.	"
José Hemogenes González	Administración de Proyectos	USA	junio- julio/87
Angel Hernández Gómez	Conservación de Suelos	México	30-03-87
José Vicente Ajpop	Conservación de Suelos	México	al
Carlos Bamac	Conservación de Suelos	México	19-04-87
Dionias I. Velásquez	Conservación de Suelos	México	"
Marco Tulio Gómez	Conservación de Suelos	México	"
César Hamilton Chum S.	Conservación de Suelos	México	"
Otto Roberto Ralón	Conservación de Suelos	México	"
Sabino Chang T.	Conservación de Suelos	México	"
Manuel Basilio Mendoza C.	Conservación de Suelos	México	"
Oliverio Miranda Aguilar	Conservación de Suelos	México	"
Carlos Vinicio Turcios H.	Conservación de Suelos	México	"
César Antonio Palma Mejía	Conservación de Suelos	México	"
Víctor Hugo Pérez Díaz	Conservación de Suelos	México	"
Ramiro Carrera Guerra	Conservación de Suelos	México	"
Otoniel Gamboa Javier	Gira de Riegos	México	24-10-86
German Isaac García	Gira de Riegos	México	al
Alejandro Pérez	Gira de Riegos	México	9-11-86

SECTOR PUBLICO AGROPECUARIO Y DE ALIMENTACION

MINISTERIO DE AGRICULTURA, GANADERIA Y ALIMENTACION

DIRECCION GENERAL DE SERVICIOS AGRICOLAS

UNIDAD DE CORDINACION DE PROYECTOS Y CONVENIOS

GUATEMALA, G. A.

12 AVENIDA 19-01
ZONA 1

TEL. PLANTA
23801 AL 4

-2-

Edgar Umaña	Gira de Riegos	México	24-10-86
Orlan Rodas	Gira de Riegos	México	al
Marco A. Hernández	Gira de Riegos	México	9-11-86
Mario Fuentes	Gira de Riegos	México	"
Osca López M.	Gira de Riegos	México	"
Luis Fernando Berganza	Gira de Riegos	México	"
Wilfredo Villagrán	Gira de Riegos	México	"
Jorge Luis Soberanis	Gira de Riegos	México	"
Leonel Santa Cruz	Bombeo para Riego y Drenaje	E.E.U.U.	Agosto- Octubre
Gustavo Herrera	Manejo y Conservación de Suelos y Aguas	E.E.U.U.	" /86 "
José Solorzano	Fomento Agro-Industrial	Costa Rica	Feb/86
Jorge Méndez Mérida	Fomento Agro-Industrial	Costa Rica	Sep/85
Dionias Velásquez	Seminario Cons. de Suelos	República Dominicana	2 al 6' dic/85

UCPC/nds.
3-11-87

ANNEX F
LIST OF INDIVIDUALS CONTACTED IN GUATEMALA

USAID

Anthony Cauterucci, Director
Harry Wing, Chief Rural Development Office
Ing. Mario Aragon, HADS Project Manager
Brian Rudert, Deputy Rural Development Office
Edgar Pineda, Small Farmer Diversification Project Manager
Lic. Gustavo Leal, Financial Specialist, Program Development Support
Ing. Jimmy San Martin, Technical Consultant, HADS Roads Component, DCR
Al Hankins, Consultant (ex-AID)
Barry Lennon, Technical Coordinator, Cooperatives Strengthening Project
Richard Clark, Liaison, Regional Non-Traditional Crops for Export, ROCAF
Peter Alfonso, Consultant, Agribusiness Project

DIGESA

Central Office

Domingo Conde, Coordinador General, Unidad Coordinadora de Proyectos y Convenios
Saul Lima Leiva
Dr. Romeo Martinez, consultant

Region I

Victor Mallorga, Jefe Regional
Edgar Umaña, Tecnico Especifico de Mini-riego
Dionias Velasquez, Tecnico Especifico en Conservacion de Suelos
Juan Gamas Mendez, Jefe de Agencia, Zunil
Alejandro Absalon Valdez, Guia Agricola, Zunil

Region II

Hugo Abel de la Cruz, Jefe Regional
Roberto Maas, Coordinador Proyecto de Mini-riego
Oliverio Miranda, Tecnico en Cons. de Suelos, Sub-region II-2

Region V

Ing. Francisco Olivet, Jefe Regional
Ing. Francisco Mazariegos, Coordinador Proyecto de Mini-riego
P. Agr. Guillermo Castañeda, Coordinador de Conservacion de Suelos
Ing. Jose Luis Zelada, Tecnico de Mini-riego
Ing. Oscar Chupina, Tecnico de Mini-riego
Ing. Leonel Santa Cruz, Tecnico de Mini-riego
Ing. Jose Solonzano, Tecnico de Mini-riego

Region VI

P. Agr. Fredy David Guerra, Jefe Regional (Interino)
Ing. Gustavo Sanchez, Coordinador, Proyecto de Mini-riego
Ing. Alvaro Escobar, Tecnico de Mini-riego

Region VII

Ing. Rolando Sanchez, Jefe, Proyecto 0274
Ing. Victor Hugo Perez, Coordinador, Proyecto Conservacion de Suelos

Equipo de Asistencia Tecnica (EAT)/USDA. (Small Farmer Diversification Project)

Gary Smith, Team Leader
Wayne Williams, Fruit Tree Specialist
Cesar Cisneros, Irrigation Specialist
John Diehl, Livestock Management Specialist
Herman Obregon, Marketing Advisor

INAFOR

Ing. Rolando Zanotti, Coordinador, Proyecto Bosques Comunales (HADS)

BANDESA

Lic. Edgar Velasco, Coordinator of Credit Manager
Lic. Carlos Diaz, HADS Trust Fund Manager
Lic. Arturo Moran, Trust Fund Manager, Small Farmer Diversification Systems Project
Lic. Sergio Molina, Financial Division
Lic. Rolando Turcios, Head of Region V
Luis Felipe Xitumul, Head of Region I

Rodrigo Cardona, Head of Credit Dept. Region I
Amilcar Garcia, Credit Agent, Quetzaltenango Agency
Pedro Domingo, Credit Agent, Quetzaltenango Agency
Lic. Carlos Wellman, Head of Region II
Anibal Marin, Subhead of Region VII
Robert Cater, IICA consultant attached to MAGA
Ing. Miguel Guzman, Jefe Centro de Computos y DCR
Sr. Hector Ramirez, Manager of Cooperative Rincón Grande
Ing. Mike Estrada, Coordinador, Area Integrada, USAC
Ing. Helmer Ayala, Coordinador, Subarea Ejercicio Profesional
Supervisado, USAC