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A.I.D. EVALUATION SUMMARY - PART I

1. BEFORE FILLING OUT THIS FORM, READ THE ATTACHED INSTRUCTIONS.
2. USE LETTER QUALITY TYPE, NOT "DOT MATRIX" TYPE.

IDENTIFICATION DATA

A. Reporting A.I.D. Unit: Mission or AID/W Office <u>USAID/HONDURAS</u> (ES# <u>FY 89-7</u>)		B. Was Evaluation Scheduled in Current FY Annual Evaluation Plan? Yes <input checked="" type="checkbox"/> Slipped <input type="checkbox"/> Ad Hoc <input type="checkbox"/> Evaluation Plan Submission Date: FY <u>90</u> <u>Q 1st</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 No.	Project /Program Title	First PROAG or Equivalent (FY)	Most Recent PACD (Mo/Yr)	Planned LOP Cost (000)	Amount Obligated to Date (000)
522-0268	IRRIGATION DEVELOPMENT	1986	9/93	22,500	14,090

ACTIONS

Action(s) Required	Name of Officer Responsible for Action	Date Action to be Completed
E. Action Decisions Approved By Mission or AID/W Office Director		
1. Execute Project Agreement Amendment to: a) provide more realistic annual output targets but continue with overall goal of constructing 6,000 hectares of irrigation and assisting 3,000 farm families; b) amend the project budget to allocate funding for a campesino irrigation construction activity funded at \$650,000 for 540 hectares of micro-irrigation systems; and c) amend the project budget to allocate funding for continued technical assistance in the amount of \$0.8 million. 2. Analyze credit mechanism, identify constraints, and amend credit regulations to improve efficiency and effectiveness of credit approval and disbursement. 3. Assess project personnel and organizational structure, and implement appropriate changes to ensure maximum administrative and managerial efficiency. 4. Conduct joint planning and execution of activities to re-incorporate WRD (Water Resources Directorate) into project activities starting in 1990, and develop a long-term strategy for phasing project personnel and material into WRD by the 9/93 Project Assistance Completion Date. 5. Take actions to: a) promote passage of National Water Law; b) execute National Irrigation Plan; c) improve quality of irrigation system design, and d) increase the number of potential beneficiaries. 6. Execute Baseline Survey.	1. Armando Busmail/Margaret Kromhout, USAID 2. Roberto Rivera, GOH 3&4. Roberto Rivera, GOH 5. Roberto Rivera, GOH 6. Armando Busmail/Carmen Zambrana <small>(Attach extra sheet if necessary)</small>	2/90 3/90 3/90 a) 12/90 b) 1/90 c) 3/90 d) 3/90 5/90

APPROVALS

F. Date Of Mission Or AID/W Office Review Of Evaluation:			
	(Month)	(Day)	(Year)
	10	16	89
G. Approvals of Evaluation Summary And Action Decisions:			
Name (Typed)	Project/Program Officer	Representative of Borrower/Grantee	Evaluation Officer
	A.M. Maxey Project Officer	Roberto Rivera Project Director	Arturo Rivera, DE Carmen Zambrana, DE
Signature			
Date	11/7/89		11/8/89
			George Wachtenheim A/Mission Director

ABSTRACT

H. Evaluation Abstract (Do not exceed the space provided)

The Irrigation Development Project is a seven year, \$32.9 million effort to enhance the earning potential of 3,000 Honduran farm families by supporting the construction and operation of approximately 6,000 hectares of irrigation systems. The Government of Honduras' (GOH) Water Resources Directorate (WRD) supported by a Winrock Technical Assistance Team is charged with implementing the project. Diez Management Systems, DSS Inc. conducted this interim evaluation (9/86 - 5/89) by reviewing project documentation, interviewing more than 100 public and private sector representatives associated with the project, visiting the project's three regional offices and eight irrigation sub-project sites, and preparing basic analyses to support evaluation findings and recommendations. The purpose of this evaluation was to assess implementation progress, determine the cause of implementation shortfalls, identify current constraints on implementation, and recommend actions to remove these constraints. The major findings and conclusions are:

- The team found that the project objectives of increasing agricultural productivity and production through irrigation are valid, well oriented, and consistent with GOH and AID strategies. However, the project has fallen significantly short of the Project Paper established implementation targets for the period of the evaluation. Lack of progress is due to: a) inadequate GOH project management and administration; b) inadequate technical assistance (especially in planning and project organization); c) ineffective USAID/Honduras supervision; and d) overly ambitious implementation targets. However, the evaluation team noted significant implementation progress during the last year and indicated that most of the management constraints have been addressed.

- The team recommended continuing the project but with the following actions to remove implementation constraints: a) amend Project Agreement and PP Logframe to reduce goal, purpose, and output targets; b) amend project budget to allocate funding for a subsistence farmer irrigation construction and operation program, and for additional technical assistance; and c) take actions to strengthen project's credit component, gain passage of National Water Law, execute National Irrigation Plan, incorporate WRD into project activities, and further improve project administration and management. The team's data and analysis provide support for these recommendations with the exception of reducing goal and purpose output targets. The Mission believes there is insufficient justification to reduce these targets.

The evaluation team noted the following "lessons": a) sufficient time should be allowed for compliance with conditions precedent to initial disbursement before scheduling major implementation achievements; b) technical assistance team leadership should be assigned to individuals with proven managerial experience; and c) there should be continuity and stability in AID project management during the early stages of project implementation, and AID direct procurements should be expedited to avoid long procurement delays.

C O S T S

1. Evaluation Costs

1. Evaluation Team		Contract Number OR TDY Person Days	Contract Cost OR TDY Cost (U.S. \$)	Source of Funds
Name	Affiliation			
Rafael Diez	Diez Mgt. Sysems, Inc.	522-0268-C-009381-00	\$100,000	Grant Funds
Jose Vivas	" " " "			Evaluation Line-Item
Raul Hofstadter	" " " "			Project 522-0268

2. Mission/Office Professional Staff
Person-Days (Estimate) 15

3. Borrower/Grantee Professional
Staff Person-Days (Estimate) 30

A.I.D. EVALUATION SUMMARY - PART II

SUMMARY

J. Summary of Evaluation Findings, Conclusions and Recommendations (Try not to exceed the three (3) pages provided)

Address the following items:

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

Mission or Office:

USAID/Honduras

Date This Summary Prepared:

September 20, 1989.

Title And Date Of Full Evaluation Report:

Project Evaluation - Irrigation Development Project in Honduras - August, 1989

1. Purpose of the Evaluation

The purpose of this evaluation was to assess implementation progress, determine the cause of implementation shortfalls, identify current constraints on implementation, and recommend actions to remove these constraints.

The evaluation team reviewed project documentation, conducted on-site field inspections, conducted extensive personal interviews, and executed economic, administrative and institutional analyses. Specifically, the team's work consisted of the following: a) review of all project documentation ---Project Paper, Agreement, Project Implementation Letters, Semi-Annual Reports, other reports, correspondence and memoranda; b) visits to central and three regional offices, five participating credit institutions, four irrigation construction firms and two agricultural experiment stations; c) interviews with over 100 representatives of the GOH, USAID/Honduras, private banks, project clients and construction companies; and d) execution of four specific analyses for credit, counterpart funding requirements, procurement and economic viability of recommended modifications to the Project Agreement.

2. Purpose of the Project

Agriculture contributes over 30% of the Honduran GDP, employs 60% of the country's economically active population, and accounts for two-thirds of foreign exchange due to exports. The vitality and expansion of agricultural sector production has a direct and dramatic impact on the economic health of Honduras. A critical impediment to increasing agricultural production and productivity is the underdevelopment of the country's irrigation potential. This potential can only be fully realized through the construction of irrigation infrastructure, and provision of the accompanying technical assistance to producers in on-farm water management to facilitate efficient use of the infrastructure. The Irrigation Development Project is addressing this problem by supporting increased farmer productivity and production through the provision of irrigation technology and on-farm technical assistance. This increased agricultural productivity will strengthen the Honduran economy by increasing farmer incomes, providing greater foreign exchange earnings, and helping to decrease the trade deficit.

3. Findings and Conclusions

The team confirmed the basic validity of the project objectives but found that the project is significantly short of the implementation targets projected by the PP for the period of the evaluation (9/86 - 5/89). The report cites the following shortfalls: a) number of beneficiaries assisted was 31 instead of the targeted 794, b) agricultural production with irrigation was 268 metric tons instead of 15,300 metric tons, c) productivity was increased 25% less than projected, d) 5 irrigation systems were constructed on 49 hectares instead of 159 systems on 1,437 hectares, and e) credit disbursements for irrigation construction and crop production was \$209,177 instead of \$2.5 million. The report also indicates that the project is not reaching the subsistence level farmer due to the commercial orientation of the credit mechanism which requires substantial collateral and effectively eliminates the campesino farmer.

The team determined that these shortfalls were due to: a) inadequate GOH project management and administration; b) inadequate technical assistance (especially in planning and project organization); c) ineffective USAID/Honduras supervision; and d) overly ambitious implementation targets. The failure to reach the campesino farmer was attributed to changes by USAID/Honduras in the credit mechanism to require collateral instead of following the PP design to provide public sector guaranteed credit to project participants. However, the evaluation team noted significant implementation progress during the last year and indicated that most of the management constraints have been addressed.

The team was tasked with the following:

- I) Review the project design and determine how the operational setting is affecting the way in which the project is being implemented. This included assessing the impact on the original design of implementation delays, credit policies, WRD institutional weakness and other constraints. This review also assessed the ability of the project to reach the PP defined project beneficiary groups and the importance of various beneficiary groups in attaining the project purpose;
- II) Review implementation progress and identify shortfalls in attaining output targets, and propose realistic targets;
- III) Determine the cause(s) of identified shortfalls in output targets, assess the current situation regarding circumstances which continue to constrain project implementation and/or prevent the project from reaching planned beneficiaries;
- IV) Based on the above analyses, provide USAID/Honduras with a set of recommended alternatives for resolution of implementation problems. The following alternatives were considered: i) continuing as is; ii) reprogramming activities within basic project structure; iii) revising project via a PP supplement and changes to Annex One the ProAg; or iv) shutting the project down. Alternatives should include concrete changes at the input level (i.e., technical assistance, credit, GOH resources and organizational support) and at the output level (i.e., number of irrigation systems designed and constructed, amount of credit disbursed and appropriate institutional changes).

The final evaluation report indicated that the most feasible course of action was to continue the project but with revisions to the ProAg and Annex One.

4. Principal Recommendations

The team recommended continuing the project but with the following actions as specified in Alternative IV:

- a) Amend Project Agreement and PP Logframe goal and purpose output targets by reducing the number of families assisted from 3,000 to 1,731, and the area of irrigation systems constructed from 6,000 hectares to 3,000 hectares.
- b) Amend project budget to allocate funding for a subsistence farmer irrigation construction and operation program (\$650,000 for 540 hectares of irrigation over a four year period), and add funding for continued technical assistance past the current Winrock contract termination date (135 person months of technical assistance at a cost of \$1.86 million). The provision of local technical assistance would be contracted on a work order basis with local private consultants.

- c) Identify and execute changes in the project's credit mechanism to allow more rapid approval and disbursement of credit.
- d) Execute an administrative assessment of project personnel and organizational structure, and take recommended measures to ensure maximum administrative and managerial efficiency.
- e) Conduct joint planning and execution of activities to re-incorporate WRD into project activities starting in 1990, and develop a long-term strategy for phasing project personnel and material into WRD by the 9/93 Project Assistance Completion Date.
- f) Provide technical support to MNR (Ministry of Natural Resources) for promoting passage of National Water Law; provide required technical assistance to finalize the National Irrigation Plan; establish review/monitoring checks and balances to ensure high quality of irrigation system design; and establish credit and land tenure mechanisms to increase the number of potential beneficiaries.

5. Lessons Learned

The following lessons were identified by the evaluation team:

- a) Sufficient time should be allowed for compliance with condition precedents to initial disbursement before scheduling major implementation achievements;
- b) Technical assistance team leadership should be assigned to individuals with proven managerial experience; and
- c) There should be continuity and stability in AID project management during the early stages of project implementation, and AID direct procurements should be expedited to avoid long procurement delays.
- d) Project design should not over estimate the receptivity of project beneficiaries and the disposition of key institutions (e.g., the private banks) to participate in the project. Also, goals should be realistically established.

ATTACHMENTS

K. Attachments (List attachments submitted with this Evaluation Summary; always attach copy of full evaluation report, even if one was submitted earlier; attach studies, surveys, etc., from "on-going" evaluation, if relevant to the evaluation report.)

- Attachment A: Outline of Basic Project Identification Data
- Attachment B: Project Paper Logframe
- Attachment C: Complete List of Recommendations
- Attachment D: Final Report - Project Evaluation of Irrigation Development Project (522-0268) in Honduras

COMMENTS

L. Comments By Mission, AID/W Office and Borrower/Grantee On Full Report

The final report of the Irrigation Development Project Interim Evaluation satisfies the demands of the scope of work. Implementation progress was assessed, causes of implementation shortfalls were determined, constraints identified, and actions recommended to resolve these constraints. The team's evaluation methodology was sound and they spent adequate time in the field and in personal interviews to develop their findings and recommendations. The team's analyses were well executed and the Mission accepts the findings and recommendations with one exception.

The Mission does not agree with the final report's analysis indicating a need to reduce goal and purpose output targets, nor with the team's recommendation to add \$1.86 million in additional funding to the project for technical assistance. The issue here may be one of timing more than anything else. The team did not have an opportunity to witness the credit mechanism come into full operation in June, July and August of 1989, and were thus unable to take into account the average size of irrigation systems being funded and constructed under the project. This has a bearing on their recommendation to reduce the area of irrigation to be constructed from 6,000 hectares to 3,000 hectares since they made this recommendation by calculating average irrigation system at 15 hectares per system. The eight systems constructed during this period have an average size of 44 hectares per system, and 17 additional systems have been designed and received preliminary credit approval for construction before 12/89 with an average size of 26 hectares per system. Indications are that this trend will continue with the average irrigation system having an average area of at least 30 hectares. By using this average system size, calculations demonstrate that 6,000 hectares of irrigation systems will be constructed by the PACD. Regarding additional funding for technical assistance, sufficient funds can be re-allocated within the current project budget to fund the additional TA needs.

This evaluation is the final step of a continuing effort by USAID/Honduras to resolve implementation problems in the project. The Mission was aware of the most urgent factors affecting project implementation and took actions to resolve these problems. The positive result of these actions was acknowledged in the final report in the discussion of the substantive implementation progress realized in the project since 6/88. The project is on a sound track and is realizing substantial implementation gains. By acting upon the final report's recommendations, the Mission expects to achieve the original projected output targets and to be fully implemented by the PACD of 9/93.

ATTACHMENT A

OUTLINE OF BASIC PROJECT IDENTIFICATION DATA

1. COUNTRY: Honduras
2. PROJECT TITLE: Irrigation Development
3. PROJECT NUMBER: 522-0268
4. PROJECT DATES:
 - a. First Project Agreement: 9/86
 - b. Final Obligation Date: FY 9/92
 - c. Most recent Project Assistance Completion Date (PACD): 9/93
5. PROJECT FUNDING: (amounts obligated to date in dollars or dollar equivalents from the following sources):

a. A.I.D. Bilateral Funding (grant and/or loan)	US\$ 14,090
b. Other Major Donors	US\$ -.-
c. Host Country Counterpart Funds	US\$ 5,100
Total	<u>US\$ 19,190</u>
6. MODE OF IMPLEMENTATION: AID Direct Contract/Winrock International.
7. PROJECT DESIGNERS: Government of Honduras and USAID/Honduras
8. RESPONSIBLE MISSION OFFICIALS:
 - a. Mission Director(s): Carl Leonard (Acting) 9/86 to 11/86
John Sanbrailo 11/86 to present
 - b. Project Officer(s): John Warren 9/86 to 11/87
Robert Wilson 11/87 to 5/88
Craig Anderson 6/88 to 2/89
Mike Maxey 5/88 to present
9. PREVIOUS EVALUATION(S): None

ATTACHMENT B

LOGICAL FRAMEWORK

Page 1 of 4

Irrigation Development Project

NARRATIVE

Goal: Enhance the earning potential of Honduran farmers and contribute to the AID target of increase in agricultural production of \$400 million by 1990.

Purpose: Improve farmer productivity and production through the provision of irrigation technology.

OBJECTIVE VERIFIABLE

Average yearly contribution of \$5.0 million/year to agriculture production from project.

Conditions that will indicate purpose has been achieved: EOPS

1. Irrigation System Construction:
 - Approximately 600 systems constructed/rehabilitated
 - Approximately 350 contracts between the beneficiaries and private sector construction firms signed and honored
2. Credit:
 - A self-sustaining system for medium term investment and short-term production credit in place which include positive, market interests
 - Approximately 3,000 investment loans made by the LOP
 - Approximately 7,000 production loans made by the LOP
 - Aggregate loan recovery rates of more than 90 percent

MEANS OF VERIFICATION

- Central Bank Reports
- CONSUPLANE reports
- Project reports
- NBCCA tracking system

- Project monitoring
- Periodic evaluations
- DRH records
- PMC contract reports
- Periodic site visits

- Periodic project evaluations
- Central Bank records
- Records of participating private banks
- Regular project monitoring

IMPORTANT ASSUMPTIONS

- Continuation of the democratic process
- Central American regional political stability
- Domestic and international markets for cash crops will continue to develop

1. Irrigation System Construction
 - Beneficiary receptivity to technology
 - Continued private sector/public sector cooperation in promoting Honduran development
 - Positive private sector construction company response to construction opportunities

2. Credit:
 - Central Banks capable of negotiating trust fund terms with private banks
 - Commercial banks continue to be interested in development lending
 - Rates to final borrowers are within the borrower's means
 - Banks will take the necessary measures to assure loan collection

Attachment B

LOGICAL FRAMEWORK

Page 2 of 4

Irrigation Development Project

NARRATIVE

OBJECTIVE VERIFIABLE

3. On-farm Water Management:
 - Minimum 15 percent increase in farm income among participants
 - Minimum of 2,500 farmers trained/assisted in on-farm water management
 - Significant crop diversification among participant
 - Significant increased demand for agriculture inputs
 - Productivity increase of at least 50 percent

4. Institutional Development:
 - An effective public sector system in place for carrying out irrigation planning and the management of water resources
 - An effective system of Water User Groups in place to carry out systems maintenance and water use functions
 - Enhanced private sector capacity to plan and construct irrigation systems

MEANS OF VERIFICATION

- Project monitoring
 - Periodic evaluations
 - DRH records on field visits and training interventions
-
- Periodic project evaluations
 - Normal project monitoring
 - DRH records
 - Field visits
 - Construction supervision
 - Reports of T.A. team members
 - Reports on participant trainees
 - USAID/Honduras controller records on disbursement systems

IMPORTANT ASSUMPTIONS

3. On-Farm Water Management:
 - No severe or prolonged weather or other environmental conditions occur which affect agricultural production
 - AID financed domestic marketing project comes on stream as planned in FY 87
 - Technical assistance is available in a timely fashion
 - Participants are receptive to the offered technologies
 - Paratechnicians candidates are available as needed

4. Institutional Development:
 - GOR willing and able to change role of DRH to "regulatory" rather than system construction
 - Private sector construction companies adapt to the "irrigation system construction"

Attachment B

LOGICAL FRAMEWORK

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Irrigation Development Project

<u>NARRATIVE</u>	<u>OBJECTIVE VERIFIABLE</u>							<u>MEANS OF VERIFICATION</u>	<u>IMPORTANT ASSUMPTIONS</u>
	<u>Magnitude of Outputs:</u>								
	1 yr.	2 yr.	3 yr.	4 yr.	5 yr.	6 yr.	7 yr.		
Outputs:									
1. Irrigation System Construction:									
- Number of Systems constructed	25	48	75	92	100	106	114	- Periodic project evaluations	- Sufficient interest by construction firms
- Number of construction contracts signed	4	36	50	60	70	80	80	- Consultants reports - Project monitoring	- Prequalification of construction firms done on a timely basis
2. Credit:									
- Trust account established with Central Bank			One all years						
- Participating Private Banks		2	(12) = 4 over balance LOP						
- Number of investment loans made	40	200	610	510	760	570	570	- Periodic project evaluations - Consultants reports - Project monitoring	- Trust accounts established with commercial banks on a timely basis - Sufficient private bank interest exists for involvement with the trust mechanism
- Number of production loans made	100	600	1040	1100	1100	1400	1500		
3. On-farm Water Management:									
- Site visits to participating farms	108	288	486	552	654	804	924	- Periodic project evaluations - Project monitoring	- farmer interest in participating in program - Suitable technological packages available - Media willingness to cooperate
- Training (short courses and seminars)	1	3	5	6	7	8	9		
- Field days	1	3	5	6	7	8	9	- DRH reports - Consultants reports - Site visits	
- Radio slots	52	52	52	104	156	208	260		
- Newspaper messages	52	52	52	52	52	52	52		
4. Institution Building:									
- Construction companies trained	8	-	8	-	-	-	-	- Periodic evaluations - Project monitoring	- Trainees available - Training T.A. available in a timely fashion
- DRH professionals (Water level Training)	5	5	4	-	-	-	-		
- DRH short-term training (Number trained)	-	4	6	10	10	-	-	- DRH reports	
- Paraprofessionals trained	9	6	6	-	-	-	-		
- Student graduates trained	3	3	3	-	-	-	-		

Attachment B

LOGICAL FRAMEWORK

Irrigation Development Project

<u>NARRATIVE SUMMARY</u>	<u>OBJECTIVE VERIFIABLE INDICATORS</u>							<u>MEANS OF VERIFICATION</u>	<u>IMPORTANT ASSUMPTIONS</u>
<u>Inputs:</u>	<u>Magnitude of Inputs</u> (US\$000)								
	1 yr.	2 yr.	3 yr.	4 yr.	5 yr.	6 yr.	7 yr.		
1. AID									
a. Grant									
- Construction	850	1150	1150	1150	200	200	210	- AID Controller's records	
- Institutional Strengthening	-	30	40	50	60	90	120	- Project semi-annual reports	
- Project Liasion Officer	60	60	60	60	-	-	-	- GOH financial records	
- Audits and Evaluations	-	30	-	30	-	-	60		
- Contingency			200						
b. Loan									
- Construction	400	200	470	400	600	800	1000		
- Credit	-	500	1500	2000	2500	2500	2500		
- On Farm Water Management	-	60	70	105	105	120	80		
- Institutional Strengthening	300	100	300	100	100	100	130		
- Contingency									
2. GOH									
a. In-kind									
- Construction	35	35	35	35	35	35	35	- USAID Controller's records	
- On Farm Water Management	30	60	75	100	200	250	285	- Audits	
- Institutional Strengthening								- GOH records	
b. Cash									
- Production Credit	30	150	200	300	400	450	470		
- On Farm Water Management	50	100	150	200	300	400	500		
- Institutional Strengthening	100	200	400	500	600	800	820		

COMPLETE LIST OF RECOMMENDATIONS

A. REGARDING THE PROGRESS MADE UNTIL MAY 1989

ACTION NO.1
USAID - 2/90

1. The Project did not reach its objectives and goals contemplated in the original design for the period 1986-89. The number of beneficiary farmers with increased income was 31 instead of 794; the production with irrigation was of 268 MT instead of 15,3400 MT; the overall productivity, although it came close, was a 25% lower; five irrigation systems were constructed on 49 hectares instead of 159 on 1,437 hectares; the approved credit was in the amount of US\$209,177 instead of US\$2.5 million; and US\$7.6 million were spent or committed. The causes for these results were various, but the most important one seems to have been the long delay the Project had for its implementation which, in turn, seems to have been due to the deficient direction and administration; the inadequate technical assistance in the organization and planning; and the confused and ineffective supervision by AID which the Project had during the period August 1986 - June 1988. The original design of the Project, due to having been too ambitious, did also contribute to these differences between the projections and the achievements.

Notwithstanding the causes, these results indicate that it is necessary to analyze if it is worth or not to continue with the Project. For this, 4 different alternative were analyzed, presented below and in Annex 14 with their respective developments.

Alternative I. To discontinue the Project.

Alternative II. To continue the Project in its present form, within the structure of the original design.

Alternative III. To continue the Project with modifications to the original design, incorporating the DGRH into the drafting of the feasibility studies and the execution of subprojects of micro-irrigation, maintaining the present technical-operational capacity and replacing the AGROTECNIA personnel at the end of its contract in June 1990 with consulting services of the private sector.

Alternative IV. To continue the Project with modifications to the original design, incorporating the DGRH into the drafting of the feasibility studies and the execution of the subprojects of micro-irrigation, maintaining the present technical-operational capacity of the Project, replacing the AGROTECNIA personnel at the end of its contract in June 1990 with consulting services

of the private sector and considerable speeding-up of the credit approvals.

ACTION NO.1
USAID - 2/90

The results of the analyses show that only Alternative IV is feasible from a technical, operational, economic and financially point of view and that, therefore, it should be adapted. Alternative IV is realistic but it requires a great effort and speeding-up of the credit approval, an element that is the key to the Alternative. It requires a budget of US\$24.5 million for the remaining 4 years and it can be executed without major managerial or technical changes.

The adoption of this Alternative would probably require a modification of Annex I of the Agreement. It would further require (a) to integrate the DGRH into the Project to work with the agricultural producers of limited recourses; (b) to adequate the direction sand administration to the new situation to deal with consultants of the private sector at the end of the AGROTECNIA contract; (c) to strengthen the regional offices; (d) to place the credit system into the hands of specialist with high "promotional" capabilities; (e) to restructure the current technical assistance, both foreign and domestic; and (f) to redefine the part of the AID Project Officials with the purpose that they become true guides, suppliers and supervisors of the Project.

Under Alternative IV, the Project would again be on the road to assist farmers who own lands of less than 5 hectares, which would be carried out through the DGRH by means of the creation of a system similar to the one the Direction is managing with the FAO Project and BANADESA. In this respect, the situation of this system was analyzed and it was found that its results were acceptable. This Analysis is presented in Annex 10.

B. REGARDING THE ADVANTAGE OF CONTINUING THE PROJECT

ACTION NO.1
USAID - 2/90

2. At this time, the Project counts with the physical and logistical infrastructure that it was able to implement with much effort during the analyzed period. Its execution has considerable improved since 1989; it has strengthened the action of its regional offices; it has made work its credit system; it has raised the morale of its personnel; and it has achieved the first concrete results of constructing irrigation systems, of credit approval by the commercial banks, and of generating agricultural production with irrigation.

Based on all of these examples of and improved execution of the Project and on the results of the analysis of

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Alternative IV, it is recommended to continue with the execution of the Project, under the structure recommended in Alternative IV.

C. REGARDING THE AID STRATEGY FOR THE AGRICULTURAL SECTOR

N / A

3. In accordance with the document of strategy for the Agricultural Sector of Honduras, which is being discussed with AID, the Agricultural Sector has grown at a rate of 1.5% during the period 1980-87, which is much lower than the population growth rate which was of 3.4%. As a result thereof, the document indicates that the average nutritional levels are lower than those of 1970. In order to overcome this situation, the strategy recommends to improve the efficiency of utilization of the basic resources, among them the agricultural terrains. In order to improve the agricultural lands it considers important, among others, that there be carried out irrigation programs. Within the context of this strategy, it is found that the objectives of PRORIEGO, which are of increasing the agricultural productivity and production by means of irrigation, are well oriented.

D. REGARDING CREDIT

ACTION NO.2
GOH - 3/90

4. The implementation of the credit system of the Project was substantially delayed, especially because of the time it took to produce the Tripartite Management Agreement and the Credit Regulations, which was of 23 months. The causes for the delay were due to the inexperience of the negotiators in credit matters, who let time go by in long and unproductive meetings as to analyses, discussion and revision of the legal instruments of the system.

5. Starting in January 1989, the system started to operate and at present, 7 banks have already joined it; 4 credits were approved and the approval of other 14 is being processed. The implementation of the credit system is mainly due to the work of the Credit Consultant, who started his work in October 1988.

6. In order to speed up the granting of credit, the Project decided to direct its credit system to clients who could qualify as "credit[worthy] subjects" by the commercial banks. This excluded from the Project the farmers of scarce resources who were, in accordance with the Agreement, the main beneficiaries of same, and the small and medium-scale farmers, both individuals and associates, who did not have the possibility of being qualified as credit[worthy] subjects by the commercial banks.

7. The credit system of the Project is currently in operation, somewhat slow, but with signs that it is taking hold. According to talks held with bank executives, the instruments of the credit system are adequate and the credit conditions (interest rate, risk margin, terms, securities) therein contained do not present any problem for a smooth operation under the present conditions, with the type of customers dealt with. A change in Section 6.01 of Article VI of the Tripartite Agreement and a change in Section 10.4 of the Operational Agreement of the Credit Component could facilitate that more banks join the system, and speedier, but it is not essential to make these changes.

8. To consolidate the achievements to this date, and to strengthen even more the functioning of the credit system, it is recommended to the Project: (a) to assign the management of the credit component to a credit specialist having great promotional qualities; (b) to pressure more actively the operations with the banks; (c) to train credit officers, two in the main office and one in each of the regional offices; (d) to train economists in the methods of profitability analyses that satisfy the criteria used by the commercial banks to evaluate credit applications of subprojects; and (e) to intensify the identification of potential customers by working through farmers' cooperatives.

E. REGARDING THE TECHNICAL ASSISTANCE FURNISHED

ACTION NO.1
USAID - 2/90

9. As of June 1989, the Project had received a total of 550 man/month of technical assistance through consulting firms and independent consultants, both foreign and domestic. Judging from the results obtained, the few finished individual tasks and the limited technology transferred, it can be concluded that the technical assistance, although it generally fulfilled its terms of reference, did not have the expected effect, nor did it cover all the areas in which the Project required assistance, such as direction and administration, credit, and the preparation of adequately focussed projects.

In order to continue with the Project it is recommended to reshape the technical assistance in the manner indicated in Chapter VI; which is in accordance with the modifications recommended for the original design of the Project under Alternative IV.

F. REGARDING THE WATER ACT

ACTION NO.5
GOH - 12/90

10. The Water Act is under study in the Commission of Natural Resources of the Congress. It is expected that it will be promulgated in October 1989. At this time, there is not possibility to anticipate the manner in which it will be approved. In the meantime, it is recommended that the Project insist with the Ministry of Natural Resources to achieve the approval of the drafts of the legislative decrees of temporary duration, which were recommended by a foreign consultant of the Project. The legislative decrees propose (a) the creation of a so-called "authorization" for the use of water up to 5 years by the farmers who are interested in irrigation, which would be granted by the Ministry of Natural Resources. This would eliminate the obligation of the contract, a formality which requires the approval of the National Congress; and (b) the modification of various articles of the law in force.

G. REGARDING THE NATIONAL IRRIGATION PLAN

ACTION NO.5
GOH - 1/90

11. The drafting of the National Irrigation Plan, with the understanding that it has to be an instrument that establish objectives, quantified goals, location, investments, etc. of the activities of public and private irrigation activities in the country, is premature. In its place it is recommended that the Project assist the DGRH in the drafting of a "Master Plan" which would give institutional, legal, technical and economic "guidelines," and establish the pertinent restrictions to manage the development of the irrigation activities in the country.

H. REGARDING THE DGRH AND THE LIFE OF THE PROJECT AFTER 1993

ACTION NO.4
GOH - 3/90

12. The Project, as a project per se, has a duration that is limited by its objectives, its institutional and legal framework, and its budget. In 1993, it has to be reincorporated into its original entity, the DGRH of the SRN. So that this be carried out with the maximum possible efficiency, and so that not all the trained personnel and acquired technology be lost, the Project has to start to establish a closer working relationship with the DGRH and its regional offices. On one hand, it must improve the current communication lines, allowing that the DGRH representative at least be present at the meetings of the Technical Committee of the Project; on the other hand, it must start, as of the next Action Plan, to program joint actions to be carried out during the year. With such a method, to be repeated year after year, the Project could be gradually reincorporated into

he DGRH until 1993. In order to ensure its financial feasibility as of that moment, the Project should consider to start a fund in the Banco Central of Honduras based on a percentage of the recoveries of the loans which, in the case of the actual line, were deemed to be rather extensive. See calculation in Annex 15. A detailed discussion of this topic is presented in Chapter VII.

I. TO IMPROVE THE EXECUTION AT SHORT-TERM

While the authorities of the Project reach the decision whether or not to adopt Alternative IV, which is recommended in the report to continue the Project, it is necessary that some aspect be adjusted in order to improve the execution at short-term. The following is recommended in this respect:

To improve the Project direction and management:

ACTION NO.3
GOH - 3/90

13. That the National Project Direction revise the number, make-up and performance of the support personnel of the Project in order to reduce it to a number more adequate for the requirements of the Project. Also, that it start a on-the-job training plan for the support personnel the will remain, mainly of that of the main office.

14. That the National Project Direction and the AID Liaison Officer create a special fund within the Project budget so that the National Director, with the authorization of the AID Project Director, may use it to hire short-term personnel when it is necessary and if there are no other timely means to do it.

15. That the National Project Direction strengthen the functioning of the regional offices, furnishing them the following, according to the requirements of each:

- An assistant for the tabulations and calculations.
- A second engineer to supervise the work.
- More petty cash and faster restitution.
- Updated information of the costs for sprinkler and seepage systems.
- Light instruments for field survey tasks and quick studies, such as engineering compasses, compensated altimeters, eclimeters, podometers, furrow gagers, small hoists, drills, field permeameter, portable field equipment, tensiometers, etc.
- Timely materials and supplies, with sanctions in the case of noncompliance.

16. That the National Project Direction expedite at all times the payment of salaries to the employees, especially of the regional offices, in order to avoid situations in which the employees are not paid for lengthy periods of time.

To increase the number of potential beneficiaries:

ACTION NO.5
GOH - 3/90

17. That the National Project Direction make all efforts that INA create and regulate a fast system to grant title to owners of farms of less than 3 hectares that wish to install irrigation systems, in accordance to the provisions of the Loan and Grant Agreement, which is of legal force.

18. That the Project continue to absorb the cost of the studies until the Project is well supported or until the moment at which it starts to operate with consultants of the private sectors. At this time, the cost must be considered an incentive for the customer and a means of promotion for the Project.

To improve the drafting of agricultural plans

ACTION NO.5
GOH - 3/90

19. That the National Project Director establish with the Director General of Agriculture of the SRN a system to define better the crops, yields and prices anticipated in the areas in which the Project operates.

20. That those in charge of the cultivation plans of the subprojects consult the plans, strategies, policies and laws of incentives in force for a better focus of their recommendations on the cultivation patterns on the farms.

21. That those in charge of the agricultural production with irrigation of the Project improve the cultivation guidelines with feedback of the information on production of the subprojects that are implemented and operating.

22. That those in charge of drafting the projections of production of the farms be more conservative in the yields of crops and in the ripening periods of the yields they are using at present.

23. That those in charge of the technical assistance in agricultural production and water management be in closer collaboration with their counterparts in the regional offices for the drafting of the cultivation and water management plans of the subprojects.

24. That the National Project Direction study the feasibility of installing demonstrative tracts of land to

verify information on the validity of the technological packages.

To improve the quality of the feasibility studies

ACTION NO.5
GOH - 3/90

25. That the foreign technical assistance supervise from closer the preparation of the subprojects and furnish the methodology and focus to draw them up.

26. That those in charge of the design of the irrigation systems prepare a better analysis of the capacity of the water sources and a brief study of the impact of the subprojects on the ecology.

27. That those in charge of the design of the irrigation systems prepare a more thorough study on drainage, especially in the projects of irrigation by gravity.

28. That the foreign technical assistance review the finished studies and, whenever necessary, discuss any modification with the authors of the design.

29. That the economists of the Project who analyze the profitability of the subproject drop the routine analysis they are performing now and that they adapt their analyses to the requirements of the farmers and the banks. (For example: neither the farmer nor the bank are interested in the internal return rate. They are more interested in other things related to the effective use of the working capital, the cash flow, the break-even point, securities, etc.)

To speed up and energize the construction

N / A

30. That the National Project Direction maintain a very close supervision of the work of the credit component, observing the performance of its new director. It has to be remembered that the credits have to be approved before the constructions of the irrigation systems can be carried out and if this does not happen, it is possible that construction can be delayed.

31. That the National Project Direction allow the construction of irrigation systems by independent builders if it should be beneficial to the farmer or the subproject.

To improve the relationship with the DGRH

ACTION NO.4
GOH - 3/90

32. That the National Project Direction and the DGRH agree on the establishment of a system through which, as of the forthcoming 1990 Action Plan, they both set forth

concrete, joint work objectives and goals.

33. That the National Project Direction and the DGRH start to draft an understanding so that, as of 1990, the DGRH start to carry out a program of micro-irrigation subprojects.

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I. BACKGROUND

On August 29, 1986, the Government of Honduras, represented by the Department of Natural Resources, and the Government of the United States of America, represented by AID, signed a Loan and Grant Agreement to carry out the Irrigation Development Project in Honduras at a cost of \$32.9 million over a period of 7 years.

The DGRH was commissioned with the execution of the Project. The implementation started as of that date and the Project is currently in its third year of same. In order to assess the progress of the execution and to make changes which would allow to improve it, the Agreement contemplated the carrying out of 2 interim and one final evaluations. The interim evaluations should be conducted at the end of the second and fourth years of performance, and the final evaluation at the conclusion of the Project.

This document contains the results of the first interim evaluation of the Project. Consultora DDS., INC. was commissioned by AID with said evaluation, by means of Contract No. 522-0268-C-009381-00 and pursuant to the Terms of Reference presented in Annex I. This evaluation was conducted by three international consultants of ample experience in the design, execution and assessment of agricultural projects, irrigation projects, water and soil management, and agricultural production under irrigation. The evaluation was conducted in Honduras from May 22 to June 30, 1989. Subsequently, based on the comments to the document, made by USAID/Honduras, the consulting firm made the pertinent modifications and corrections.

II. INTRODUCTION TO THE DOCUMENT

This report consists of 8 chapters and 16 annexes. Chapter one presents a description of the events and of the contractual conditions that led to the carrying out of the evaluation of the Project. Chapter two shows the manner in which the Report is integrated. Chapter three presents an executive summary of the major aspects that were analyzed as well as the conclusions and recommendations of the Report. Chapter four presents a description of the methodology used to carry out the evaluation and the analysis of the results of same. This is the main chapter of the Report since it was also used to draw the conclusions and to present the recommendations. Chapter five presents the conclusions and recommendations regarding the most important aspects of the evaluation. Chapter six presents the modifications the evaluation team recommends for the original design in order to continue with the carrying out of the Project. Chapter seven presents a discussion on the Project, the DGRH, the private sector, and the future of the Project after 1993. The last Chapter eight presents the experiences gained in the execution of the Project until the date of its evaluation. Finally, the 16 annexes illustrate or support some aspects contained in the main body of the Report.

III. SUMMARY

This Report is the result of the evaluation of the "Irrigation Development Project in Honduras" (PRORIEGO), which was conducted in Honduras between May 22 and June 30. It is the first of the three evaluations of the Project, which are contemplated in the Loan and Grant Agreement in order to assess the intermediate and final results of the Project.

The Project, pursuant to the Loan and Grant Agreement executed on August 29, 1986 between the Government of the United States, through AID, and the Government of Honduras, has a lead time of 7 years at a cost of \$32.9 million of which AID contributes 68%.

The Purpose of the Project is to increase the agricultural production and productivity of an irrigated surface area of roughly 6,627 hectares in order to contribute to increase the income of 3,000 families of farmers, the majority of which have low income, educational and nutritional levels. In order to achieve this Purpose, the Project has contemplated the implementation of four components: (a) the design and construction of irrigation systems; (b) the promotion, extension and training; (c) credits; and (d) institutional strengthening.

The Project was carried out in 3 regions of the country: San Pedro Sula, Comayagua and Choluteca. (See map in Annex 2.) Originally it was intended that, as of the third year, the Project be carried out in 7 regions of the country; however, due to the difficulties to initiate it, this became impossible. The organism in charge of the Project was the Direction General of Hydraulic Resources (DGRH); at the beginning, it was in a direct manner and subsequently, through a National Project Director. He was assisted by a technical assistance team, constituted by a pool of U.S. and Honduran consulting firms. In the foreign consulting tasks participated WINROCK INTERNATIONAL, HARZA ENGINEERING CO. and the COLORADO INSTITUTE FOR IRRIGATION MANAGEMENT, while AGROTECNIA SRL. de C.V. participated in the domestic consulting tasks.

Until January 1989 the execution of the Project was characterized by having suffered a well known delay in the progress of its intended goals. It took 28 months to be initiated, mainly due to: (a) the little understanding DGRH had of the importance of the Project until June 1988, which did not allow it to correctly appraise the magnitude of efforts that would be necessary to put it into operation; (b) the delay in the establishment of the credit facility, which took 23 months to be approved; (c) the managerial and administrative deficiencies of the executing organism; (d) the

insufficient technical assistance rendered by the consulting firms to the DGRH for the organization and the initial planning of the of the Project; and (e) the delays in the contracting and acquisitions made directly by AID.

In June of 1988, the DRGH and AID agreed to carry out the Project in an independent manner under the direction of a full-time National Director. The Project moved its offices from those of the DRGH and, starting in January 1989, it began to be implemented within a Work Program prepared with a managerial perspective. On May 31, 1989, the Project had reached the majority of the goals scheduled by the Program for that date for the 4 components, with exception of the amount of the approved credit, which had a delay of 72%. This delay, however, had possibilities to be overcome due to that the commercial banks were actively considering loans for various subprojects, with good perspectives for a total of \$3.9 million.

The results attained by the Project since August 1986 to May 31, 1989, were very much below the goals projected in the original design. Of a goal of 794 farmers, it achieved to benefit 29 small-scale and 2 medium-scale farmers with increased incomes; of a goal of 159 irrigation systems to be installed for 1,427 hectares, it achieved to build 4 systems over a surface area of 491. hectares; and, although close to its goal, the agricultural productivity attained is still 25% below the one projected. In spite of these results, the Project gave well founded signs that it is on its way of recovery; its organizational structure is working, it has 3 regional offices in operation, the credit mechanism is working well, having been integrated 7 banks, and its personnel was trained and is performing in an adequate manner.

Notwithstanding these positive aspects, based on the results achieved until now, the evaluation team deems that at this stage of the implementation it should be studied if it be appropriate to continue the Project or not. Therefore, four alternatives to discontinue or to continue the Project were analyzed and it was recommended to adopt the Alternative IV to continue, adjusting the goals of the original design, incorporating the DGRH into the preparation of feasibility and construction studies of simple micro-irrigation systems, contracting a new outside technical assistance team, and offering opportunities to the consultants of the private sector at the end of the AGROTECNIA contract in June 1990 to participate in the preparation of feasibility studies for the irrigation subprojects. This alternative contemplates, among its main objectives and goals, to benefit in the remaining four years of implementation of the Project a maximum of 1,731 families of farmers, to irrigate a total of 3,040

hectares, to prepare 120 annual studies (60 by PRORIEGO and 60 by DGRH), to annually build 85 irrigation systems (40 by PRORIEGO and 45 by the DGRH) and, above all, grant a total of US\$13.3 millions in loans. The cost of implementing this Alternative would reach US\$24.5 millions which, added to the US\$7.6 millions already spent and/or committed until May 1989, would result in a total of US\$32.1 millions. The analyses of this Alternative have shown that it is technically, financially and economically possible.

In addition to this important recommendation it is also recommended that, while decisions are taken on the adoption of Alternative IV, some administrative and operational modifications be made in order to improve within a short time the carrying out of the Project. Among them, it is recommended that the staff of the support personnel of the Project be reduced, specially of its main office, and that the remaining personnel be better trained and equipped; that there be created the mechanism with INA to take title of the lands with less than 5 hectares of the clients of the Project; that with the Direction General of Agriculture be coordinated a better definition of the crops, prices, yields, etc. of the areas in which the Project operates; the communications with the DGRH be improved, etc.

In respect to this last recommendation it was further suggested that, in view that the Project has a limited life for its objectives and budget, wherefore it would have to be reincorporated into the DGRH at the conclusion of its implementation, it would be important that the reincorporation be programmed in the annual work schedules in order to be more efficient. This would mean that the Project would have to assist the DGRH in its institutional strengthening so as to be able to be integrated in 1993 into one of its units specialized in regulating, planning, carrying out and supervise the irrigation activities in the country.

In respect to the part by the private sector, it was recommended that the Project allow the participation of private consultants for the preparation of feasibility and implementation studies for irrigation subprojects, starting at the end of the technical assistance contract with AGROTECNIA in June of 1990. In other capacities, be it as producers, suppliers, builders and/or financial backers, the private sector has already at present full freedom of participation in the activities of the Project.

IV. PROJECT EVALUATION

A. METHODOLOGY AND SCOPE OF THE EVALUATION

The project evaluation was conducted in order to assess the progress obtained in the execution of the Project from August 1986 to May 1989, that is to say, for the period of 33 months elapsed since the execution of the Loan and Grant Agreement. The methodology applied in the evaluation corresponds to that of the Project Management System (PMS) within which the Logical Margin is the main instrument.

According to the PMS methodology, an "evaluation" seeks to establish if a project has attained its Purpose or if it is progressing in a manner adequate to achieve it. Therefore, when a project is evaluated, first it has to be assessed if it has achieved its purpose or if its progress is directed toward it. During the process there will be examined: if the scheduled Products and their goals were accurately structured and appraised; if the Budget was used to its fullest extent and if the important Assumptions had any negative affect on the execution of the project. Finally, by means of the analysis of all of these elements is examined the overall design of the project and it is determined if it was adequate or deficient. This analysis has to be conducted with aid of the Logical Margin, which allows to organize in an approximate manner all the important information of a project and to determine if it was adequately structured in the design and if it was adequate for the execution.

Using this methodology, the Project was evaluated and the progress of its execution achieved until May 31, 1989 was analyzed; then were compared the differences between what was achieved and what was projected and the causes that originated the differences were analyzed. Concomitantly, there was analyzed the Institutional and Legal Framework within which the Project was executed, and its adequacy was analyzed. Finally, conclusions were drawn and recommendations were offered to continue in the future with the Project.

In order to conduct the evaluation, there was drawn up a Work Program which was discussed with AID and Government personnel; interviews were conducted with the personnel of the participating institutions (Annex 3); work sessions took place; the three Regional Offices of the Project were visited; 8 subprojects and 2 experimental stations were visited; 5 participating credit institutions were visited, the Banco Central de Honduras and the Superintendence of Banks; 4 private construction companies were visited, 2 small AND 4 medium sized ones; the information and of the Project was examined and analyzed (Bibliography in Annex 4); the analyses and studies were made; and the document to be furnished to AID

was prepared. Subsequently, there were made the changes to the document, based on the comments furnished by AID/Honduras.

B. RESULTS OF THE PROJECT EVALUATION

1. INITIATION OF THE PROJECT

The personnel of the Direction General of Hydraulic Resources of the Department of Natural Resources was originally in charge of the initiation of the project. AID participated in its capacity of financial backer, of supplier and supervisory entity for the observance of the provisions of the Loan and Grant Agreement. From August 1986 to June 1988, the activities of the Project were carried out in the offices of the DGRH under poor conditions of comfort. Subsequently, in June 1988, the Project moved to its current offices at 2 different locations. During this period, the Associate Director of Hydraulic Resources was in charge of the management of the Project and, concomitantly, he carried his regular functions in the Direction General of Hydraulic Resources. He had the collaboration of the Director of the Department of Irrigation and Drainage, who acted as National Director of PRORIEGO and counterpart of the Consulting Group. Starting in June 1988, after an analysis in depth of the work performed until that moment, and of the serious problems that occurred, both work related and personal, the Project was reorganized and the DGRH appointed a full time National Director.

It took 28 months for the Project to be initiated, from the moment of the signing of the Loan and Grant Agreement in August 1986 until January 1989, when the Project began to be executed within an Annual Work Program, established from a managerial viewpoint and with a remodeled organizational structure. A below chronological listing of the important events that occurred during this period illustrates the course taken by the Project until it was initiated.

Aug. 1986	The Government of Honduras and AID signed the Loan and Grant Agreement.
Sept. 1986	The signing of the Agreement is published in "La Gaceta".
April 1987	The Project asks AID for 16 vehicles and 12 motorcycles.

April/May 87 The Project asks AID for topographic equipment.

April/May 87 AID signs the technical assistance contract with WINROCK.

June 1987 The Project requests from AID the emergency acquisition of 4 vehicles.

July 1987 The Department of the Treasury and Public Credit approves the budgetary structure of the Project, giving it the freedom to make payments against the counterpart funds of \$40,000.00.

Aug. 1987 WINROCK signs the consulting contract with AGROTECNIA.

Aug. 1987 The leader of the technical assistance group arrives in the country.

Sept. 1987 The specialists in agricultural production and in extension and training, and the coordinator of National Technical Assistance join the Project.

Oct. 1987 The Project receives the vehicles of emergency acquisition, requested in June 1987.

Oct. 1987 The specialist in water management joins the Project.

Oct.87/Jan.88 Regional groups are established in San Pedro Sula, Comayagua and Choluteca.

Nov. 1987 AID replaces its Project Manager (Wilson with Warren).

Oct/Dec. 87 GEMAH prepares the 1988 Action Plan.

April 1988 The Project receives partial deliveries of the topographic equipment requested in April/May 1987.

April 1988 The project receives partial deliveries of the office equipment requested in April/May 1987.

June 1988 The government appoints a full time National Director for the Project.

June 1988 The organizational structure of the Project is reorganized and the Executive Committee is created.

June 1988 The Project becomes independent of the DGRH, moving its offices from those of the DGRH to its present locations.

June/Dec. 88 The Project receives 7 vehicles and 12 motorcycles, requested in April 1987.

May 1988 AID replaces its Project Manager (Maxey and Anderson with Wilson) and leaves vacant the position of liaison officer.

June 1988 The Ministry of Natural Resources, the Department of the Treasury and Public Credit and the Banco Central de Honduras sign the Tripartite Agreement for the administration of the credit facility of the Project.

July 1988 AID approves the Condition Precedent 5.2 (c) of establishment of the credit facility, after the deadline, which originally was established for January 1987 was postponed 5 times.

Aug. 1988 The signing of the Tripartite Agreement and of the Credit Regulations was published in "La Gaceta."

Aug. 1988 The Project requests computers from AID.

Aug. 1988 The Project requests office equipment from AID.

Aug. 1988 The Project requests field equipment from AID.

Aug. 1988 The Project requests vehicle spare parts from AID.

Sept. 1988 AID contracts an administration specialist.

October 1988 The credit specialist joins the Project.

Nov. 1988 The Work Program of the Project for 1989 was drafted, using the Project Management System (PMS) methodology.

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- Nov. 1988 The first participating commercial bank joins the Project.
- Jan. 1989 The Project commences to be carried out with a new structural organization, in accordance with the Work Program for 1989.

According to this chronology, the time required to initiate the Project was excessive and much longer than contemplated in the Loan and Grant Agreement which, on the other hand, did not contemplate a more realistic deadline for the launching of the Project. The main reasons for the delay seem to have been: (a) the managerial and technical shortcomings of the executives and technicians of the main executing entity, which did not allow them to fully appreciate the importance and magnitude of the Project and the effort that would be required to carry it out; (b) the shortcomings of the technical assistance, both from abroad and domestic, which did not allow them to duly orient the government personnel in the fulfillment of the condition precedents of the Agreement and in the drafting of a good work program to launch the Project; and (c) the differences of opinion between the members of the National and Foreign Technical Assistance, which originated serious work departures and personal problems.

In addition to these causes, the analysis of the chronology indicates that the launching of the project was delayed because many of the happenstances were delayed in being carried out, among them, several that were beyond the control of the Project Direction and Management, such as, the contracting of the technical assistance, the acquisitions of vehicles and equipment, etc. Among the most delayed events can be mentioned the following:

- The fulfillment of the condition precedent 5.2 (c) relating to the drafting of the Tripartite Management Agreement and the Credit Regulations took 23 months until it was approved by AID. Without this approval the Project could not request "additional disbursements" of funds.
- The team leader and the main members of the foreign and domestic technical assistance came to the Project 12 to 16 months after the launching of same.
- The first urgently requested vehicles were received by the Project 14 months after the launching of the Project.

- The first regularly requested vehicles were received by the Project 22 and 28 months after the launching of the Project.
- The first requested office equipment was received by the Project 21 months after its launching.
- The first requested topographic equipment was received by the Project 21 months after its launching.
- The regional offices were established 17 months after the launching of the Project.
- The credits specialist joined the Project 26 months after its launching.

In conclusion, it was noted that the launching of the Project was delayed too much. The grounds for that seem to have been: the deficient direction and management of the Project furnished by the DGRH, the deficient technical assistance furnished by the foreign and domestic consultants to the Government personnel, in particular regarding management and administration, the insufficient support of orientation and the frequently changing position of the AID officials, the slowness in the procurement of the equipment and vehicles by AID, the inability of those responsible to produce the legal instruments of the credit facility, and the cumbersome initial process to obtain the counterpart budget and the authorization for the contracting of personnel that had to be handled by the DGRH.

In countries with irrigation experience, the launching of similar projects would take between 6 to 18 months. In the case of the Project it took 28 months.

2. CAPABILITY OF THE INSTITUTIONAL AND LEGAL FRAMEWORK WITHIN WHICH WAS CARRIED OUT THE PROJECT.

It could be noted that in practice the Project was carried out within the institutional and legal framework established in the Loan and Grant Agreement as regards the executing entities, the recipient sector, the laws, agreements and accords, the implementation letters and regulations. It was generally found that this framework was beneficial and that it fittingly served the objectives of the Project. However, it was also found that there were major discrepancies in the provisions of the accords, the agreements and contracts, which rendered difficult the management of the Project and delayed to considerable extent its execution. Among them, there can be mentioned the following:

- While in the Loan and Grant Agreement it was established that the irrigation microsystems would be built by the Direction General of Hydraulic Resources and its regional offices, the Project budget did not contemplate a line of specific cost to these effects but rather an amount of \$500,000 for irrigation equipment, the objective of which was not clear at any time to the DGRH, the AID or the technical assistance.
- While the Loan and Grant Agreement contemplated that the majority of the beneficiaries of the Project would be the small farmers of scarce resources and of poor social and economic conditions, in the Tripartite Management Agreement and in the Credit Regulations they were automatically excluded in benefit of those, who had possibilities to be qualified as "credit subjects" by the commercial banks.
- While in the Loan and Grant Agreement it was established that the main executing entity of the Project would be the DGRH, in the technical assistance contract of AID with WINROCK INTERNATIONAL is was established that the joint Technical Assistance [Group] would be the direct responsible for the drafting of the feasibility studies of the subprojects. This practically voided the responsibility of the DGRH to be the main executor and gave rise to the potential of rivalry between the Government personnel and that of the Technical Assistance [Group] which, unfortunately, happened in practice.
- While in the Loan and Grant Agreement it was established that the 100% risk of granting credit would be assumed by the Project and not by the commercial banks, the Tripartite Management Agreement established a 70-30% ratio between the bank and the Project. This automatically excluded the possibility of the small [beneficiaries] that the banks qualify them as credit subjects.
- While in the Loan and Grant Agreement there was established a performance chronogram which contemplated the construction of 25 irrigation systems and the granting of 140 credits during the first year of the Project, in the same Agreement was established the condition precedent 5.2 (c), of very difficult fulfillment during the first year, which would allow the use of the funds of the Project until it be fulfilled.

The elements of the Institutional and Legal Framework within which the Project was executed, are explained hereafter.

2.1 EXECUTORY INSTITUTIONS

The Loan and Grant Agreement contemplated the participation of the following institutions in the execution of the Project: the Direction General of Hydraulic Resources (DGRH) as the main executory entity; the consulting firms, one foreign and one domestic, as technical irrigation consultants; AID as a financial backer, supervisor and supplier; the Banco Central de Honduras as administrator of the credit funds; and the commercial banks and rural development banks as intermediary credit institutions (IIC).

In practice, the following participated: the DGRH as the executing entity of the Government of Honduras; WINROCK INTERNATIONAL in conjunction with HARZA ENGINEERING, COLORADO STATE UNIVERSITY and the Honduran consulting firm AGROTECNIA as the technical consulting institutions; AID, through its Agricultural Office, as the financing institution, supplier and supervisor; the Banco Central de Honduras as the agent in charge of the administration of the funds, and FIA, BANCO SOGERIN, BANCO CONTINENTAL, BANCO DE LOS TRABAJADORES, FICENSA, BANHCAFE and BANCO DE COMERCIO as intermediary credit institutions. The latter joined the Project as of November 1988.

Compared with the provisions of the Loan and Grant Agreement, the only executing institutions that did not participate in the execution of the Project were the rural development banks, specifically BANADESA, which was not included due to being unable to fulfil the qualifying conditions of Section 6.01 of Art. VI of the Tripartite Management Agreement.

2.2 THE BENEFICIARY SECTOR

In practice, the Project basically directed its action to the production of basic grains and horticulture. Thus, it benefitted the agricultural sector of Honduras, such as it was provided for in the Loan and Grant Agreement.

2.3 THE TARGET BENEFICIARY

In accordance with the Loan and Grant Agreement, in the period 1985/1989, the Project was going to benefit 795 farmers and their families, "the majority of which were small-sized, of low income, limited education, poor,

and of deficient nutrition." In practice, the Project benefitted 29 farmers of low income, that were united in 2 subprojects, and 2 farmers of medium income. The first are farmers of scarce resources who use family manpower; the latter are small operators of moderate income who use contracted manpower.

In practice, the Project placed more emphasis on the beneficiary who could qualify as a credit subject of the commercial banks than on the one indicated in the Loan and Grant Agreement. By concrete facts, such as the Tripartite Management Agreement, there was automatically excluded the real target beneficiary of the Project, the farmer of scarce financial and social resources. It is understood that all of this was done in order to liberate more rapidly the credit fund, which had difficulties in being placed.

In respect to the female beneficiaries, the Project conducted 3 feasibility studies to benefit 3 female proprietors of farms with 5.5, 8.4 and 19 hectares under irrigation. The study of one of them was rejected by a bank. The two others continue to be under consideration.

2.4 LAWS, ACCORDS AND AGREEMENTS, IMPLEMENTATION LETTERS, REGULATIONS

In practice, the below laws, accords and agreements, implementation letters and regulations controlled the execution of the Project:

Laws

- Foreign Assistance Act of 1961 and its modifications

Pursuant to the terms of Sections 103 and 531 of this instrument, the Mission Director of AID in Honduras authorized on September 19, 1986, the participation of AID in the Irrigation Development Project.

- Appropriation Law of Honduras

The budget of the Project was prepared and executed pursuant to the "General Provisions" of this law, which are published every year. The provisions are applicable both for the counterpart funds and those for loans and grants. In 1988, it was found that the interpretation of Art. 73 of the General Provisions and the inclusion of the budget in the investment structure No. 530 delayed the execution of the Project. In 1989, the problem was solved when the Project implemented a more adequate budgetary structure, organized by generic

and specific items in accordance with the budget in respect to the expenses. The application of this law does not present a serious problem to the Project in the future, on condition that the due precautions be taken in the preparing of the budgets. Attention will have to be paid, however, to the contracting of personnel due to the time it takes the Bureau of the Budget to render its opinion and, therefore, the time it takes to obtain the signatures of the Secretary and the President of the Republic.

- Civil Service Law of Honduras

This law requires that the employees that are contracted by a public institution be subjected to an analysis of capabilities and experience in accordance with the Civil Service regulations of Honduras. The Project had to submit to the consideration of the Presidency of Honduras the appointments of 111 employees who were contracted to execute the Project. The process in the Direction General of Civil Service, to comply with the provisions of the law, does not present a serious problem for the Project in the future, since the previous experience has shown that the submitted applications were rapidly approved.

- Law of Agrarian Reform

The Law of Agrarian Reform establishes that the smallest family tract of land is of 5 hectares and from this it can be deduced that a family property cannot be titled due to not being economically feasible. However, by means of modifying legislative decree there was established that the coffee-producing lands would not be affected by it, whatever their extension might be. The basis for this was the high income that could be obtained from this crop. The Loan and Grant Agreement took into consideration this precedent and its Article 6 (b) it committed the Government of Honduras to allow that tracts of land of less than 1 hectare up to a maximum that be consistent with the law of Agrarian Reform, improved by irrigation and shown to be economically feasible, be declared as not affected and eligible for title documents. Since the Agreement was approved by the Congress of Honduras, wherefore it has force of law, INA stated to the team of assessors that the Project had to establish the procedure to make feasible the provisions of the Agreement. Up to the date of this evaluation, the Project had made attempts to reach an agreement, including a letter of intent of joint execution of work, but it was unable to realize anything definitive with INA. Since the majority of

the patronage of the Project, in accordance with the Agreement, is of less than 5 ha, it is recommended that the Direction of the Project make a real effort with INA to establish the method and the legal instrument to entitle the beneficiaries of the Project who install irrigation on their farms and who plan to conduct economically feasible agricultural operations. This means that PRORIEGO would have to start to take up with the Congress the interpretation of the terms of the Agreement in view of the provisions of the Law of Agrarian Reform.

- Water Act

This law would have had considerable influence on the execution of the Project but up to this date it has not been promulgated by Congress. In accordance with information furnished by the Assistant Secretary of Natural Resources, it is anticipated that the law will be passed in this session of the legislature until October 1989. The Water Act, such as formulated at present, deems that the water is of public domain; it places the management and control of the water for agricultural use in the hands of the DGRH; it establishes the "permit" and the "authorization" for the use of water, which must be granted by the DGRH; and it connects the water to the land and not to the owner.

Accords and Agreements

"Loan and Grant Agreement"

It was signed on August 29, 1986 and published in "La Gaceta" on September 29, 1986. The Agreement was modified 3 times in order to introduce changes of the cost and financing of the Project. The Agreement is the main legal instrument that must control the execution of the project, but in the case of PRORIEGO it was found that it was not duly consulted by the executors. Many of the problems afflicting the execution can be attributed to the lack of knowledge of its contents by part of the executors.

The Agreement document is not very clear in many aspects, it was poorly translated into Spanish and its Annex 1 does not faithfully reflect many important aspects that are described and analyzed in the Project Document. If Annex 1 of the Agreement would be modified by virtue of the recommendation to adopt Alternative IV to continue the project, it would be important that the contents of Annex 1 be substantially improved.

"Tripartite Management Agreement"

This agreement between the Banco Central de Honduras, the Department of the Treasury and Public Credit and the Ministry of Natural Resources was signed on June 24, 1988 and published in "La Gaceta" on August 27, 1988. By means of this agreement is established the credit system for irrigation of the Project. The document did not originate major operational problems. Only one of its clauses (Section 6.01 of Article VI) was too rigid in its criterion of qualification of the banks, preventing the incorporation of more commercial banks and of BANADESA into the credit system of the Project.

"Operational Agreement of the Credit Component"

This Agreement had the purpose to control the relationship between the Banco Central, the participating bank, and the client, establishing the systems of disbursement and control of the funds. Likewise, it served to define the attributions of the Banco Central and of the Ministry of Natural Resources to be exercised by the DGRH and the Project. Each of the participating banks signs this Agreement but the processing is carried out by the personnel of the Credit Component of the Project. The Agreement served its purpose but its processing was cumbersome due to the fact that its Section 10.4 stipulated that each Agreement had to be published in "La Gaceta," which meant going through an entire process which included the signature of the President of the Republic.

"Cooperation Agreement"

In the Operational Regulations it was required that the client sign a Cooperation Agreement with the Project, wherein were established the obligations to which both parties committed themselves to ensure the success of the subproject, both during the construction period as well as in the operational phase. Up to now, no client who obtained a credit with the funds of the Project had signed this Cooperation Agreement. The signing of this Agreement is not considered important and therefore it is recommended that it be eliminated as a requisite of the Operational Regulations. Instead, there should be established a contract of support between the producer and PRORIEGO, wherein the producer commits himself to observe the technical and legal conditions that control the irrigated agriculture.

Letters of Execution

Sixteen Letters of Execution were signed during the execution of the Project. See the summary in Annex 5. The letters were clear and helped to speed-up the execution of the Project. They were mainly directed to approve the Preliminary Conditions, to clarify the cost items and structure of the budget, to authorize the use of counterpart funds, and to acquire vehicles and equipment.

Regulations

"Regulation of Credit Operations"

This Regulation had the purpose to regulate the credit operations established in the "Tripartite Management Agreement" of the funds of the Project. The impression obtained in the talks with the executives of the participating banks was, that up to this moment the document is adequate and that it has not presented any operational problem. It could be improved but the effort would not substantially add to its usefulness. In order to allow the participation of private consultants in the preparation of the feasibility studies for the subprojects, it is recommended to the authorities of the Project that the clauses of Regulations be reviewed, especially those of Chapter II, in order to eliminate any constraint in this respect.

"Regulation for Revolving Fund"

It controls the use of the two revolving funds with which the Project operates. Its rules are contained in the General Budgetary Provisions. The Regulation was useful and facilitated the operation of the two revolving funds of the Project.

3. PROGRESS IN THE EXECUTION. OBJECTIVES AND GOALS ACHIEVED IN PRACTICE COMPARED WITH THE OBJECTIVES AND GOALS PROJECTED IN THE ORIGINAL DESIGN OF THE PROJECT.

3.1 OBJECTIVE

The objective of the Project after the third year of its implementation (1986-1989), in accordance with the Loan and Grant Agreement, was to contribute to increase the income of 794 families of farmers, the majority of which had very low levels of income, education and nutrition. The amount of the increased income was not specified in the Agreement nor in the Project Document.

In practice, according to the sources mentioned in the footnotes of the table, until May 1989 the Project had contributed to increase the income of 31 farmers, 29 small-scale that joined in 2 subprojects and 2 medium-scale. The increases that were recorded on the farms in the agricultural campaign of 1988/89 were as follows:

Subproject	Agricultural Campaign	Income w/ project	Income w/o project	Increase per farm	No. of farmers
15 de Septiembre	Jun. 88 Dec. 88	3,252	3,289	- 37	14
Rondón del Carmen	Jun. 88 May 88	7,543	2,973	4,570	15
Las Mercedes	Dec. 88 May 89	13,239	2,332	10,907	1
La Guadalupe	Jun. 88 May 89	24,079	17,913	6,166	1

The small-scale farmers that benefitted belong to the subprojects 15 de Septiembre y Rondón del Carmen which were executed in 1988 and to this date they were already able to have 2 cycles of harvests with poor results for the first one due to sanitary problems and with satisfactory results for the second one. Considering the future increases of yield of their crops, these farmers could still raise their income by 10% during the useful life of the project.

The medium-scale farmers that benefitted belong to the subprojects Las Mercedes and La Guadalupe which were executed in 1988 and to this date they were already able to have one cycle of harvest, each with good results. Considering the future increases of yield of their crops, these farmers could still raise their income by 15% during the useful life of the Project.

Based on these results, it can be said that the farmers that benefitted from the Project increased their income to a considerable extent but it is still too early to make extrapolations and predictions in this respect compared with the projected objective.

3.2 PURPOSE

The Purpose of the Project, in accordance with the Loan and Grant Agreement, was to improve the production and the productivity of the farmers. The goals were not stated in the Agreement but through interpretation, reconstruction and analyses of the production and

productivity data contained in the Project Document it could be deduced that the production and productivity goals anticipated by the Project for the 1986-89 period were as follows:

Parameters	85/86	86/87	87/88	88/89
<u>Extension</u>				
	(h e c t a r e s)			
Surface w/o irrigation	6,672	6,504	6,021	5,235
Surface with irrigation	0	168	651	1,437
<u>Production</u>				
	(t h o u s a n d s o f M/T)			
Production w/o irrigation	13.4	13.1	12.2	10.6
Production with irrigation		1.3	6.3	15.3
Total production	13.4	14.4	18.5	25.9
Increase over base year	0.0	1.0	5.1	12.5
<u>Productivity</u>				
	(t h o u s a n d s / h a)			
Overall with irrigation	0.0	7.7	9.7	10.6
<u>By crop</u>				
	Weather Conditions		Irrigation	
- Corn	2.9		5.0	
- Beans	0.8		2.0	
- Rice	2.0		5.5	
- Vegetables	12.0		23.0	
- Soybean	1.3		2.2	
- Melon	4.0		10.0	
- Orchards	13.0		40.0	

In practice, during the 1986/89 period, the Project assisted the farmers with the construction of 5 sub-projects, 4 of which entered into the production phase in 1988/89. Up to this date, these subprojects were able to obtain one or two harvests of various crops. The actual production and productivity results obtained by the subprojects as follows:

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Subproject	Cultivated area (ha)	Productivity (MT/ha)	Production (MT)	Crops
15 de Septiembre	4.7	2.36	11.1	Rice
Rondón del Carmen	3.1	3.86	12.0	Corn grain
	0.5	15.00	7.5	Sweet peppers
	0.5	38.04	19.4	Tomatoes
	0.5	16.42	8.2	Watermelon
	0.13	1.16	0.1	Corn ears
	0.37	4.54	1.6	Corn grain
Las Mercedes	2.1	29.74	62.5	Cabbage
La Guadalupe	11.0	9.41	103.5	Melon
	11.0	3.89	42.8	Corn
TOTAL			268.3	

From this can be deducted that the production obtained in the year 1988/89 in the subprojects assisted by the Project (368 MT) is equivalent to 0.01% of the projected goal of production with irrigation for the same period (15,300 MT). As regards the area cultivated with irrigation, the Project reached 21 hectares, which translates to 0.01% of the goal projected for the 1986/89 period (1,437 ha).

In respect to productivity, the one recorded for rice was 50% lower than the one anticipated due to sanitary problems; for corn grain it was 20% lower and for vegetables and melon it was equal to the one anticipated.

The overall productivity reached 7.9 MT/ha, that is to say, 25% lower than the anticipated one.

The difference between the achievements and what was planned for the 1986/89 period seems to be mainly due to three factors: (a) the incorporation of subprojects suffered a considerable delay due to the lack of the credit system; (b) 124 micro-projects of irrigation with a total area of 372 hectares were not incorporated, as contemplated in the Project Document, despite that it could have been possible if the clauses of the Loan and Grant Agreement had been correctly interpreted and if the DGRH had been furnished with financial resources; (c) it was erroneously assumed that the irrigated lands would constitute per se a sufficient security for the loans by the commercial banks; by obtaining a different result, 20 planned subprojects had to be discarded and the preparation of subprojects for the reformed groups had to be abandoned.

Therefore, the Project could not achieve its purpose projected for the 1986/89 period. It is on its way to it but it is very far from reaching the anticipated level. The achieved productivity was close to the one projected but the overall production lagged because of the slow incorporation into the Project of new sub-projects of irrigation. This means that the Project will not be able to contribute with the US\$20 million anticipated in the "FY 88 Action Plan" of AID to the goal of its US\$400 million of agricultural production for the year 1990, but rather an amount of roughly US\$1.8 to 2.9 million.

3.3 PRODUCTS

Design and Construction

In accordance with the Loan Agreement, the Project contemplated the construction of 604 irrigation systems on an area surface of 6,627 hectares over a period of seven years. During the 1986/89 period it had the intention of constructing 159 irrigation systems on an area surface of 1,437 hectares, such as it can be seen in the below table. The 78% of the work during this period corresponded to the so-called "Micro-Irrigation" of the Project with area surfaces of less than 5 hectares.

Average type	Surface (ha)	1986/89 period		1986/93 period	
		Constr. (ha)	(ha)	Constr. (ha)	(ha)
Micro-irrigation	1-5	124	372	424	1,272
Small irrigation	6-50	23	345	121	1,815
Medium irrigation	50-150	8	480	39	2,340
Drainage	60	4	240	20	1,200
TOTAL		159	1,437	604	6,627

Source: Project Document

In practice, up to May 31, 1989, the Project had prepared 76 feasibility studies of irrigation subprojects, it had finished the construction of 5, and it was supervising the construction of other 3. In terms of success, this means that it reached a 3.1% of the goal of irrigation systems that were anticipated to be constructed at that date, and a 3.4% of the surface area that should have been irrigated.

The obvious differences between what was scheduled and

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what was achieved until the moment seem to be due to the following:

- (a) The authorities of the Project, both of the DGRH and of AID, did not interpret correctly the Agreement, which read: "With the signing of the agreement, the DGRH will initiate a number of projects for which the technical designs have been carried out but which have not yet been executed for lack of funds." This meant that there were not initiated the subprojects of micro-irrigation which, in their entirety, could have represented 124 irrigation systems with approximately 372 hectares.
- (b) When BANADESA was excluded from the credit system of the Project, there were automatically excluded 140 potential farmers which could not have been qualified as credit[worthy] subjects by the commercial banks, organized in 32 groups with a total of roughly 100 hectares.
- (c) Being the construction of small and medium-scale irrigation and drainage systems subject to the existence and operation of the credit system of the Project, the construction program was delayed to the extent of the delay of the set-up and implementation of the credit system.

In respect to the work carried out by this element, the following could be noted:

- Of the 76 feasibility studies prepared for a total of 642 hectares, 6 are being reviewed, 4 are pending approval by part of the Technical Committee and 65 have already the stamp of approval. The latter ones are all small and medium-sized farms, such as itemized below:

- From 0 to 5 hectares, 18 farms
- From 5 to 10, hectares, 20 farms
- From 10 to 20 hectares, 19 farms
- From 20 to 40 hectares, 5 farms
- From 40 to 80 hectares, 3 farms

The weighted average of the 65 studies is of 10.8 ha per farm.

- Of the 76 feasibility studies prepared, 20 were eliminated due to not having possibility of qualifying as credit[worthy] subjects by the commercial banks.

- The designs of the irrigation systems were prepared according to the technical standards of general practice, such as those of the Bureau of Reclamation and Soil Conservation Service of the United States and of the Ministry of Agriculture and Hydraulic Resources of Mexico, which is considered satisfactory.
- The feasibility studies of the subprojects were prepared observing the "logical sequence," which was developed by the Technical Assistance [group] to these effects. The logical sequence contains the actions and defines the responsibilities to prepare the sub-projects. It is a useful system for the technicians of the regional offices. It allows an orderly integration of the various disciplines and an adequate follow-up and control of the progress.
- The designs of the irrigation systems of the first prepared subprojects showed methodological errors. The deficiencies have been corrected and are currently of good quality. It can be noted, however, that the designs are still prepared giving more emphasis to the aspects of civil engineering than to those of agronomy, which is natural due to the importance the civil engineers have compared with the agricultural engineers that participate in the design of the irrigation systems of the subprojects. This disequilibrium could cause problems of agricultural productivity and of profitability in the subprojects if the project management does not correct this weakness, strengthening the regional staffs and the part played by its agricultural engineers in the design of the irrigation systems and the cultivation planning.
- The engineering designs of the irrigation systems, seen from the point of view of civil engineering, are adequate, although the tasks to prepare the land seem to be too elaborate for agricultural projects of the magnitude of those prepared by the Project. The same agricultural results could be achieved with less refining of the currently carried out topographic leveling work.
- The analyses of profitability of the studies prepared by the economists of the Credit Component contain for each subproject the cultivation program, the budget for the crops, the yields and productions, the investments, the operating costs, the cash flow, the projected income and expenditures, and calculation of the internal rate of financial return, and the net actualized value. The analyses are adequate from a methodological point of view but they are inadequate as

regards the criteria of profitability and approaches used by the commercial banks to rate the subprojects and to furnish financing.

The profitability analyses are prepared with "theoretical precision" but they lack interpretation of the results. The technological packages of the crops are correctly formulated, save for the excessive use of some high cost expenditures for certain crops, such as corn and rice. Regarding the prices that are used in the analyses there exist doubts about the representability of the sales prices of the crops at the farm level. Finally, the profitability rates of the subprojects are too high, which seems to be due to the use of optimistic yields, to the summarized analysis of the "without project" situation and to the adoption of very short maturing periods of the yields in the production projections. Regarding the "without project" situation, the study of the economic data should be more complete and exact to obtain a better and just idea of the production, prices, yields, production costs, etc. of the beneficiary producers. This would allow to draw a more adequate comparison with the "with project" situation in order to obtain the actual increases caused by the irrigation.

- The preparation of the designs and the construction of the irrigation systems are carried out without coordination with the DGRH technicians. This has as result that the professional staff of the Project loses the possibility to benefit from the experience of the DGRH professionals in irrigation matters and viceversa. In the future, the project management should require more interaction between the Project professionals and those of the DGRH in the aspects of design and construction of irrigation systems, with the object to obtain a uniformity of techniques, methodologies and procedures between the parties.

In the execution of the 1989 Action Plan of this component, the Project achieved the below results until May 31, 1989:

- Thirty irrigation systems on 482 hectares were designed, carrying out 91% of the program for the period.
- The construction of 5 irrigation systems (Delmer Montoya, Fausto Bográn and Misselen in San Pedro Sula; and La Culebra and el Tamboral in Comayagua) were supervised, covering 107 irrigated hectares, carrying out 71% of the program for the period.

- The signing of 4 construction contracts for irrigation systems was supervised.

Promotion, Extension and Training

The Agreement called this element "Water Management on the Farm." It had the object to provide technical assistance to the agricultural producers so that they adopt new cultivation methods and other technologies, in order to benefit from the irrigation infrastructure that was going to be implemented. The aims of this element were not correctly or clearly defined in the original design of the Project.

In practice, the component operated without internal cohesion during the period from August 86 to December 88 and without major coordination with the other components of the Project. Its disciplines: water management, crop production with irrigation, promotion, extension and training functioned independently of each other. In November 1988, the component changed the name to "Promotion, Extension and Training" (PEC) and integrated the other mentioned areas in order to operate more in conformity with the provisions of the Loan and Grant Agreement.

The achievements of the component during the period from August 1986 to December 1988, are stated below

(a) Promotion

The slogan, logo, posters, pamphlets, calendars, videos, decals, and a radio announcement were produced in order to publicize the Project. The radio announcement was not used so as not to create excessively premature hopes among the farmers.

The beneficiaries were identified through direct contacts with the farmers. This type of promotion resulted more difficult in Choluteca due to the lack of water sources and of bank branches.

The promotion of the Project was successful; it made the Project known both in cities as well as in the rural areas and it facilitated the identification of the beneficiaries. The methodology used for the promotion was effective.

(b) Extension

The strategy of transfer of technology was drawn up, including a diagnosis and a transfer program. The

strategy was adopted by the Extension Service of the Ministry of Natural Resources through official resolution by the Assistant Secretary.

In three seminars, one in each region of the Project, 15 technicians were trained in the transfer strategy.

Extension services were furnished in a permanent manner to the subprojects of Rondón del Carmen and La Guadalupe.

The extension furnished by the Project was of reduced magnitude due to that not many subprojects are constructed. Its quality was deemed satisfactory, notwithstanding the difficulties encountered in a subproject of 15 associated farmers, such as Rondón del Carmen.

(c) Training

In 2 seminars and 2 short courses 32 farmers were trained in the general aspects of agriculture with irrigation. It is recommended that in the future the training of the farmers be more specific during the cultivation of each product.

In 9 seminars and 8 courses 350 technicians were trained in the use and management of water for irrigation, hydrometry, irrigation systems planning and extension. The high number of qualified technicians contrasts with that of the qualified farmers, which was only of 10%. It seems that the reason is, that it is easier to organize courses for technicians than to convince the farmers to attend the courses.

Seven technicians were trained in the United States and Israel in the design of irrigation systems, cooperative industrialization, irrigation by sprinklers, organization and institutions of agricultural education.

Most of the training in the country was conducted in the "Center of Agricultural Development Education" (CEDA) of the DGRH. It is deemed that the training was satisfactory as regards the topics offered but that it did not necessarily address the technical needs and the opportunities of the Program. It is recommended that in the future the Project program in advance the courses it wishes for the technicians to take in the CEDA, and that it program jointly with the instructors of the CEDA the curriculum of the courses and the opportunity for their implementation.

(d) Crop production with irrigation

Twenty guidelines for crops were prepared and discussed with the regional agronomists. They contain standards for crop management and cultural reports. The guidelines are in an advanced draft form.

The cultivation programs and irrigation designs of 34 subprojects prepared by the regional offices were reviewed.

A demonstrative tract of land of corn was installed in Rincón del Carmen which was not taken care of, with loss of the data. This happened due to negligence and misunderstandings of the responsibilities, by part of the experts of the main office as well as of regional office.

The extension personnel was assisted in the implementation of 8 courses of agricultural production with irrigation.

Three courses on irrigation were conducted in the CEDA and in Guaymas.

The tasks carried out in the area of crop production with irrigation are within the framework of the Agreement but they have some deficiencies that have to be remedied. Thus, for example:

- The guidelines for crops are technically correct but they lack more experimental information and field validity.
- The yields used for the preparation of the cultivation programs of the subprojects are optimistic and costly in view of the possibilities of the farmers.
- The corrections made to the crop programs of the subprojects, prepared by the regional offices, are not discussed with these as indicated by the professionals of the regional offices, causing uneasiness, stand-stills and potentially erroneous forecasts. The technical consultants in this matter at the main level assert that both the basics for the preparation of the crop programs of the subprojects as well as the corrections to the cultivation plans, prepared by the regional experts, are fully discussed with the responsible parties of the regional offices but that they don't listen to them. In any event, in this aspect it is necessary that the Project management establish a better coordination between the experts of

the main level with the ones responsible at a regional level.

(e) Water management at the farms

Twelve of the 18 guidelines of demonstration of water management practices were prepared. They are still in a draft form and have not yet been distributed.

Four water management programs were prepared for the constructed subprojects.

The design of the irrigation systems of 34 subprojects constructed in 1988 was reviewed as well as 5 to 6 of the 33 that were prepared until the end of May 1989.

Technical assistance was given to the subprojects 15 de Septiembre, Rondón del Carmen y La Guadalupe.

Acting as counterpart in the preparation of the design and construction standards.

Three seminars for 23 technicians were conducted in the following topics: discussion; operability and evaluation of the technological package of water management.

A diagnosis was made of the water management for tracts of lands.

The tasks carried out in this area show the following:

- The demonstration guidelines are well focussed for the extension worker and the farmer. They have a direct message and the drawings and illustrations are illustrative.
- The technological packages of the water management programs established for the constructed subprojects are adequate for the extension worker but their structure of presentation should be improved in order to facilitate its use in the regional offices.
- The reviewing process of the irrigation system design is carried out without consulting the responsible parties of the regional offices nor with those in charge of the design at the main level, which has caused unnecessary antagonisms. Although this deficiency is in the process of being remedied, it is still necessary that the Project management establish ways to totally remedy it and give the pertinent instructions to those who are in charge.

- The changes that were recommended and implemented by the technical assistance at the main level to remedy the operational problems of the systems constructed in Rincón del Carmen were not technically completely accurate.

The execution of the 1989 Action Plan of this component until May 1989, achieved the following progress:

- Promotion of the Project, 85%: promotion of farmers, 100%; technical assistance to producers, 80%; training of producers, 45%.
- The lowest success rate was in the training of the producers since the Project did not have bulletins of notification and did not conduct any courses in farm management, marketing and crop production with irrigation.
- As regards the promotion of the Project, the projected seminar for bankers did not take place; and in respect to the technical assistance to the producers there were not held any field demonstrations. The seminar for bankers was postponed indefinitely until a better occasion.

Credit

In accordance with the provisions of the Loan and Grant Agreement, the Project contemplated the granting of the below credit amounts during the 1986/89 period:

Beneficiaries	Projection of subprojects to be constructed	Average extension (ha)	Average cost (US\$/ha)	Projection of credit to be granted
Micro	124	372	500 - 1,000	280
Small	23	345	1,000 - 3,000	690
Medium	8	480	1,500 - 2,000	1,320
Drainage	4	240	500 - 1,500	240
TOTAL	159	1,437		2,530

In practice it was found that until May 31, 1989, the Project had granted 4 credits for a total amount of US\$209,177, representing the 8.3% of the total projected for the 1986-89 period. Of this amount, US\$80,595 were for investment credit and US\$128,582 for equipment credit.

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The considerable deficit noted between the projected credit and the actually granted credit, calculated at US\$2.3 million for the period, seems to be due to the following factors:

- (a) The set-up of the credit system for the Project took too long, delaying to a great extent its implementation.
- (b) The exclusion of BANADESA as a potential intermediary institution of credit of the Project automatically eliminated the potential financing of irrigation micro-projects, which could have been financed through this institution.
- (c) The original design of the Project was very optimistic in its projections of the loans to be granted, mainly during the first two years.

Each of these factors is hereafter analyzed:

- (a) The set-up of the irrigation credit system of the Project was delayed since the signing of the Loan and Grant Agreement on August 29, 1986, until July 1988 (23 months), on which date AID considered fulfilled the Condition Precedent 5.2 (c) regarding the "creation" of the credit system of the Project. Originally, pursuant to the provisions of the Agreement it was anticipated that it would be set-up and operating in January 1987, but it was delayed waiting that the DGRH, AID, the Banco Central, the commercial banks, and the Treasury Department finish their talks and agree on the provisions of the Tripartite Management Agreement and the Credit Regulations of the Project. The talks were extended over many months, due to the frequent disagreements that arose between the representatives of the Government of Honduras and those of AID about the terms and conditions of the credits, among them, the interest rates, the risk levels of the private banks and of the Project, the guarantees, the participation or exclusion of BANADESA, and other aspects that were necessary to be defined beforehand in order to define the operations of the credit system of the Project.
- (b) The exclusion of BANADESA as an intermediary credit institution of the Project occurred during the drawing up, discussion and negotiation process of the Tripartite Management Agreement and of the Credit Regulations. The opposition of AID to the

participation of BANADESA in the credit system of the Project seems to have been the determining factor for its exclusion.

Section 6.01 of Article VI of the Tripartite Management Agreement automatically eliminated the possibility that BANADESA could qualify as a participant in the credit system of the Project, a fact which also eliminated, automatically, the possibility that Project could finance 124 irrigation micro-systems for a total of US\$280,00 during the period.

- (c) The original design was very optimistic in assuming that the commercial banks were going to react rapidly and in assuming that the small farmers could qualify as credit[worthy] subjects of the commercial banks. In practice, the first was rather slow and the latter continues to be rather difficult. The implementation per se of the credit system did not start until October 1988, at which time the credit specialist joined the Project. As of that moment, it was started to plan the credit operations, the incorporation of the commercial banks was negotiated, the transfers of funds to the Banco Central were processed, the feasibility studies of the subprojects were presented to the consideration of the banks, declarations of eligibility were obtained, the approvals of credits were obtained, and the first disbursements were transacted. Therefore it can be said, that the credit system of the Project did not start to operate until January 1989, when the execution of the 1989 Action Plan, prepared with a more modern administrative methodology, was implemented.

As of May 31, 1989, the credit component of the Project had achieved the following results:

No. of Intermediary Institutions (IIC) incorporated	7
No. of eligibility petitions presented to the IIC	63
No. of eligibility petitions approved by the IIC's	41
No. of credit applications presented to the IIC's	27
No. of credit applications approved by the IIC	4
Amount of credits approved by the IIC's (US\$) ^{1/}	209,177
Amount of credits disbursed by the IIC's (US\$)	84.8
Areas to be irrigated with the approved credits (ha)	92

^{1/} With resolution of loan

From the foregoing it can be gathered that the credit system of the Project, although seriously delayed in its set-up phase, became manifestly active in the implementation phase. This activity is shown not only by the already approved credits but also by the credits that are pending in the banks, some of which were already approved by the Boards of Directors and the Credit Committees, for an approximate amount of US\$2.8 million. (See Annex 7).

Regarding the achieving of the goals projected in the 1989 Action Plan, the credit component of the Project has achieved the following for the period January-May 1989:

PRODUCTS	G O A L		PROGRESS %
	PROGRAMMED	ACHIEVED	
1. Operational agreements with the banks, executed	4	7	175%
2. Credits approved for sub-projects prepared in 1988	10	3	30%
Amounts approved for sub-projects prepared in 1988 US\$ 1/	625,000	171,217	27%
3. Declarations of eligibility, obtained	32	41	128%
4. Credits approved for sub-projects prepared in 1989	2	2	100%
Amounts approved for sub-projects prepared in 1989 US\$ 1/	125,000	37,960	30%
5. New banks, incorporated	4	7	175%
6. Reports of socio-economic results of the subprojects constructed and in operation	---	---	---

1/ Approved means that they have a loan resolution

These results indicate that the operation of the credit system of the Project has taken hold and that it has satisfactorily progressed with the

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incorporation of banks into the system. As regards the approval of credits, it lags approximately 72% in respect to the goals projected for the period but there are credits already approved by the Board of Directors of some banks which, if finally approved, will exceed by far the goal set for the period.

If the credit system continues to improve and achieves to be up to date and to meet its goal of US\$1,250,000 for the year, the credit component of the Project will have achieved 50% of the projections for the 1986/89 period in the original design of the Project.

In order to investigate the feeling of the commercial banks and of the Banco Central regarding the ability and the operability of the credit system of the Project, and to gather the opinions of its executives, visits were paid to 5 of the 7 commercial banks incorporated into the Project, 2 of which are in the process of joining, to the Department of Credit and Securities of the Banco Central and the Superintendency of Banks. The impressions gathered from the talks indicate the following:

- The Tripartite Management Agreement and the Credit Regulations, although they contain some inconsistencies and weaknesses that could be improved, are adequate to manage the credit line of the Project under the current conditions. Only Section 6.01 of Art. VI of qualification of the banks should be modified in order to smoothen its strictness, which would allow that more banks join the credit system of the Project.
- The current interest rate for the beneficiary, which at present fluctuates between 16 to 17%, is high for agricultural activities but currently does not represent an excessive obstacle to grant loans to those customers the commercial banks consider "credit[worthy] subjects". The high cost of the credit to the customer is mitigated by the costs for the feasibility study of the sub-project and the technical assistance furnished by the Project to the farmer, which are absorbed by the Project and not by the farmer.
- The 70-30% risk shared by the participating commercial bank with the Project does not constitute a discouraging element under the present circumstances. The banks can operate

satisfactorily with this margin, although some of the executives of the major commercial banks think that if this ratio would be inverted, the banks would have more possibilities to lend to smaller customers.

- At present, the credit system of the Project is adequate and on the right way. The delay in having put it into operation is considered "normal" in the medium because making known a line of credit in the commercial banks of Honduras and to succeed in its acceptance require a gradual process.
- The legal process to incorporate banks into the credit system of the Project is complicated and cumbersome. It has to be simplified.
- The commercial banks require solid mortgages or collaterals. They deem that they could not carry out operations with customers who don't have useful ownership of their lands. Even in these cases they have serious reservations and prefer mortgages backed by urban properties. Only the Banco del Café considered the feasibility to accept crops as collateral.
- The Project should help their customers to obtain the documentation required by the commercial banks to effect loans, such as deeds of properties and others, so as to avoid undue delays in the approval of the loans.
- The banks deem the studies prepared by PRORIEGO as "Letters of Guaranty," which allows them to grant the loans. While PRORIEGO has the capability to prepare the feasibility studies and furnish technical assistance to the customers and can operate efficiently, the banks prefer this alternative to any other one.
- Under the current conditions, the commercial banks would not like to process operations in which the PRORIEGO experts have not taken part in the preparation of the feasibility studies of the subprojects or in the review of same. They consider that the participation of the professionals of the private sector in the design of the feasibility studies of the subprojects could be possible in the future, on condition that it is carried out under a strict methodological supervision of the PRORIEGO experts and that the

studies be backed by the Project.

- The commercial banks deem that the performance of the credit specialist of the Project was excellent and they praise the speed in which he implemented the credit system as of November 1988.
- Under the current conditions, with the existing legal instruments and systems, the visited commercial banks deem that they could place roughly US\$ 5 to 7 million annually in irrigation subprojects similar to those the Project is running at present.

Institutional Strengthening

Pursuant to the provisions stipulated in the Loan and Grant Agreement, by means of this element the Project contemplated (a) to strengthen the capability of the institutions of the public and private sectors to execute irrigation projects, (b) to improve the capability of the DGRH to develop the legal and institutional framework to execute effective irrigation programs, (c) to improve the capability of the DGRH to plan, execute and administer irrigation projects and to contract and supervise the construction companies of irrigation systems, (d) to assist the DGRH in the drafting of the Water Act and its regulations, and (e) to assist the DGRH in the administration of the Water Act and the National Irrigation Plan.

In practice, this component did not function as such until the end of 1988. Between August 1986 and December 1988, the Project developed isolated actions which dealt with the training of personnel and the drafting of the Water Act and the National Irrigation Plan. Specifically, during this period the following was done: (a) 39 DGRH professionals were trained in water management, standards and guidelines for the construction of irrigation systems, design standards, etc., (b) a consultant in water legislation was contracted to assist the DGRH in the drafting of the Water Act to be presented to the Congress, and (c) the progress status of the drafting of the National Irrigation Plan was reviewed, wherein were found discrepancies between what AID expected and what the DGRH had accomplished.

Concomitantly, 140 farmers of the various regions were visited in order to gather economic, social and legal information; 3 regional seminars in socio-legal matters were conducted in order to select irrigation subscribers; regulations of grants and training were drawn up as well

as a draft of agreement between PRORIEGO and INA.

Starting in January 1989, the Institutional Strengthening component started to function as an element; its Action Plan contemplated the completion of 14 products during the year. Product No. 14 included a monetary assistance to the DGRH to finance personnel. In 1989, the assistance amounted to US\$100,000; and the total since 1987 amounts to US\$266,600, which were mainly used to cover personnel expenses of the DGRH.

Until May 31, 5 of the products scheduled until this date (1,2,5,6,8) were completed on time, 2 were delayed (4,11), 3 had come to standstill (10,12,13), nothing was done with 2 (7,9), and the execution of 1 was not going to be started until July (3). The most important achievements of the period are commented below:

- The Water Act was evaluated by a foreign consultant. The consultant recommended that the SRN [Ministry of Natural Resources] apply for the temporary approval of various legislative decrees until the Water Act be promulgated by Congress. Among them is a draft of legislative decree that would allow the SRN to grant temporary "authorizations" of water use to the farmers that would ask for them.
- The progress in the drafting of the National Irrigation Plan was analyzed by a local consultant. The consultant recommended to continue with the drafting, reconsidering its scopes, objectives and contents.
- The construction and design norms and standards were prepared by a foreign consultant. The first are grouped in 14 topics, of which 7 have to be translated, 3 have to be corrected and all of them have to be edited. The second ones are grouped in 10 topics, of which 6 have to be worked out, 8 have to be translated and all of them have to be edited. These norms are of high technical value and will be of great benefit to standardize the design of irrigation systems by various institutions.

Among the most important nonfulfillments are the following:

- The water permits programmed for the subprojects were not processed.
- The strategy for the qualifying of the construction companies was not set forth.

- Only 4 of a total of 8 candidates scheduled for postgraduate studies in the U.S. were selected.

Looking at the achievements of the Institutional Strengthening component until this moment, the conclusion can be reached that the component was not driven by the force required by the Project, especially as regards the institutional strengthening of the DGRH. It is necessary that the Project management play a more active part to orient and speed-up the execution of this component, defining better the results to be achieved every year in order to strengthen the DGRH and the entities of the private sector that take part in the irrigation.

3.4 COST

The total estimated cost of the Project for the 1986-93 period was as follows:

Component	Loan	Grant	GOH (US\$ 000)	Total	%
Design & Construction	100	5,140	500	5,740	17.4
Prom., Ext., Training	630	2,460	2,600	5,690	17.2
Credit	11,470	—	5,000	16,470	49.9
Inst. Strengthening	1,600	250	2,080	3,930	11.9
Evaluation	—	150	—	150	0.0
Contingencies	700	—	300	1,000	3.0
TOTAL	14,500	8,000	10,480	32,980	100.0

In practice, until April 30, 1989, the following was carried out:

Budget	Loan	Grant	GOH (US\$ 000)	Total	%
Planned	14,500	8,000	10,480	32,980	100.0
Paid	264	2,477	604	3,345	10.2
Committed	524	2,411	1,331	4,266	12.9
Available	3,145	13,612	8,612	15,369	76.9

As it can be seen, the paid budget amounted to 10.2% and the committed is of 12.9% of the planned budget. The available balance is of US\$25.4 million, which equals 76.9% of the planned budget. The loan and grant budget shown in the above table includes the modifications of

financing made by AID through modifications 2 and 3 to the Loan and Grant Agreement, changing some items from loans to grants.

The paid budget of the Project was financed through payments made by the Government of Honduras and AID.

The government payments were made with funds of the Projects of Stabilization and Economic Recovery of AID. The AID payments were made through a revolving fund of US\$250,000. The difference between the payments from the loan and grant funds and the financing with the revolving fund was directly paid by AID.

In the below table can be seen the chronology of the payments, both from the counterpart resources and those from AID.

No.	Date of availability	Counterpart (US\$)	AID
1	July 1, 1987	200,000	
2	December 23, 1987		250,000 1/
4	March 15, 1988	400,000	
5	April 11, 1988		500,000 2/
6	November 11, 1988	750,000 2/	
7	January 1989	450,000	
8	May 1989	320,612	
TOTAL		2,120,612	750,000

Per component, the paid budget was as follows:

Component	Loan	Grant	GOH (US\$ 000)	Total	%
Design & Constr.	132	1,087	246	1,465	43.8
Prom., Ext., Tr.	118	759	165	1,042	31.1
Credit	53	477	99	629	18.8
Inst. Strength.	28	154	27	209	6.3
TOTAL	331	2,477	537	3,345	100.0

The analysis of the paid budget indicates the following:

- The proportion of the expenditures incurred until April 1989 per component is substantially different than anticipated in the Agreement.

- A 16% of the paid budget was covered by the Government of Honduras. The remaining 84% was covered by AID.
- The paid budget for the execution of the component "Design and Construction of Irrigation Systems" was of US\$1,465,000 or 43.8% of the total spent by the Project in the period. If it is assumed that the expenditure of this component was directly related with the production of the feasibility studies of the sub-projects, it can be deduced that the cost for the production of each of the 76 studies was of US\$19,300 or US\$2,300 per designed hectare. These figures could be 15% lower if from the paid budget were excluded the expenditures incurred for durable goods, such as vehicles and equipment. Using the same bases of calculation during the execution of the 1989 Action Plan until May, the production cost of the studies dropped to US\$2,682 for each study or US\$167 per designed hectare.

The total executed budget (paid, committed and available) itemized by expenditure and by source of funds is presented in the following table.

ORIGINAL BUDGET OF THE PROJECT AND EXPENSES INCURRED, COMMITTED AND AVAILABLE BALANCE

FUNDS	Original budget	Modified budget	Modified budget	Government		A J D		Technical Assistance		Totals	
				By modif. # 1. & 2	By mod. # 3	Paid	Committed	Paid	Committed	Paid	Committed
Loan Fund											
Materials & Supplies	475	170	105	37			24		37	34	44
Funds Infrastruct.Credit Training	11,470	10,000	2,835		500					500	2,335
Motorcycles	105	100	100			32			32		68
Fuel and lubricants	200	90									
Salaries governm. personnel	200										
Travel expenses	100	470	470	16					16		454
Irrigation equipment	500	250									
Vehicles	150	440	440			232			232		208
Contingencies	700	800									
Technical Training		250									
Producers Intern. Training		300									
Foreign long-term training		550									
Foreign short-term training		200									
Promotion Campaign		100	50	14					14		38
Technical Equip. & Office		630									
Family Assistance		150									
	14,500	14,500	4,000	67	500	284	24		331	524	3,145
Counterpart Fund											
Training	1,100										
Operational Costs	250										
Funds for Credits	5,000	5,000	5,000		750					750	4,250
Salaries personnel	2,700	4,490	4,490	448	581				448	581	3,461
Vehicles	500	500	500								500
Travel Expenses	200	52	181	41					41		120
Fuel and lubricants	230	56	27	6					6		21
Materials	200	132	52	42					42		10
Contingencies	300										
Promotion Campaign		50	50								50
Office Equipment		200	200								200
	10,480	10,480	10,480	537	1,331				537	1,331	8,612
Grant Fund											
Foreign Technical Assist.	1,900	1,800	1,800				1,283	453	1,283	453	64
Domestic Technical Assist.	2,400	4,500	4,500				816	1,323	816	1,723	2,361
Travel Expenses	400										
Materials, Insur., services	330	665	950	89					89		861
Vehicles	270	60	60			54			54		6
Operational costs	400										
Salaries personnel	1,600										
Fuel and lubricants	300	490	490	45		15			60		430
Short-term Assistance	250	300	300			13	37		13	37	250
Evaluation & Audits	150	160	160								160
Foreign short-term training		25	225			29	12		29	12	184
Salaries governm. personnel			200								200
Internal Technical Training			250								250
Internal Training Producers			300								300
Foreign long-term Training			550								550
Promotion Campaign			50	8					8		42
Funds for Infrastructure			7,165								7,165
Equipment			900			125	586		125	586	189
Contingencies			600								600
	8,000	8,000	10,500	142		235	635	2,095	1,776	2,477	2,411
Total	32,980	32,980	32,980	746	1,831	500	659	2,099	1,776	3,345	4,266
											25,369

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An analysis of these figures allows the following deduction:

- If the authorities of the Project don't adopt the Alternative IV which is recommended in this report and if they continue to operate as up to now, the contribution by part of the Government of Honduras would result insufficient to pay for the expenditures of wages and salaries until 1993. Considering an approximate historic cost of yearly US\$800,000 for these items, the Project would need additional US\$700,00 to cover the obligations of the Government of Honduras until 1993. See calculations in Annex 8.
- The funds for foreign technical assistance are almost exhausted. If a new foreign assistance team is contracted, the Project would need an additional amount of US\$1.86 million, which would have to be furnished by means of a reprogramming of the budget or through an additional contribution by part of AID.

4. PERFORMANCE OF THE EXECUTORY INSTITUTIONS

4.1 DGRH

The DGRH managed the execution of the Project from August 1986 until June 1988. The direction and management of the Project was in the hands of the Assistant Director of Hydraulic Resources and of the Director of the Department of Irrigation and Drainage. The first performed additionally his regular line functions and the latter those of National Project Director. The National Project Director acted also as counterpart of the technical assistance group from the moment of arrival of the consultants in August 1987.

The analyzed information, both from the written documentation of the Project as from the one gathered through interviews, shows that the DGRH neither directed nor managed properly the execution of the project during this period. It allowed to work without organization, without planning and with appropriate controls. This originated conflicts, confusion and power struggle between the participants, both of the government and of the technical assistance [group], which finally brought the Project to a standstill situation in June 1988.

During the administration of the Project by the DGRH it was noted that confusion existed regarding the objectives of the Project; conflicts of leadership, direction and responsibilities; delays in obtaining counterpart funds and in the contracting of counterpart personnel; an incorrect and incomplete interpretation of the terms of the Agreement; lack of administrative, financial technical and logistic

support; and a considerable delay in the creation of an autonomous unit of the Project.

Judging from the accumulated evidence, the performance of the DGRH in the direction and management of the execution of the Project during the period from August 1986 to June 1988 was inadequate.

As of June 1988, when the Project became independent, until the present, the DGRH has kept away from the decisions and the management of the Project, occupying itself with its own specific tasks which, in respect to the design and construction of irrigation systems and the managing of the credit line of US\$1.0 million for micro-irrigation projects, seem to have been successful as it can be seen from Annexes 9 and 10. The information contained in Annex 9 was taken from the 1988 Report of the DGRH; the data on the magnitude of the performed work seem to be exaggerated, especially in regard to the studied, rehabilitated, constructed and visited irrigation areas. The evaluation team did not have the time to verify the accuracy of this information.

4.2 USAID/HONDURAS

USAID/HONDURAS participated in the Project ever since its conception in May 1985. It financed the consulting services and supervised the drafting of the Project Identification Document (PID) and of the Project Document (PP); it reviewed, adjusted and negotiated the Project with the national authorities and signed the Loan and Grant Agreement. As of the signing of the Agreement on August 29, 1986, USAID/HONDURAS, through its Office of Agriculture and Rural Development and the support of its administrative offices, participated in the execution of the Project, playing the part of financial backer, supplier and supervisor. In some cases, such as in the contracting of the technical assistance, the acquisition of vehicles and other equipment and the sending of recipients of scholarships to universities in the U.S.A. it acted as executive director.

Its participation in the execution was primarily through its Project Offices and its liaison officials which numbered six, 4 in the first case and 2 in the second one, over a period of three years.

According to what was noted, heard and analyzed in the information gathering process, the performance of USAID/HONDURAS was varying, depending on the work methods of the Project Officer who was in charge. Generally, this performance until June 1988 was characterized as not constructive for the participants in the Project; it did not help to clarify the wording nor the spirit of the Agreement; it

frequently changed its position; very rigid in some aspects and slow in respect to the contracting of the technical assistance and the acquisition of vehicles and other equipment. As regards the technical assistance, it took 9 months to contract the consulting firms and regarding vehicles and equipment, it took from 12 to 20 months between the acquisition and delivery to the Project. (Annex 11).

As of June 1988, the performance of USAID/HONDURAS was based on a mixture of pressure and support actions and of clarification of problems for the participants. As a result thereof, there could be noted a substantial improvement of the morale of the personnel of the Project, in comparison with other eras, a better direction and internal management of the Project, better relations with AID, and a high degree of commitment by the personnel for the task of achieving the objectives and goals of the 1989 Action Plan. It was found, however, that AID/Honduras had been exercising strong pressure to mobilize the credit, a pressure which is causing a certain confusion and fear in the professional personnel of the Project, due to being accompanied by threats to discontinue the Project or to transfer the credit line to other AID projects.

4.3 BANCO CENTRAL AND INTERMEDIARY CREDIT INSTITUTIONS

During the implementation of the Project, the Banco Central de Honduras participated in the drafting, reviewing, approval and signature of the Tripartite Management Agreement and of the Credit Regulations. During the operation per se of the irrigation credit system, the Banco Central has been acting as administrator of the funds which the Department of the Treasury and Public Credit had placed at its disposal to take care of the applications for investment and equipment credit of the Project. The sum placed at the disposal of the BCH was of US\$10.0 million from the AID loan and US\$5.0 million as counterpart [funds]. No explanation was found as to why this amount was lower than the one contemplated in the Agreement, which was of US\$16.5 million.

INTERMEDIARY CREDIT INSTITUTIONS (IIC)

Until May 31, the following Intermediary Credit Institutions joined the credit system of the Project:

IIC	Date of Incorporation
FIA 1/	November 23, 1988
FICENSA	November 23, 1988
CONTINENTAL	November 30, 1988
SOGERIN	December 02, 1988
BANCO DE LOS TRABAJADORES	January 03, 1989
BANHCAFE 2/	February 20, 1989
BANCO DE COMERCIO 2/	May 09, 1989

A summarized description of each of these institutions is presented in Annex 12.

5. PERFORMANCE OF THE TECHNICAL ASSISTANCE

To provide technical assistance to the DGRH in the execution of the Project, AID, in accordance with the Agreement, contracted directly WINROCK INTERNATIONAL INSTITUTE FOR AGRICULTURAL DEVELOPMENT of the U.S.A., which competed in partnership with HARZA ENGINEERING CO., COLORADO INSTITUTE FOR IRRIGATION MANAGEMENT and AGROTECNIA S.R.L DE C.V. of Honduras. The contract between AID and WINROCK was signed in May 1987, and the subcontract between WINROCK and AGROTECNIA in August 1987, both contracts having a duration until June 1990.

According to the contract, the technical assistance had to provide consulting services to all the components of the Project, and had to function as direct executor in some of them, such as in the drafting of the feasibility studies, in the preparation of proposals for subprojects and in the assistance in water management on the farms.

To perform the contract, the technical assistance was organized as follows:

Central Office

Foreign Consulting

- 1 irrigation engineer, team leader
- 1 specialist in agricultural production
- 1 specialist in water management on farms
- 1 specialist in agricultural extension

National Consulting

1 agricultural engineer
1 specialist in sociology
1 agricultural economist
1 administrator

Regional Offices

National Consulting

1 design engineer, coordinator
1 senior agronomist
2 assistant agronomists
1 topographer
1 draftsman

The performance of the foreign and domestic technical assistance is hereafter analyzed in conformity with the responsibilities delegated upon them in the Technical Assistance Contract, within the same context and order in which they were set forth in the Contract.

General responsibilities

(a) To assist in the drafting of the Water Act

In November 1987 and April 1989, the technical assistance furnished short-term 2 consultants to assist in this aspect. The first conducted a final review of the draft of the Water Act, which the DGRH had prepared to be presented to the Congress of Honduras, he evaluated its articles to analyze their incidence on the activities of the Project, and he recommended the actions to take for its prompt ratification. The second one reviewed the current law and the projects of law that had been submitted to Congress and he recommended modifications that could be made through legislative decrees. This would have as object to facilitate the farmers the possibility of obtaining "permits" or "temporary authorizations" of water use, while the new law would be ratified and promulgated. Additionally, the consultant drafted the regulations for the operation and maintenance of the public and private irrigation districts.

In respect to this responsibility, it can be said that the technical assistance performed satisfactorily, although with considerable delays in the second action taken.

(b) To assist in the development of a National Irrigation Plan.

In accordance with the Agreement, the Government of

Honduras had to prepare the National Irrigation Plan within a period of 24 months, reckoned from August 1986, based on the Irrigation and Drainage Master Plan which had been prepared by the DGRH in 1985. In February 1988, the technical assistance conducted a revision of the progress in the drafting of the National Irrigation Plan by part of the DGRH and found that there existed considerable differences of opinion between what AID expected from the document and what the DGRH thought the objectives and scopes of the Plan should be.

In April 1989, the technical assistance contracted a short-term domestic consultant to revise, for a second time, the progress in the drafting of the Plan. The conclusions and recommendations of this consultant were to continue with the drafting of the Plan, clarifying its objectives, scopes and contents.

In respect to this responsibility, the technical assistance did not perform satisfactorily. It did not furnish effective support to the DGRH to direct the drafting of the document and to finish it. Given the delay of progress in this aspect, AID gave it a new deadline until December 1989, to finish the mentioned Plan.

(c) To assist in the revision of the outlines of the construction norms and standards.

The Agreement established that the DGRH would be in charge of revising the norms and standards of the construction of irrigation systems and to refine the guidelines to produce the pre-feasibility studies for the subprojects.

In order to assist the DGRH in these aspects, the technical assistance contracted a short-term foreign consultant to prepare the design and construction norms for irrigation systems. The consultant finished the construction norms and he still has to complete the design norms. The work of the consultant was of good quality. Some of the chapters of the work still have to be translated, edited and published in order to be considered finished. The technical assistance furnished the DGRH with a copy of the construction norms for its comments.

In respect to this responsibility, the technical assistance performed satisfactorily but with considerable delay since, up to this moment, the norms and standards could not be used for the requirements of the Project.

- (d) To assist in the development of a training plan for the Project.

The technical assistance prepared a diagnosis of the requirements of training of the professionals, technicians and farmers; based on it, it prepared a training plan which is being implemented.

In respect to this responsibility, the technical assistance performed satisfactorily, especially with the training of the professionals and technicians. It was more difficult with the farmers because not sufficient subprojects had been executed, and thus the number of qualified farmers was substantially lower than that of the professionals and technicians.

- (e) To counsel in the establishment of a credit system.

The technical assistance participated, through the agricultural economist and the sociologist, in the discussion and the drafting of the legal documents of the credit system, such as the Tripartite Management Agreement and the Credit Regulations. The drafting and approval of the system took 23 months, considerably delaying the implementation and the execution of the entire Project.

In respect to this responsibility, the technical assistance did not perform satisfactorily. It assigned to this aspect of vital importance for the Project people who did not have practical experience with credits nor with operations with commercial banks.

In order to implement the credit system, the technical assistance finally contracted a long-term consultant with wide experience with the commercial banks of Honduras. As of October 1988, the work of the consultant was successful.

- (f) To assist in the development of a national campaign for the promoting of irrigation.

The campaigns conducted by the technical assistance were successful, they achieved to motivate many potential clients which, at a certain point, threatened to exceed the capacity of the field teams to prepare subprojects.

- (g) To ensure that constructive relationships exist between the foreign consulting services, the domestic consulting services and the Honduran construction companies, in order to improve the capabilities of the latter to participate in the planning and execution of future irrigation projects.

The technical assistance held a meeting to present the

Project to the engineering firms interested in participating in the construction activities of irrigation systems.

In respect to this responsibility, beside the qualifying process for the construction companies which was done with the participation of the national counterpart, the efforts of the technical assistance were neither constant nor of importance.

Direct responsibilities

(a) To prepare the feasibility studies.

The technical assistance participated directly in the drafting of the feasibility studies of the subprojects. Its participation was through the professionals and technicians of AGROTECNIA, who worked in close cooperation with the government counterpart personnel in the 3 regions of the Project.

The revision of the studies produced in the regions was in the hands of the foreign consultants who, in some cases, provided guidelines or recommendations for the setting forth of the various aspects contained in the studies. The revision of the studies regarding production, water management and financial profitability gave raise in many instances to annoyances by the domestic counterparts, due to the delays it originated and the untimeliness in which it was done. On the other hand, the revision of the designs of the irrigation systems was not very rigid, due to the work load of administrative nature of the Technical Assistance Team Leader who, in turn, was also the design specialist.

The production of the feasibility studies of the subprojects, with regard to engineering, was done by using widely known criteria and norms, and with regard to agronomy, it was done by using agricultural technologies adapted to the regions. In respect to the analysis of profitability, there were used generally accepted methodologies but the analyses were very much of routine, without any objective in many instances and without critical analysis nor interpretation of the results.

In respect to this responsibility, the technical assistance worked hard and produced 76 studies. Many of them, however, especially the ones produced in 1988, were abandoned due to not being in condition to qualify for financing by the commercial banks. In any event, the technical assistance performed adequately in this aspect, with the mentioned shortcomings.

(b) To prepare the proposals of projects and to submit them to the DGRH for its consideration.

The technical assistance did not comply with submitting

the subprojects to the consideration of the DGRH but it presented them to the Project management, and as of 1989 to the Technical Committee of the Project. The noncompliance was explained by the agreement reached in June 1988 by the DGRH with AID, whereby an independent PRORIEGO was commissioned with the execution of the Project.

- (c) To furnish technical assistance in water management on the farm to the clients of the Project.

The foreign technical assistance provided a long-term specialist to assist the clients of the Project with the water management on their farms. Concomitantly, the domestic technical assistance placed an agronomist in each region for this purpose. The foreign consultant prepared demonstrative guidelines for farmers, which were not distributed until now, he prepared a technological package of water management for the extension workers, which is being used at present, and he participated to a limited extent in the production and the revision of the water management plans for the subprojects, especially in 1989, in which he personally revised 5 or 6 of the 33 studies produced until May, and he visited 6 sub-projects. The national consultants produced the water management plan of each subproject.

In respect to this responsibility, the technical assistance did not perform to the fullest extent, due to the delay in the preparation and distribution of the technical material and because of the inability of the foreign consultant to transfer technology without setbacks which, throughout the implementation of the Project, gave cause to complaints and a series of meetings to resolve the impasses.

In short, the technical assistance, both foreign and domestic, did generally meet the responsibilities assigned to it by the Technical Assistance Contract, although it showed serious shortcomings in its assistance with the direction and organization of the execution of the Project, and in the planning and programming of its activities which, in the long run, were seriously detrimental for a timely execution of the Project.

In the case of the foreign technical assistance, this becomes more evident because it did not show the leadership and knowledge that companies of international renown, such as WINROCK, HARZA and COLORADO, are supposed to have. For example, the timely presence of officials of the executive staff of the main office of WINROCK, at certain moments during the execution of the Project, could have avoided many of the problems that arose and could have oriented the Project to its objectives, thus avoiding the considerable delay suffered until its implementation.

In the case of the domestic technical assistance, the technical deficiencies shown were to be expected in a new field, such as irrigation in Honduras, which does not have "experts" in irrigation matters; it is strange, however, that in the field of rural sociology it was unable to record a concrete and tangible achievement, in spite of having had a well qualified consultant.

6. PERFORMANCE OF THE DIRECTION AND MANAGEMENT OF THE PROJECT.

As explained in point 4.1 of this chapter, the direction and administration of the Project during the period August 86 to June 88, was inadequate. It caused that the Project did not advance and that AID declared it a "problem project."

As of June 1988, the Project became independent of the DGRH and it was reorganized. The authorities formed an Executive Committee, made up by the Assistant Secretary of Natural Resources, the Director of Agriculture of AID, and the Director General of Hydraulic Resources. They appointed as Codirectors, the National Project Director and the Technical Assistance Team Leader. A new organizational structure was established, new responsibilities were assigned, AID replaced its Project Official and its Liaison Officer, and the technical assistance dispensed with the coordinator of the domestic team.

The new organization improved the relations of the personnel, both of the government and that of technical assistance, and directed the work to a more productive route. However, until October 1988, it had not yet achieved to develop and consolidate a plan of execution of the Project adequate to its objectives and requirements. The work was carried out under a strict control and supervision of the new Project Official of AID who, as a result of one of the recommendations by the consultant in administration, established his office on the premises of the Project in order to supervise its activities.

In October 1988, AID contracted an independent consultant to assist the Project in the preparation of an Action Plan for the year 1989. This consultant recommended that the 1989 Action Plan be produced with a managerial outlook, using the methodology of the Projects Management System (SMP). For this purpose, the seminar-workshop was held in Zamora in November 1988 with the participation of all the Project personnel. The Plan was ready at the end of that month. The Plan was produced by component and each of them had a Logical Framework, a Chronogram of Execution with those in charge, and a Budget organized by items according to the classification of object of expenditure. To direct and administer the Action Plan, the consultant recommended a new organizational

structure, which gave clear authority to the government executives, both at a central and regional levels, and which clarified the function of the technical assistance. Moreover, through the creation of the Technical Committee, he gave means to the direction to control the progress of the execution and to interrelate the executives of the four components.

As of January 1989, the Project started to be executed in accordance with the outlines of the 1989 Action Plan, which contains very clear and realistic objectives and goals, set by the executors themselves. In May 1989, the execution had been carried out, to a great extent, in accordance with the established chronogram.

As of January 1989, the execution of the Project excelled due to having a better direction and administration; due to having a better working relationship between the member of the technical assistance, and between them and their counterparts; and due to having raised to a considerable extent the morale of the personnel, which was rather frustrated and discouraged before the reorganization. As a result of this improvement, the Project Officer off AID decreased considerably his daily presence at the Project and he limited himself to support it and supervise it through meetings of the Executive Committee, the Technical Committee and the Liaison Official. Notwithstanding the fact that the administrative and operational improvement was considerable, it is still necessary to substantially improve the Administrative Office, since there had been found many complaints by part of the personnel, especially of the regional one, regarding the delays in the deliveries of their orders and in the processing of the salaries of some employees, who have even worked up to six months without being paid.

At present, the Project is directed and administered with the organizational structure that is presented in Annex 13, which was recommended by the consultant, solely to direct and administer the execution of the 1989 Action Plan. The National Director answers to the Executive Committee and to the Director General of Hydraulic Resources; the Technical Committee presides; it functions as counterpart of the Technical Assistance Team Leader and directs the four components, the Administrative Office and the Regional Offices through the respective directors.

The Project has 165 employees, of which 51 are of technical assistance and 114 are from the government. More than 91% of the latter are contracted. Of the 165 employees, 62 are professionals and technicians and 103 are support personnel. Of the total, 71 (43%) work in the main office in Tegucigalpa and 94 (57%) in the regional offices. The below table shows these aspects:

<u>Personnel</u>	<u>Technical Assistance</u>	<u>Government of Honduras</u>
<u>Central Office</u>		
Professionals & technicians	10	14
Support personnel	11	36
<u>Regional Offices</u>		
- <u>San Pedro Sula</u>		
Professionals & technicians	5	9
Support personnel	5	15
- <u>Comayagua</u>		
Professionals & technicians	5	7
Support personnel	5	15
- <u>Choluteca</u>		
Professionals & technicians	5	8
Support personnel	5	11
TOTAL	51	114

Source: National Project Direction

Observing in the table the make-up of the personnel, it can be seen that the Project has too much personnel in its main office, especially of support.

In respect to equipments, the Project has the following:

<u>Equipment</u>	<u>Technical Assistance</u>	<u>PRORIEGO</u>	<u>DGRH</u>
Vehicles	--	23	4
Computers	3	8	1
Photocopiers	1	1	--
Photocopiers of plans	4	--	--
Typewriters	3	15	2
Theodolite/bubbles	--	16/22	--
Motorcycles	--	10	--
Mimeographs	--	5	--
Retroprojectors	--	5	--
Labellers	--	1	--
Cameras	--	4	--
Video cameras	--	1	--

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For the time being, it seems that the Project is sufficiently well equipped with all necessary items. Only the regional offices stated that they do not have some field equipment, which is absolutely necessary, such as compasses, altimeters, etc. and other small equipment.

7. PERFORMANCE OF THE NATIONAL KEY PERSONNEL OF THE PROJECT

The national personnel of the Project is made up of 114 people, 50 of which are in the main office and 64 are distributed among the 3 regions: San Pedro Sula, Comayagua and Choluteca. The professional and technical staff, of 38 people, is made up of the National Director, the Directors of the Components, the Directors of the Regional Offices, the Administrative Director, civil engineers, agricultural engineers, agronomists, economists, topographers, and social workers.

Hereafter is analyzed the performance of the key personnel, both of the main office as well as of the regional offices:

Main Office

National Project Director

The National Project Director has occupied this position in a permanent manner since June 1988. He simultaneously holds the position of Assistant General Director of Hydraulic Resources. His performance was satisfactory up to now; he was able to raise the morale and the enthusiasm of the personnel; he has been giving precise directions and has maintained control over the attaining of the goals of the 1989 Action Plan; he has improved the relationship of the counterpart personnel with that of the consulting services; and he has established an adequate working relationship with the AID Project Officers. However, he still has to establish a closer working relationship with the Credit Component and strongly trigger the Institutional Strengthening Component. Also, he has to achieve more efficiency in the Administrative Office.

Director of the Design and Construction Component

The Director of this component has been occupying the position since June 1988. Previously, he directed the Project in the capacity of its National Director. He works as counterpart in close collaboration with the national adviser in design engineering. He coordinates and supervises the technical work of the regional offices and keeps an eye on the attaining of the goals of the 1989 Action Plan of the design and engineering component. His work is focussed on engineering aspects and does not cover the agronomical aspects nor water management, which are in the hands of AGROTECNIA.

He worked efficiently on the coordination with the regional offices and there is a good relationship between these and the coordinator. His was rather frequently present in the regional offices, approximately 2 visits per month to each region.

Director of the Promotion, Extension and Training Component

The Director of this component directed the carrying out of the promotion, extension and training activities, assisted by the foreign consultant. This component, in accordance with Agreement, does also include the areas of water management and agricultural production. His performance was closer linked to the first mentioned than to the latter ones. Notwithstanding the fact that the component is meeting its goals programmed in its Action Plan, his work as Director of the Component was characterized by lack of dynamism.

Director of the Credit Component

The new director of this component assumed his position in June of this year. Previously, at the request of the National Project Director, the Credit Consultant was in charge, occupying the position since January 1989. His performance was very satisfactory.

Director of the Institutional Strengthening Component

The director of this component assumed his position in May 1989. Previously, at the request of the National Project Director, the Consultant in Rural Sociology was in charge since January 1989, without obtaining concrete results during his time in the position.

Director of the Administrative Office

The director of the administrative office assumed his position in April 1989. Until this moment, he was unable to improve the efficiency of his office. The number of support personnel is high and complaints were heard from the regional offices on account of very slow procedures, shortage of materials, a very limited petty cash, and others. Previously, at the request of the National Project Director, the National Administrative Adviser, who performed satisfactorily, was in charge of the administrative office.

Regional Offices

Director of the Regional Office of an Pedro Sula

The director of this office was recently replaced. His work was acceptable and his office had satisfactorily carried out

the 1989 Action Plan until April. It could be noted, however, that his management was lacking leadership.

Director of the Regional Office of Comayagua

The Director of this office performed a very good job. He has achieved a very solid integration of his personnel and together they make up a rather efficient technical staff. He has satisfactorily met the objectives and goals of the 1989 Action Plan that were programmed until May 1989.

Director of the Regional Office of Choluteca

The Director of this office has met the goals of the 1989 Action Plan but his management has shown weak leadership. As a result thereof, the regional office was less effective than the two others. It is important to note that this regional office is located in a very difficult area of the country.

In addition to the mentioned personnel, there were other government professionals who worked in the Main Office, such as the Construction Supervisor and the Production Specialist, who performed satisfactorily.

V. CONCLUSIONS AND RECOMMENDATIONS

A. REGARDING THE PROGRESS MADE UNTIL MAY 1989

1. The Project did not reach its objectives and goals contemplated in the original design for the period 1986-89. The number of beneficiary farmers with increased income was 31 instead of 794; the production with irrigation was of 268 MT instead of 15,3400 MT; the overall productivity, although it came close, was a 25% lower; five irrigation systems were constructed on 49 hectares instead of 159 on 1,437 hectares; the approved credit was in the amount of US\$209,177 instead of US\$2.5 million; and US\$7.6 million were spent or committed. The causes for these results were various, but the most important one seems to have been the long delay the Project had for its implementation which, in turn, seems to have been due to the deficient direction and administration; the inadequate technical assistance in the organization and planning; and the confused and ineffective supervision by AID which the Project had during the period August 1986 - June 1988. The original design of the Project, due to having been too ambitious, did also contribute to these differences between the projections and the achievements.

Notwithstanding the causes, these results indicate that it is necessary to analyze if it is worth or not to continue with the Project. For this, 4 different alternative were analyzed, presented below and in Annex 14 with their respective developments.

Alternative I. To discontinue the Project.

Alternative II. To continue the Project in its present form, within the structure of the original design.

Alternative III. To continue the Project with modifications to the original design, incorporating the DGRH into the drafting of the feasibility studies and the execution of subprojects of micro-irrigation, maintaining the present technical-operational capacity and replacing the AGROTECNIA personnel at the end of its contract in June 1990 with consulting services of the private sector.

Alternative IV. To continue the Project with modifications to the original design, incorporating the DGRH into the drafting of the feasibility studies and the execution of the subprojects of micro-irrigation, maintaining the present technical-operational capacity of the Project, replacing the AGROTECNIA personnel at the end of its contract in June 1990 with consulting services

of the private sector and considerable speeding-up of the credit approvals.

The results of the analyses show that only Alternative IV is feasible from a technical, operational, economic and financially point of view and that, therefore, it should be adapted. Alternative IV is realistic but it requires a great effort and speeding-up of the credit approval, an element that is the key to the Alternative. It requires a budget of US\$24.5 million for the remaining 4 years and it can be executed without major managerial or technical changes.

The adoption of this Alternative would probably require a modification of Annex I of the Agreement. It would further require (a) to integrate the DGRH into the Project to work with the agricultural producers of limited recourses; (b) to adequate the direction sand administration to the new situation to deal with consultants of the private sector at the end of the AGROTECNIA contract; (c) to strengthen the regional offices; (d) to place the credit system into the hands of specialist with high "promotional" capabilities; (e) to restructure the current technical assistance, both foreign and domestic; and (f) to redefine the part of the AID Project Officials with the purpose that they become true guides, suppliers and supervisors of the Project.

Under Alternative IV, the Project would again be on the road to assist farmers who own lands of less than 5 hectares, which would be carried out through the DGRH by means of the creation of a system similar to the one the Direction is managing with the FAO Project and BANADESA. In this respect, the situation of this system was analyzed and it was found that its results were acceptable. This Analysis is presented in Annex 10.

B. REGARDING THE ADVANTAGE OF CONTINUING THE PROJECT

2. At this time, the Project counts with the physical and logistical infrastructure that it was able to implement with much effort during the analyzed period. Its execution has considerable improved since 1989; it has strengthened the action of its regional offices; it has made work its credit system; it has raised the morale of its personnel; and it has achieved the first concrete results of constructing irrigation systems, of credit approval by the commercial banks, and of generating agricultural production with irrigation.

Based on all of these examples of and improved execution of the Project and on the results of the analysis of

Alternative IV, it is recommended to continue with the execution of the Project, under the structure recommended in Alternative IV.

C. REGARDING THE AID STRATEGY FOR THE AGRICULTURAL SECTOR

3. In accordance with the document of strategy for the Agricultural Sector of Honduras, which is being discussed with AID, the Agricultural Sector has grown at a rate of 1.5% during the period 1980-87, which is much lower than the population growth rate which was of 3.4%. As a result thereof, the document indicates that the average nutritional levels are lower than those of 1970. In order to overcome this situation, the strategy recommends to improve the efficiency of utilization of the basic resources, among them the agricultural terrains. In order to improve the agricultural lands it considers important, among others, that there be carried out irrigation programs. Within the context of this strategy, it is found that the objectives of PRORIEGO, which are of increasing the agricultural productivity and production by means of irrigation, are well oriented.

D. REGARDING CREDIT

4. The implementation of the credit system of the Project was substantially delayed, especially because of the time it took to produce the Tripartite Management Agreement and the Credit Regulations, which was of 23 months. The causes for the delay were due to the inexperience of the negotiators in credit matters, who let time go by in long and unproductive meetings as to analyses, discussion and revision of the legal instruments of the system.

5. Starting in January 1989, the system started to operate and at present, 7 banks have already joined it; 4 credits were approved and the approval of other 14 is being processed. The implementation of the credit system is mainly due to the work of the Credit Consultant, who started his work in October 1988.

6. In order to speed up the granting of credit, the Project decided to direct its credit system to clients who could qualify as "credit[worthy] subjects" by the commercial banks. This excluded from the Project the farmers of scarce resources who were, in accordance with the Agreement, the main beneficiaries of same, and the small and medium-scale farmers, both individuals and associates, who did not have the possibility of being qualified as credit[worthy] subjects by the commercial banks.

7. The credit system of the Project is currently in operation, somewhat slow, but with signs that it is taking hold. According to talks held with bank executives, the instruments of the credit system are adequate and the credit conditions (interest rate, risk margin, terms, securities) therein contained do not present any problem for a smooth operation under the present conditions, with the type of customers dealt with. A change in Section 6.01 of Article VI of the Tripartite Agreement and a change in Section 10.4 of the Operational Agreement of the Credit Component could facilitate that more banks join the system, and speedier, but it is not essential to make these changes.

8. To consolidate the achievements to this date, and to strengthen even more the functioning of the credit system, it is recommended to the Project: (a) to assign the management of the credit component to a credit specialist having great promotional qualities; (b) to pressure more actively the operations with the banks; (c) to train credit officers, two in the main office and one in each of the regional offices; (d) to train economists in the methods of profitability analyses that satisfy the criteria used by the commercial banks to evaluate credit applications of subprojects; and (e) to intensify the identification of potential customers by working through farmers' cooperatives.

E. REGARDING THE TECHNICAL ASSISTANCE FURNISHED

9. As of June 1989, the Project had received a total of 550 man/month of technical assistance through consulting firms and independent consultants, both foreign and domestic. Judging from the results obtained, the few finished individual tasks and the limited technology transferred, it can be concluded that the technical assistance, although it generally fulfilled its terms of reference, did not have the expected effect, nor did it cover all the areas in which the Project required assistance, such as direction and administration, credit, and the preparation of adequately focussed projects.

In order to continue with the Project it is recommended to reshape the technical assistance in the manner indicated in Chapter VI; which is in accordance with the modifications recommended for the original design of the Project under Alternative IV.

F. REGARDING THE WATER ACT

10. The Water Act is under study in the Commission of Natural Resources of the Congress. It is expected that it will be promulgated in October 1989. At this time, there is not possibility to anticipate the manner in which it will be approved. In the meantime, it is recommended that the Project insist with the Ministry of Natural Resources to achieve the approval of the drafts of the legislative decrees of temporary duration, which were recommended by a foreign consultant of the Project. The legislative decrees propose (a) the creation of a so-called "authorization" for the use of water up to 5 years by the farmers who are interested in irrigation, which would be granted by the Ministry of Natural Resources. This would eliminate the obligation of the contract, a formality which requires the approval of the National Congress; and (b) the modification of various articles of the law in force.

G. REGARDING THE NATIONAL IRRIGATION PLAN

11. The drafting of the National Irrigation Plan, with the understanding that it has to be an instrument that establish objectives, quantified goals, location, investments, etc. of the activities of public and private irrigation activities in the country, is premature. In its place it is recommended that the Project assist the DGRH in the drafting of a "Master Plan" which would give institutional, legal, technical and economic "guidelines," and establish the pertinent restrictions to manage the development of the irrigation activities in the country.

H. REGARDING THE DGRH AND THE LIFE OF THE PROJECT AFTER 1993

12. The Project, as a project per se, has a duration that is limited by its objectives, its institutional and legal framework, and its budget. In 1993, it has to be reincorporated into its original entity, the DGRH of the SRN. So that this be carried out with the maximum possible efficiency, and so that not all the trained personnel and acquired technology be lost, the Project has to start to establish a closer working relationship with the DGRH and its regional offices. On one hand, it must improve the current communication lines, allowing that the DGRH representative at least be present at the meetings of the Technical Committee of the Project; on the other hand, it must start, as of the next Action Plan, to program joint actions to be carried out during the year. With such a method, to be repeated year after year, the Project could be gradually reincorporated into

he DGRH until 1993. In order to ensure its financial feasibility as of that moment, the Project should consider to start a fund in the Banco Central of Honduras based on a percentage of the recoveries of the loans which, in the case of the actual line, were deemed to be rather extensive. See calculation in Annex 15. A detailed discussion of this topic is presented in Chapter VII.

I. TO IMPROVE THE EXECUTION AT SHORT-TERM

While the authorities of the Project reach the decision whether or not to adopt Alternative IV, which is recommended in the report to continue the Project, it is necessary that some aspect be adjusted in order to improve the execution at short-term. The following is recommended in this respect:

To improve the Project direction and management:

13. That the National Project Direction revise the number, make-up and performance of the support personnel of the Project in order to reduce it to a number more adequate for the requirements of the Project. Also, that it start a on-the-job training plan for the support personnel the will remain, mainly of that of the main office.

14. That the National Project Direction and the AID Liaison Officer create a special fund within the Project budget so that the National Director, with the authorization of the AID Project Director, may use it to hire short-term personnel when it is necessary and if there are no other timely means to do it.

15. That the National Project Direction strengthen the functioning of the regional offices, furnishing them the following, according to the requirements of each:

- An assistant for the tabulations and calculations.
- A second engineer to supervise the work.
- More petty cash and faster restitution.
- Updated information of the costs for sprinkler and seepage systems.
- Light instruments for field survey tasks and quick studies, such as engineering compasses, compensated altimeters, eclimeters, podometers, furrow gagers, small hoists, drills, field permeameter, portable field equipment, tensiometers, etc.
- Timely materials and supplies, with sanctions in the case of noncompliance.

16. That the National Project Direction expedite at all times the payment of salaries to the employees, especially of the regional offices, in order to avoid situations in which the employees are not paid for lengthy periods of time.

To increase the number of potential beneficiaries:

17. That the National Project Direction make all efforts that INA create and regulate a fast system to grant title to owners of farms of less than 3 hectares that wish to install irrigation systems, in accordance to the provisions of the Loan and Grant Agreement, which is of legal force.

18. That the Project continue to absorb the cost of the studies until the Project is well supported or until the moment at which it starts to operate with consultants of the private sectors. At this time, the cost must be considered an incentive for the customer and a means of promotion for the Project.

To improve the drafting of agricultural plans

19. That the National Project Director establish with the Director General of Agriculture of the SRN a system to define better the crops, yields and prices anticipated in the areas in which the Project operates.

20. That those in charge of the cultivation plans of the subprojects consult the plans, strategies, policies and laws of incentives in force for a better focus of their recommendations on the cultivation patterns on the farms.

21. That those in charge of the agricultural production with irrigation of the Project improve the cultivation guidelines with feedback of the information on production of the subprojects that are implemented and operating.

22. That those in charge of drafting the projections of production of the farms be more conservative in the yields of crops and in the ripening periods of the yields they are using at present.

23. That those in charge of the technical assistance in agricultural production and water management be in closer collaboration with their counterparts in the regional offices for the drafting of the cultivation and water management plans of the subprojects.

24. That the National Project Direction study the feasibility of installing demonstrative tracts of land to

verify information on the validity of the technological packages.

To improve the quality of the feasibility studies

25. That the foreign technical assistance supervise from closer the preparation of the subprojects and furnish the methodology and focus to draw them up.

26. That those in charge of the design of the irrigation systems prepare a better analysis of the capacity of the water sources and a brief study of the impact of the subprojects on the ecology.

27. That those in charge of the design of the irrigation systems prepare a more thorough study on drainage, especially in the projects of irrigation by gravity.

28. That the foreign technical assistance review the finished studies and, whenever necessary, discuss any modification with the authors of the design.

29. That the economists of the Project who analyze the profitability of the subproject drop the routine analysis they are performing now and that they adapt their analyses to the requirements of the farmers and the banks. (For example: neither the farmer nor the bank are interested in the internal return rate. They are more interested in other things related to the effective use of the working capital, the cash flow, the break-even point, securities, etc.)

To speed up and energize the construction

30. That the National Project Direction maintain a very close supervision of the work of the credit component, observing the performance of its new director. It has to be remembered that the credits have to be approved before the constructions of the irrigation systems can be carried out and if this does not happen, it is possible that construction can be delayed.

31. That the National Project Direction allow the construction of irrigation systems by independent builders if it should be beneficial to the farmer or the subproject.

To improve the relationship with the DGRH

32. That the National Project Direction and the DGRH agree on the establishment of a system through which, as of the forthcoming 1990 Action Plan, they both set forth

concrete, joint work objectives and goals.

33. That the National Project Direction and the DGRH start to draft an understanding so that, as of 1990, the DGRH start to carry out a program of micro-irrigation subprojects.

VI. MODIFICATIONS RECOMMENDED FOR THE ORIGINAL DESIGN OF THE PROJECT

In order to continue with the execution of the Project it is recommended that modifications, in accordance with Alternative IV., be made to the original design. These changes are based on the below premises:

- (a) The goals projected in the original design of the Project excessive high in relation to the capacity of the executing institutions, the receptivity of the farmers, and the willingness of the commercial banks to carry out irrigation subprojects in Honduras.
- (b) The results obtained by the execution of the Project until May 31, 1989, confirm the foregoing premise that the current capacity of the country to execute irrigation subprojects is lower than the one anticipated in the Project Document and the Loan and Grant Agreement. By capacity there is understood the entirety of the institutional, legal, technical, methodological, and logistical elements that are necessary for the planning and the execution of irrigation activities.
- (c) The Project does not have and would not have the capacity to achieve the objectives and goals projected in the original design within the still remaining period of execution of the Project; also, the available budget would not suffice.

In view of the foregoing, it is recommended to make the hereafter explained adjustments, which are summarized in the Logical Framework on the next page.

The modifications and goals take into consideration the total current capacity of PRORIEGO to execute the Project, the need of having to incorporate the DGRH to carry out the micro-irrigation subprojects, and the requirement to increase the approval rhythm of loans. It has to be noted that the modifications recommended are suggestions from the evaluating team that have to be refined prior to be adopted.

The recommended modifications are as follows:

REGARDING THE PURPOSE

If the Project would meet its purpose in its modified form, the Project could contribute to benefit a maximum of 1,731 farmers, increasing their gross family income of US\$1,912 without irrigation in 1989 to US\$6,740 with irrigation in 1993. (In comparison, the original design contemplated that 3,000 families of farmers would benefit, increasing their original income by 15%.)

LOGICAL FRAMEWORK OF THE IRRIGATION DEVELOPMENT PROJECT
WITH THE MODIFICATIONS RECOMMENDED FOR THE ORIGINAL DESIGN WITH ALTERNATIVE IV

OBJECTIVES	GOALS	MEANS OF VERIFICATION	IMPORTANT HYPOTH.
AIM			
Increased income of beneficiary agricult. producers	Year 4 5 6 7 20 88/89 89/90 90/91 91/92 92/93 2000		
	No. of benef. families	31 546 881 1,306 1,731 1,731	
	100\$/family		
	Family income w/irrig.	1,518 6,174 6,587 6,660 6,740 6,941	
	Family income w/o irrig	--- 1,912 1,912 1,913 --- ---	
Total family income	6,425 6,386 8,499 8,573 8,740 8,941		
PURPOSE			
Increase of production and agricultural productivity	Year 4 5 6 7 20		
	Cultivated area (ha)	3,040 3,040 3,040 3,040 3,040 3,040	
	With irrigation	100 825 1,370 2,395 3,040 3,040	
	Without irrigation	2,940 2,205 1,670 735 --- ---	
	Production (000 M/T)		
	With irrigation	0.6 14.7 28.9 43.3 58.0 59.8	
	Without irrigation	19.5 16.6 9.7 4.9 --- ---	
	TOTAL	20.1 31.3 38.6 48.2 58.0 59.8	
	Overall productivity (MT/ha)		
	With irrigation	0.9 17.6 18.4 18.8 19.1 19.7	
Without irrigation	6.6 6.6 6.6 6.6 --- ---		
Increase	5.7 11.0 11.8 12.2 19.1 19.7		
PRODUCTS			
Component I			
	Year 4 5 6 7		
	88/89 89/90 90/91 91/92 92/93		
1. Feas. studies of sub-projects, prepared by PRORIEGO	1. Number of studies	60 60 60 60 60	1. Studies
2. Feas. studies of sub-projects of micro-irrig. prepared by DGRH	2. Number of studies	60 60 60 60 60	2. Studies
3. Subprojects' execut. by PRORIEGO	3. Subprojects (ea. 15 ha average)	40 40 40 40 40	3. Records of the Project
4. Subprojects execut. by the DGRH	4. Subprojects (ea. 3 ha average)	45 45 45 45 45	4. Records of the Project and DGRH of const. carried out
	5. (Various means)		
	6. (No. of qualified)	37 37 38 38	5. Promotion programs carried out
	7. (No. of qualified)	45 45 45 45	6. List of courses and qualified personnel
	8. (No. of qualified)	350 450 600 600	7. List of courses and qualified personnel
	9. (No. of visits)	1,200 2,266 2,818 2,214	8. List of courses and farmers
	10. (number)	40 40 40 40	9. Record of visits of extension workers
	11. (US\$000 approved)	1,620 1,620 1,620 1,620	10-12. Record of credits approved of Component III
	12. (US\$000 approved)	1,700 1,700 1,700 1,700	13. Documents
	13. The objectives and goals of the DGRH are defined with the assistance of two specialists in hydraulic resources management, one foreign and one domestic, and a foreign specialist in direction and management.		14. Plan Document
	14. Once the objectives and goals of the DGRH are defined, an Annual Action Plan with managerial outlook is prepared. The same specialists of Product 13 assist in the preparation.		15. Document and official institution of establishment of the structure
	15. To execute the prepared Action Plan, the same specialists of Product 13 recommend and have approved a new organizational structure.		16. Inspection
	16. PRORIEGO analyzes the requirements of office and work equipment of the DGRH and assists in the implementation of same.		17. Progress reports of the Plan
	17. PRORIEGO supervises the execution of the Action Plan of the DGRH, furnishing orientation based on its experience in the use of the SMP in the execution of the 1989 Action Plan.		
Component II			
5. Irrigation promotion, carried out			
6. Training of professionals, carried out			
7. Training of technicians, carried out			
8. Training of farmers carried out			
9. Extension services rendered			
Component III			
10. Credits approved by banks			
11. Approved amount of investment credit			
12. Amount of equipment credit approved			
Component IV			
13. Defined objectives of the DGRH			
14. Annual Action Plan of the DGRH, prepared			
15. Organizational structure of the DGRH, established			
16. DGRH offices, equipped			
17. Supervision of the execution of the DGRH Action Plan			

REGARDING THE PURPOSE

With the current capacity of the Project, the speeding-up of the credit approval and the participation of the DGRH in the preparation of the studies and the construction of the micro-irrigation subprojects, the maximum surface area that could be irrigated until the end of the Project in 1993 would be of 3,040 hectares. Of these, PRORIEGO would irrigate 2,500 ha and the DGRH 540 ha. (In comparison, the original design estimated that the Project was going to irrigate 6,627 ha.)

Regarding agricultural production, it would increase from 19,500 MT without irrigation in 1989 to 58,100 MT with irrigation in 1993. (In comparison, the original design estimated that it would increase to 90,000 MT at the end of the Project.)

Finally, the overall agricultural productivity of the areas incorporated into the irrigation system would increase from 6.6 MT/ha in 1989 to 19.1 MT/ha in 1993. (In comparison, the original design estimated that it would increase to 13.6 MT/ha at the end of the Project.)

REGARDING THE PRODUCTS

The four components are kept because they are considered necessary but they are separated in a more concrete manner, so that their execution could be easier programmed. The separation does further facilitate establishing the bases to assign to the DGRH the products whose execution corresponds to it.

It is recommended that 17 products be carried out. Of these, 4 correspond to the component Design & Construction of Irrigation Systems, 5 to the component of Promotion, Extension and Training, 3 to the Credit component, and 5 to the Institutional Strengthening component. (see Logical Framework.) The extent of the Products reflects the efforts necessary to be carried out in order to meet the modified Purpose. (In comparison, the original design was rather general in respect to the goals of the Products, especially those of the component of Promotion, Extension and Training, and of the component of Institutional Strengthening.)

The Product corresponding to the construction of irrigation systems includes the construction of 85 annual systems. Of these, 40 with an average area surface of 15 hectares each would be constructed by PRORIEGO, and 45 with a average area surface of 3 hectares each would be constructed by the DGRH. The first ones would be systems similar to those that PRORIEGO is constructing at present for clients that qualify as credit[worthy] subject by the commercial banks, and the latter

ones would be very small systems of a very simple design and simple construction, such as it was contemplated in the Loan and Grant Agreement.

The Product corresponding to Credit was estimated at a total of US\$13.3 million for the 4 remaining years of the Project. Of these, it is calculated that US\$6.5 million would be for investment credit. The 21% of the equipment credit would be to take care of the working capital requirements of the subprojects managed by the DGRH. If thereto is added the amount of credit programmed for 1989, the total credit amount the Project would need during its useful life until 1993 would be of approximately US\$14.5.

REGARDING THE COST

The available budget of the Project as of April 30, 1989 was of US\$25.4 million, of which, among others, US\$13.7 were for credit and US\$2.4 million were for Domestic Technical Assistance.

The estimated budget to execute the Project with Alternative IV is of US\$24.5 million, including US\$13.3 million for credit and US\$1.86 million for new technical assistance (see Annex 14, Table 11). The comparison of what is available with what is required shows that the budget would suffice to finance the execution of the Project with Alternative IV.

The cost to manage the micro-irrigation subprojects that would be carried out by the DGRH would be of \$650,000

REQUIREMENTS OF TECHNICAL ASSISTANCE TO CONTINUE THE EXECUTION OF THE PROJECT WITH THE RECOMMENDED MODIFICATIONS

In order to continue the execution of the Project with Alternative IV with the recommended modifications there would be required additional technical assistance. This is necessary because the technical level of the participants, both of the domestic technical assistance and of the counterpart personnel, still requires strong support in some important areas, and because it is necessary to increase the technological transfer by the original staff, which was not clearly set forth due to the delay the Project had in being implemented. Also, it is necessary because the current foreign technical assistance is reaching the end of its contract.

The make-up of the additional technical assistance that is required is as follows:

Foreign Technical Assistance

For the Component of Design and Construction of irrigation systems.

1 engineer, specialized in the preparation of irrigation projects. 2 years, starting in 1990.

1 agricultural engineer, specialized in agricultural production with irrigation. 1 year, starting in 1990.

1 specialist in water management on farms. 2 years, starting in 1990.

1 specialist in construction of hydraulic works. 6 months, starting in September 1990.

For the Component of Institutional Strengthening

1 specialist in hydraulic resources management. 3 months, starting in August 1989.

1 specialist in direction and administration (management). 2 years, starting in September 1989.

For the Component of Promotion, Extension and Training

1 specialist in promotion, extension and training. 2 years, starting in September 1989.

1 specialist in farm management. 2 years, starting in 1990.

Domestic Technical Assistance

For the Credit Component

1 specialist in credits with commercial banks. 1 year, starting in October 1989.

For the Component of Industrial Strengthening

1 specialist in hydraulic resources management. 3 months, starting in August 1989.

In short, there are required additional 120 man/months of foreign assistance and 15 man/months of domestic assistance. The approximate cost of these additional consulting services is estimated at US\$1.86 million. The terms of reference of each of them are presented in Annex 16.

Concomitantly, the technical assistance by AGROTECNIA should be strengthened with an agro-economist to assist the Design

Engineer with his work in the regional offices. This would allow that more attention be paid to the agricultural aspect of the subprojects, which had been neglected in the past. Additionally, the Project should require from AGROTECNIA that it redefine the terms of reference of the rural sociologist to direct his work to concrete objectives, especially the identification of the beneficiaries and the training of groups and cooperatives of farmers. The costs for this strengthening of AGROTECNIA should be discussed with AID and the National Direction of the Project.

VII. THE PROJECT, THE DGRH, THE PRIVATE SECTOR AND THE LIFE OF THE PROJECT AFTER 1993.

In order to connect the Project, the DGRH and the Private Sector, interested in irrigation activities, it is fundamental to understand the objectives and functions of each of them.

The Project has as objective "develop" irrigation in Honduras, a country which does not have ample experience in this respect. This means that what it really does is: (a) make known the advantages of irrigation in agriculture in the country; (b) help the DGRH to develop or improve the institutional, legal and technical instruments to regulate the use of water for irrigation in the country; (c) to train and qualify professionals and technicians so that they can function both in the public and the private sectors in irrigation activities; (d) to establish an institutional infrastructure and national and regional techniques to develop irrigation activities; and (e) to waken the interest of the producers and of the private banks in the financing of irrigation systems. The part currently played by the Project in the design and execution of irrigation subprojects must be considered as the laboratory in which professionals, technicians and farmers are trained for the future, both for the public and private sectors, and not as an activity which is competing with the private sector for work opportunities.

The DGRH, as representative of the public sector in water matters, has as objectives: (a) regulate the use of water for its various uses, among them, the one for agriculture, in accordance with the provisions of the law or of the Water Code; (b) to plan and execute water programs or projects which, because of their magnitude or importance, are of national priority or require the participation of the state; (c) to plan and execute water programs and projects which tend to benefit less developed areas of the country and agricultural producers of scarce economic resources.

The private sector, interested in irrigation activities, made-up of producers, suppliers of production factors, equipment and machinery, consultants, builders and banks, has as objectives: (a) to use the waters for their use in agricultural or cattle production; (b) to supply professional and technical services for the preparation and execution of the irrigation projects; (c) to supply equipment and input for the installation of irrigation systems; and (d) to finance the execution of irrigation projects and systems.

As it can be seen, the three entities have different objectives which are not contrary to each other but complement each other. If the objectives of each are understood, there can be projected the manner in which the Project could be

reincorporated into the DGRH in 1993, and how the private sector could interact with the Project and the DGRH before and after that date.

The reincorporation of the Project into the DGRH, unless other decisions are taken, would have to take place in 1993, at the end of the seventh year of its execution. This could efficiently take place if it were concretely programmed in the Annual Action Plans of the Project. The programming would have to be done by taking into consideration the objectives inherent to the DGRH and which are within the possibilities of the Project. For example, in the 1990 Action Plan, the Project could start the reincorporation process by assisting the DGRH to strengthen itself institutionally, that is to say, assisting it in a clear definition of its objectives, that it prepare a good annual action plan, and that it establish a better organizational structure. Additionally, it could assist it with the regulations of the Water Act, once it is ratified by Congress; also, that it train its professionals and technicians in the design and execution of irrigation systems, and that it apply uniform design and construction standards. Finally, in order to establish a better professional and technical contact with the DGRH, the Project could program the participation of the DGRH in the preparation of feasibility studies and the execution of micro-irrigation subprojects, such as it is set forth in Alternative IV, wherein it is recommended to continue the Project. Afterwards, in the 1991, 1992 and 1993 Action Plans, the Project could continue programming other support activities for the DGRH, so that they would continue strengthen it technically and operationally, whereby the total reincorporation of the Project into the DGRH could take place in an orderly and timely manner in 1993.

Once reincorporated into the DGRH, the Project would cease to be a project and its professional and technical personnel that choose to remain with the DGRH would constitute a specialized unit whose functions would be to standardize the use of water for agricultural cultivation, design, build and supervise irrigation systems, in which the private sector would have to participate, such as projects of national importance or support projects for the most needy producers. As a result of having worked with the Project, said personnel would be well qualified and have great knowledge of the needs of the private sector in irrigation matters. The budget for the work of the unit could be partly or wholly financed with resources from the recovery of the loans of the Project, granted in previous years. (See estimated calculation in Annex 15.) The system, the amounts and the allocation of the resources to finance the operation of the unit would have to be discussed and agreed upon during the reincorporation process of the Project in 1993.

The private sector interested in irrigation activities could participate at any time in various manners. The producers, requiring technical support and credit; the consultants and builders, offering consulting services in the design, construction and supervision of irrigation systems; and the banks, offering credit to the subprojects generated by the Project or by private consultants. Such as contemplated in Alternative IV, wherein is recommended to continue the Project, the Project would be in charge of eliminating the current constraints that do not allow or hinder that private consultants participate in the activities of the Project, preparing feasibility studies of irrigation subprojects. This would be carried out more intensively as of the end of the technical assistance contract of AGROTECNIA in 1990.

In summary, the Project could be reincorporated into the DGRH in 1993, in an orderly and timely manner. This would require an annual programming and attention to the institutional strengthening of the DGRH. As of 1993, the Project would not exist as such and its personnel would constitute a specialized unit within the DGRH, whose operation would be wholly or partially financed with resources from the recoveries of the loans by the Project. The private sector, interested in irrigation activities, made-up of producers, suppliers, consultants, builders and banks, could participate before and after the reincorporation of the Project into the DGRH, requesting technical support and credit, offering consulting services to private customers or offering credits. The current constraints of participation of private consultant in the feasibility studies of subprojects would be eliminated by the Project, such as it is recommended in Alternative IV to continue with the execution of the Project.

VII. LESSONS LEARNED

The execution of the Project until 1989 has shown as follows:

- Sufficient time should be given to the projects, at least one year, to be implemented, to fulfill the condition precedents and to start before expecting from them major results.
- The direction of the technical assistance, assigned to the projects, should be assigned to individuals of proven "managerial" experience rather than technical one.
- It should be avoided that discrepancies exist between the various legal instruments that cover the execution of a project, such as it was the case of the terms of reference of the executing entity and of the technical assistance team of the Project. This could be achieved in that the clauses of the Agreement of a project be clearly set forth and requiring that the other documents be in conformity with them.
- The execution of key aspects of a project (such as it was the case of the credit system of the Project) should be placed in the hands of experienced and specialized individuals and not in the hands of experienced people.
- The part played by the officials of the project and of AID should be more of orientation than of supervision and the their positions regarding key aspects of the projects should be more stable and less changing.
- The direct support by AID to the project as regards acquisitions and contracting should be more efficient, avoiding by all means the long delays suffered by the Project.
- During the preparation of the feasibility studies there should be avoided by all means that the objectives and goals be projected with much optimism as it was the case with the Project. It should also be avoided that there be overestimated the receptivity of the beneficiaries and the good will of the institutions (such as the private banks in the Project) to participate in the projects.
- The preparation of documents, such as Project Agreement should be done with more carefully and its translation should be more faithful to the original. As regards Annex I, it should more adequately reflect the information contained in the Project Document.

- The executives should faithfully pursue the objectives and goals of a project during its execution and not, as it was the case with PRORIEGO, abandon the primary target beneficiaries in order to dedicate themselves to benefit other more suitable customers.

SCOPE OF WORK

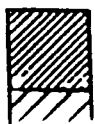
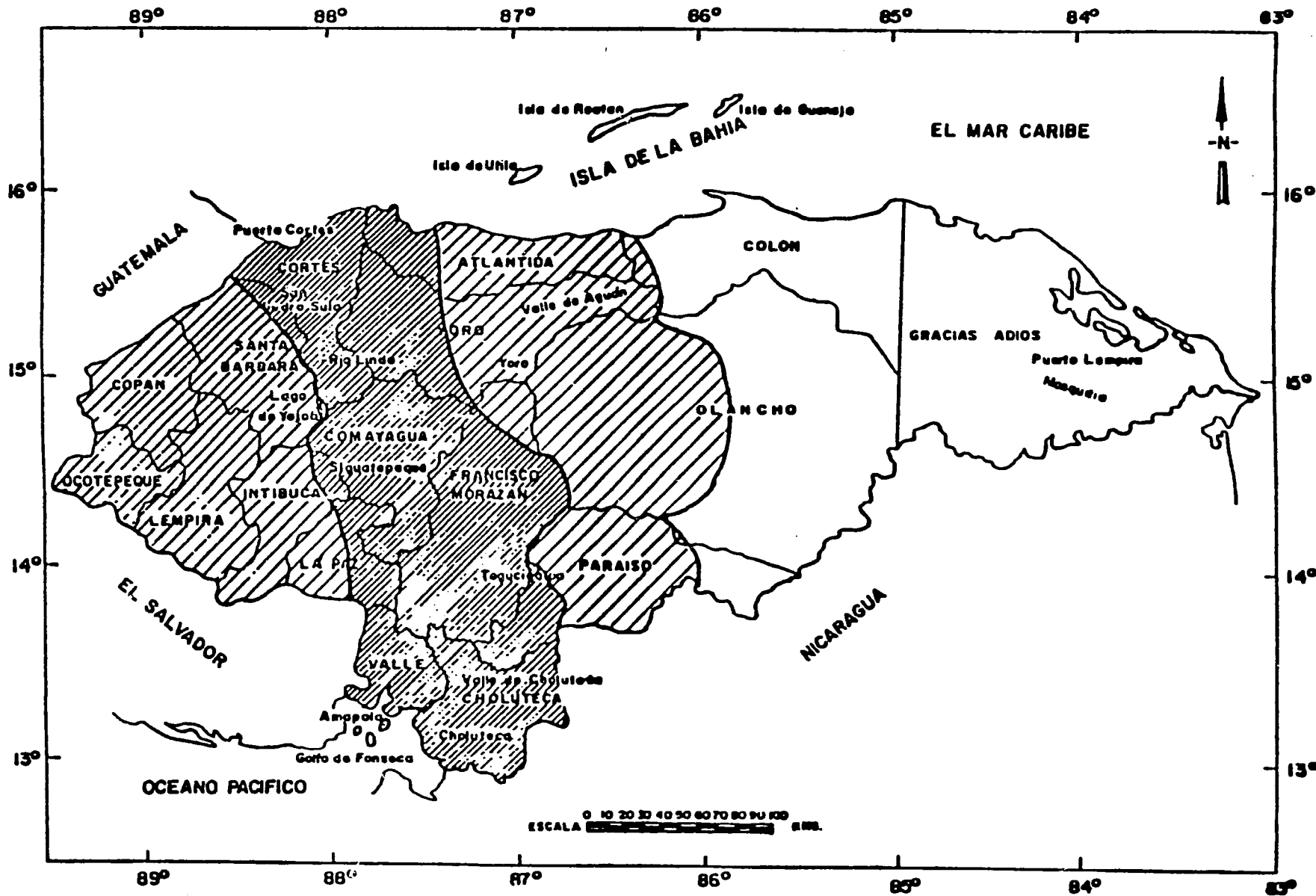
A. The Contractor shall perform the following tasks:

Task 1 - Execution of Interim Evaluation

The Contractor shall conduct an interim evaluation of the project that assesses progress and implementation constraints, determines the validity of the original project design as effected by implementation delays and current project credit policies, and recommends appropriate action. Specifically, the contractor shall:

- a) Review the project design and determine how the operational setting is affecting the way in which the project is being implemented. This shall include assessing the impact on the original design of implementation delays, credit policies, DRH institutional weakness and other constraints which the contractor may identify. This review shall also assess the ability of the project to reach the PP defined project beneficiary groups and the importance of various beneficiary groups to attaining the project purpose.
- b) Review implementation progress and identify shortfalls in attaining output targets, and propose realistic targets.
- c) Determine the cause(s) of identified shortfalls in output targets, assess the current situation regarding circumstances which continue to constrain project implementation and/or prevent the project from reaching planned beneficiaries.
- d) Based on the above analyses, provide USAID/Honduras with a set of recommended alternatives for resolution of implementation problems. The following alternatives shall be considered: i) continuing as is, ii) reprogramming activities within basic project structure, iii) revising project via a PP supplement and changes to Annex One of the ProAg, or iv) shutting the project down. Alternatives should include concrete changes at the input level (i.e., technical assistance, credit, GOH resources and organizational support) and at the output level (i.e., number of irrigation systems designed and constructed, amount of credit disbursed and appropriate institutional changes).
- e) If the alternative iii above is agreed by GOH and AID, assist USAID/Honduras staff in preparation of documentation required to implement evaluation recommendations (e.g., assisting ARDO staff with drafting of documentation for a PP supplement and amendment to Annex One of the Project Agreement.

REGIONS THE PROJECT WILL COVER



REGIONS OF INITIAL ACTIVITY (First phase of the Project)

REGIONS OF SUBSEQUENT ACTIVITY

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LIST OF INDIVIDUALS INTERVIEWED

<u>INSTITUTION</u>	<u>POSITION</u>
1. <u>PRORTEGO</u>	
Roberto Rivera Lanza	Director
Hector Tablas	Chief, Component I
Pedro Vasquez	Chief, Component II
Ernesto Távora	Chief, Component III
Mario Moradel	Production
Mario Rodriguez	Construction, contracts
Martinez	Social Promoter
Eduardo Moncada	Agrarian Credit
Patricia Andino	Training Coordinator
Manuel Vargas	Agrarian Economics
Luis R. Martinez	Social Promoter
Fernando Navas	Social Promoter
Jorge Euceda	Irrigation Extension
Francisco Padilla	Regional Director
Jorge Cabrera	Eng. Supervision & Constr.
René Sandoval	Irrigation Extension
Francisco Sánchez	Administrator
Aquilez Gómez	Irrigation Extension
Erick Espinoza	Soils
Oscar Lara	Supervision & Construction
Sandra López	Economist/Credit
Miguel A. Turcios	Regional Director, Choluteca
Mario Chinchilla	Irrigation Extension
Carlos Colindres	Irrigation Extension
Malcolm Lainez	Water Management
Suyapa Narvaez	Economist/Credit
Ana S. Longharez	Super. and Construction
Elías Nazar	Regional Director
Manuel Ramirez	Water Management
Saul Escoto	Administrator
2. <u>USAID/HONDURAS</u>	
David Schaer	Director, OARD
Mike Maxey	Dep. Director, OARD
Armando Busmail	Liaison Official
Richard Whelden	
Carmen Zambrano	Evaluation Official
Robert Wilson	
Jim Athanas	Contract Official
John Warren	Project Official
Guillermo Bolaños	

3. S.R.N.

José Montenegro	Asst. Secretary of N.R.
Leopoldo Alvarado	Director General of Agriculture
Arnulfo Hernández	Regional Asst. Director
Cecilio Fermufino	Head DPG of Extension
Oscar Vasquez	Head, Livestock
Omar Hernández	Regional Director
Omar Hernández	Regional Director
Luis López	Assistant Director
Minor Castillo	Chief, Extension

4. DGRH

Florentino Soriano	Regional Director
Mario Maresma	Director General
Jaime Lanza	Assistant General Director
Alba de Rodríguez	Chief, Irrigation & Drainage
Florentino Zamora	Department Head
Ramón	Water Management S.P.S.
Roberto Paz Abogabir	Regional Director, IRN-Comayagua

5. WINROCK

Carlos Garcés	Chief, Technical Assistance
Enrique Castellón	Consultant, Credit Chief
Ciro Villamizar	Consultant, P., E., C.
Carlos Valderrama	Chief, Technical Assistance

6. HARZA

Ben Grover	Consultant, Agricult'l. Product.
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7. COLORADO STATE "U"

Jim Evans	Consultant, Irrigation Mgt.
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8. AGROTECNIA

Fernando Escobar	Design Engineer
Henry Kurwbon	Design Engineer
Alejandro Suazo Lang	Design
Oscar Benitez	Administrator
José Luis Lara	Agronomist I
Ricardo Pacheco	Agronomist II
Gustavo Laguna	Agronomist III
Roberto Cáceres	Sociologist
Carlos Rodriguez	Project Economist
Enrique Jácome	President

Andrés Zelaya
Fernando Escobar
Gener Pineda
Manuel Ramirez
Roñando Calderón
Bayardo Salgado
Aguilez A. Gómez
Eric Espinoza
Gener Pineda

Administrator
Design/Coord.
Agronomist I
Agronomist II
Design Coordinator
Agronomist I
Agronomist II
Agronomist II
Agronomist I

9. CEDA

Napoleón Reyes Disqua
José Mendez

Director
Professor

10. INA

Luis Pineda
Jesus Mejía Figueroa

Consultant

11. BANCO CENTRAL DE HONDURAS

Gonzalo Fúnez

Director, Credits & Securities

12. SUPERINTENDENCE OF BANKS

Fernando Vega

Superintendent of Banks

13. FIA

Wilfredo Modenessy

General Manager

14. BANCO SOGERIN

Mario Reyna
Leonidas Garcia

Regional Manager
Reg. Coord. of Agric. Credit

15. BANCO DE LOS TRABAJADORES

Gustavo Zelaya

Mgr., Agricultural Credit Dept.

16. BANCO ATLANTIDA

Guillermo Bueso

General Manager

17. BANCO HONDUREÑO DEL CAFE, S.A.

Carlos Canizales

General Manager

18. CONSTRUCTION COMPANIES

Grupos Técnicos de Ingeniería S.A. Pedro Pineda
Serpic S. R. L. Saúl Bran
Contratista Asociados S.A. Juan Moncada
Consortio Hogares Federico Breve - Service

19. PRIVATE INDIVIDUALS

Ernesto Bordy

Consultant

Miguel Iardizabal

Consultant

20. SUBPROJECTS RONDON DEL CARMEN

Julio Espinoza

Producer

Constantino López

Producer

Delmer Montoya

Producer

Fausto Bográn

Producer

21. SUBPROJECT GUADALUPE

Plutarco Vega

Producer

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- 52 - Potential market for selected fruits and vegetables - Dr. A. Madsen - Consulting Report - 1988.

- 53 - Diagnosis on the water management of a farm. PRORIEGO 1988.
- 54 - Administrative Study. J. Schlafeldt. Consulting Report 1988.
- 55 - Analysis of the situation of the credit element. E.A. E. Castellón. 1988
- 56 - PRORIEGO regulations on grants and training. 1988
- 57 - Monthly precipitation probabilities for moisture availability for Honduras - G. Hargreaves.
- 58 - Achievement Report of PRORIEGO. Director, Component I. April 1989.
- 59 - Credit Program. Irrigation Development. Memorandum J. Jordan 1988.
- 60 - Trust situation of BANADESA. Memorandum E. Castellón 1989.

SUMMARY OF THE PROJECT IMPLEMENTATION LETTERS

- PIL #1. Dated Nov. 10, 1986. Extended the deadline to submit to AID the opinion of the Attorney General with regard to the validity of the signed Project Loan and Grant Agreement. Also, it extends the deadline to submit to AID a statement with the names of the persons holding or acting on behalf of the borrower/grantee. The deadlines were extended until Nov. 30, 1986.
- PIL #2. Dated Dec. 5, 1986. Extended the deadlines mentioned in PIL #1 until Jan. 12, 1987.
- PIL #3. Dated Jan. 20, 1987. Declared conditions precedent mentioned in PIL #1 and PIL #2 fulfilled.
- PIL #4. Dated June 3, 1987. Provided additional information regarding the use of funds of the Project to assist the Government in the implementation of the Project in accordance with the Project Loan and Grant Agreement.
- PIL #5. Dated Jun. 18, 1987. Accepted the Government's "Criteria for selection of small irrigation projects" and "Environmental impact criteria to be utilized in the Irrigation development Project." Declared fulfilled the Conditions Precedent 5.2 (a) and (b) of the Agreement relating to those matters.
- PIL #6. Dated Jun. 16, 1987. Extended the deadline to comply with Condition Precedent 5.2 (a) (b) and (c) (Financing Facility) until June 29, 1987. Also, it allowed the procurement of vehicles and other equipment necessary to carry out the Project activities during the first year prior to satisfactory compliance of the above mentioned Condition Precedent.
- PIL #7. Dated July 21, 1987. Extended the deadline to comply with Condition Precedent 5.2 (c) relating to the establishment of the Financing Facility for the Project. The deadline was extended until Oct. 31, 1987.
- PIL # 8. Dated Aug. 5, 1987. Confirmed the specific line item budget for 1987 counterpart funding for the Project. Provided the first L. 400,000 for calendar year 1987 out of the L. 800,000 programmed for the Project in PIL #135 of the Economic Stabilization Facility (522-0283) dated May 12, 1987.
- PIL #9. Dated Oct. 27, 1987. Approved the use of Project Funds to repair 5 vehicles of the DGRH to place them for service of the Project.

- PIL #10 Dated dec. 17, 1987. Extended the deadline to establish the Financing Facility as per Condition Precedent 5.2 (c) of the Agreement. The deadline was extended until Jan. 31, 1988.
- PIL #11 Dated May 13, 1988. Modified Sections 5.2 and 5.4 of the Project Agreement regarding additional disbursements. Also provided the government two more months from the signing of this letter to comply with Condition Precedent 5.2.
- PIL #12 Dated July 25, 1988. Approved the substitution of a revised budget for the original budget used as a guide in the Project Agreement. The change did not alter the total amounts.
- PIL #13 Dated June 2, 1988. Confirmed the specific line item budget for 1988 counterpart funding. Provided L. 582,000 for calendar year 1988 as programmed in PIL #11 dated March 23, 1988 of the Economic Stabilization and Recuperation Program II (522-0323).
- PIL #14 Dated . Approved the request of the DGRH made by letter dated Jun. 8 to rent two vehicles for five months each to be used by the regional offices of San Pedro Sula and Choluleca.
- PIL #15 Dated . Incorporated into the Project recommendations to improve the management of the implementation of the Project. Created the Executive Committee and the Co-Directors concept to solve prior problems. Approved the new organizational structure of the Project and instructed for the provision of adequate office facilities at the central and regional levels.
- PIL #16 Dated July 17, 1988. Approved Condition Precedent 5.2 (c) regarding the creation of the Financing Facility. Accepted the Tripartite Agreement document and its Annex on Credit Regulations.

BRIEF DESCRIPTION OF THE SUBPROJECTS VISITEDSeptember 15

It deals with a group of farmers of 14 young producers, who grow rice on 7 hectares with a double annual cycle. A rice crop near flowering stage was observed. Its condition was poor, scarcely inhabited and with a lot of underbrush.

The irrigation was insufficient due to the high losses because of deep percolation. This was due to the lack of mire at the time of planting. The irrigation system was designed for the cultivation on 4 staggered plots of land, with a total period of 1 month of planting and with mire. None of the two operations was carried out and the water was insufficient to inundate and to maintain the flooding. In the first cycle of crop in the period July-December, the yield was low, 2,306 kg/ha, due to problems of rats and flattening of the crop. This is a group that requires technical assistance during 2-3 years to adjust the water and crop operations. The irrigation system consists of one 15 l/s pump, main pipes, distribution boxes, rectangular parcels of land and irrigation from parcel to parcel.

Rondón del Carmen

This is a group of farmers consisting of 15 members of advanced age. This reduces their work capacity. Irrigation is made in furrows around 3.1 hectares and they produce corn for grain and tender corn, and vegetables, such as chile peppers, tomatoes, and watermelons. The irrigation system of perforated pipes produced good results. The specialist in water management introduced changes that did not improve the operation. The furrows are of irregular course, which limits the efficiency of the irrigation. The crops are greatly affected by underbrush and diseases, in particular, the tomatoes. The manpower is insufficient to carry out all the work on time, in spite of the great number of workers. During the cycle January-May they obtained a good yield of vegetables (chile peppers, tomatoes, watermelons). This represents a considerable increase compared with the former periodic production of corn, yucca and beans.

Las Mercedes

The owner is a good producer with experience in the production of vegetables with irrigation. He has installed a sprinkler irrigation system with own financing. He specialized in the production of cabbage in 2-3 annual cycles. He sells from his own stall at the market. The yield in the December-May cycle was of 29,737 kg/ha.

The irrigation system has main and lateral pipes with a smaller diameter than designed because the producer did not want to incur into greater expenditures. His operation is, however, adequate. The production practices are very adequate and the technical assistance he requires is minimum.

La Guadalupe

With irrigation, the producer has changed the type of crop, dedicating himself to melons for export rotating with corn. In the January-May season he obtained adequate yields, 9,409 kg/ha, in spite of problems that led him to abandon the cultivation during the last production phases. The irrigation system worked well with straight furrows and adduction with perforated pipes. He producer financed his irrigation system. He sold through a cooperative of the area which exports to the United States.

CREDIT APPLICATIONS PENDING IN THE COMMERCIAL BANKS

Name of the project	Location	Hectares to irrigate	L o a n (thousands of Lps.)			Status of the loan	Bank
			Fixed invest.	Working capital	Total amount		
ILA SELVA	IGUALI, EL PARAISO	47.0	234.70	151.50	426.20	APROBADO POR COMITE DE CREDITO BANCO	BT
ILA CIENAGA	ICOMAYAGUA	4.0	12.70	19.20	34.50	APROBADO POR COMITE DE CREDITO BANCO	BT
VALLE FLOR	ICOMAYAGUA	1.7	23.30	62.20	124.20	APROBADO POR COMITE DE CREDITO BANCO	BT
ILAS NEGAS II	IVILLA DE SAN NTONIO	3.0	17.50	17.40	34.50	APROBADO POR COMITE DE CREDITO BANCO	FIA
EL CARRIZAL	TOPATORO, LA PAZ	7.0	25.50	20.70	50.60	APROBADO POR COMITE DE CREDITO BANCO	FIA
EL TABLON DE LEON	ICHAMPAMENTO, OLANCHO	13.2	34.34	74.46	109.00	APROBADO POR COMITE DE CREDITO BANCO	SCG
MARIO PINEDA	ICHOTEPE, CORTES	11.3	47.90	94.70	142.60	APROBADO POR COMITE DE CREDITO BANCO	BT
LINA LUCY	ICHOLONA, CORTES	64.0	213.00	128.00	341.00	CLIENTES REMIT. POR BANCO FALTA ESTUD.	SOG
ELEONORA	ICHOLONA, CORTES	64.0	213.00	128.00	341.00	CLIENTES REMIT. POR BANCO FALTA ESTUD.	SOG
VILLA ENILLIA	ICHOLUTECA	7.0	36.20	74.00	110.20	APROB. POR COMITE DE CREDITO BANCO	BT
EL PALENQUE	ICHOLUTECA	20.0	75.60	206.36	281.96	EST. FINAL EN INC. REF. BANCARIAS EMC.	SQB
RIO BRANCO	ICHOLUTECA	4.0	15.50	44.40	59.90	TRAM. FINALES DE COCULIESTACION	FIA
PLANTACIONES CONTINENTAL	ICHOLUTECA	200.0			800.00	APROB. JUNTA DIRECT. BCO. FALTA ESTUDIO	CONT
BANISERA CUIRISTAN, S.A.	SANTA BARBARA	20.0			200.00	APROB. JUNTA DIRECT. BCO. FALTA ESTUDIO	CONT
COCCORILUS CONTINENTAL, SA	SANTA BARBARA	60.0			200.00	APROB. JUNTA DIRECT. BCO. FALTA ESTUDIO	CONT
PAROCERA LA LAMA SA DE CV	ICHOLONA, CORTES	140.0			700.00	APROB. JUNTA DIRECT. BCO. FALTA ESTUDIO	CONT
ICACAO CONTINENTAL SA	IONDA CORTES	200.0			900.00	APROB. JUNTA DIRECT. BCO. FALTA ESTUDIO	CONT
CONASA	ILA LIMA, PROGRESO	105.0			2400.00	APB. A TRAVES UPCA, LO HAN POR LEGO. F. EST.	SOG
JOSE RICARDO EINETS	ISAN PEDRO SULA	300.0			600.00	APB. A TRAVES UPCA, LO HAN POR LEGO. F. EST.	SOG
		1,301.5	992.0	1163.9	7546.0		

OBSERVATION: Due to their extension, the subprojects with areas greater than 150 ha could be discarded as credit subjects of the Project. This would mean a reduction of US\$1.15 million from the figure shown in the Table.

C E R T I F I C A T I O N

Jaime Rosenthal, President by delegation of the Board of Directors of the BANCO CONTINENTAL, S.A. APPROVES the item of agenda, which reads in verbatim:

RECORD No. 148	ITEM No. 13	LETTER "E"
BORROWER:	ARROCERA LA LAMA, S.A. DE C.V.	
AMOUNT:	LPS. 700,000.00	
TYPE OF LOAN:	Mortgage	
PURPOSE:	Construction of an irrigation and drainage system for a rice plantation on two hundred "manzanas" located in La Lama, Choloma.	
INTEREST RATE:	16%	
FUNDS:	Proriego, Ministry of Natural Resources/AID BANCO CENTRAL 522-0268/at interest rates of 12%.	
TERM:	As set forth in the Proriego study.	
MANNER OF PAYMENT:	As set forth in the Proriego study.	
SECURITY:	First mortgage on two hundred "manzanas" with all of its improvements located in La Lama, Choloma. Letter of guaranty by the Banco Central de Honduras for 30% of the loan.	

s/ illegible
ING. JAIME ROSENTHAL, President
BOARD OF DIRECTORS

May 29, 1989

Translator's Note: 1 manzana = 69.9 ares

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C E R T I F I C A T I O N

Jaime Rosenthal, President by delegation of the Board of Directors of the BANCO CONTINENTAL, S.A. APPROVES the item of agenda, which reads in verbatim:

RECORD No. 148 ITEM No. 13 LETTER "G"

BORROWER: GANADERA QUIMISTAN, S.A. DE C.V.

AMOUNT: LPS. 200,000.00

TYPE OF LOAN: Mortgage

PURPOSE: Construction of an irrigation system for fifty "manzanas" located at the Hacienda Quimistan of Ganadera Quimistan, S.A.

INTERESTS RATE: 15%

FUNDS: Proriego, Ministry of Natural Resources/AID BANCO CENTRAL 522-0268/at interest rates of 12%.

TERM: As set forth in the Proriego study.

MANNER OF PAYMENT: As set forth in the Proriego study.

SECURITY: Third mortgage on Hacienda Ganadera Quimistan, S.A. with all improvements and collateral on machinery and cattle.

s/ illegible
ING. JAIME ROSENTHAL, President
BOARD OF DIRECTORS

May 29, 1989

Translator's Note: 1 manzana = 69.9 ares

C E R T I F I C A T I O N

Jaime Rosenthal, President by delegation of the Board of Directors of the BANCO CONTINENTAL, S.A. APPROVES the item of agenda, which reads in verbatim:

RECORD No. 148 ITEM No. 13 LETTER "H"

BORROWER: PLANTACIONES CONTINENTAL, S.A. DE C.V.

AMOUNT: LPS. 800,000.00

TYPE OF LOAN: Mortgage

PURPOSE: Construction of an irrigation system for two hundred "manzanas", planting of rice and, subsequently, macademia nuts, at Lago de Yojoa.

INTEREST RATE: 14%

FUNDS: Proriego, Ministry of Natural Resources/AID BANCO CENTRAL 522-0268/at interest rates of 12%.

TERM: As set forth in the Proriego study.

MANNER OF PAYMENT: As set forth in the Proriego study.

SECURITY: First mortgage on two hundred manzanas" of land in Las Vegas, Santa Bárbara, with all of its improvements, and collateral on equipment.

s/ illegible
ING. JAIME ROSENTHAL, President
BOARD OF DIRECTORS

May 29, 1989

Translator's Note: 1 manzana = 69.9 ares

STATUS OF THE PRORIEGO CREDITS AS OF MAY 31, 1989

	SAN PEDRO SULA					COMAYAGUA					CHOLUTECA				
	BANCO DE LOS TRABAJADORES FIDENSA SOCEPIN FIA CONTINENTAL					BANCO DE LOS TRABAJADORES FIDENSA SOCEPIN FIA CONTINENTAL					BANCO DE LOS TRABAJADORES FIDENSA SOCEPIN FIA CONTINENTAL				
No. of petitions of eligibility sent to banks	3	2	11	--	6	11	--	2	7	2	14	--	3	2	--
No. of petitions of eligibility appr. by banks	3	1	5	--	5	6	--	2	6	1	9	--	1	2	--
No. of loan applications presented to banks	3	--	3	--	--	5	--	2	--	--	8	--	--	2	--
No. of loans approved by banks	1	--	2	--	--	--	--	1	--	--	--	--	--	--	--
Amount of loans approved by banks 1/	74,050	39,000	37,951	--	--	--	--	50,167	--	--	--	--	--	--	--
Amount of disbursements for approved loans	12,500	39,670	5,000	--	--	--	--	26,310	--	--	--	--	--	--	--
No. of irrig. systems under construction	1	--	2	--	--	--	--	1	--	--	--	--	--	--	--
No. of has. to irrigate through approved loans	20	--	55	--	--	--	--	17	--	--	--	--	--	--	--

1/ With resolution of credit

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ANNEX 8

ANALYSIS OF THE REQUIREMENT OF COUNTERPART FUNDS
OF THE PROJECT UNTIL 1993
(In thousands of dollars)

Total budgeted counterpart	10,450
Less: Credit funds	(5,000)
Contributions in kind	(1,750)
Balance	3,750
Less: Expenses 1987	(103)
Expenses 1988	(313)
Expenses 1989	(821)
Total available as of 1990	2,493
Less: Salaries and wages 1990/1993 ^{1/}	(3,200)
Deficit	(700)

^{1/} At a rate of \$800,00 per year, which includes \$120,00 for annual support to the D.G.R.G.

**BRIEF DESCRIPTION OF THE PERFORMANCE OF THE DGRH IN THE DESIGN
AND THE CONSTRUCTION OF IRRIGATION SYSTEMS 1/**

The Direction General of Hydraulic Resources is the entity in charge of the promotion, use and conservation of the hydraulic resources of the country. It is a dependency of the Ministry of Natural Resources and it is divided into 9 technical departments and 11 regional offices throughout the country. It counts with 154 professionals and technicians, 581 support officials, and equipment for the construction of irrigation systems. Therefore it is highly qualified to execute such work. Among the professionals are irrigation and civil engineers, agricultural engineers, economists and legal advisers. The technicians are topographers and construction assistants. This allows that all the requirements for the construction of irrigation systems and their implementation be covered.

The DGRH stated that during 1988 it constructed 8 projects of 3,500 hectares and that it supervised 23 projects of 1,700 hectares. At present, it has under way 40 projects for which no financing was yet obtained. The DGRH operated the hydro-meteorological system through the Department of Hydrology and Climatology, furnished climatic and hydrological information to the entire country. The activities of the DGRH are detailed on the attached table.

Through the Center of Education of Rural Development (CEDA), the DGRH conducted a series of courses for farmers and technicians on the subjects of crop production with irrigation, irrigation methods and designs of hydraulic works; through its legal department it processed water permits for interested farmers.

1/ Source: Annual Report of the DGRH. The information contained in the report was not ascertained in the field by the evaluation team.

DGRH ACTIVITIES IN 1988

	Quantity	Projects	Extension	Farmers
DEPARTMENT AND PROGRAMS	Un	Un	Ha.	
<u>Program for small farmers (FAO)</u>				
Rehabilitation		3	300	
Constructed		5	252	
Organization of cooperative				237
Credits: approved		5	252	
granted		8		
<u>Rehabilitation of Irrigation Districts</u>				
With assistance from Japan:				
improved			1,680	1,900
new			1,192	
<u>Department of Irrigation and Drainage</u>				
Design		9	250	
Studies		9	855	
Supervision		5	252	
		1	300	
<u>Department of Operation and</u>				
<u>Maintenance</u>				
Talks	4			63
Trips	3			64
Demonstrative plot			0.5	
Visits	151	21	3,534	
<u>Department of Hydrology & Climatology</u>				
Stations	176			
Agroclimatic studies	6			
Monthly bulletins	132			

SOURCE: Annual Report of the DGRH

**ANALYSIS OF THE CREDIT LINE OPERATIONS
OF THE D.G.R.H. WITH BANADESA**

To : Lic. Rafael Diez
PRORIEGO Appraiser

From : Ing. Enrique A. Castellón
Credit Advisor

Subject: Information on the situation of the trust administered by BANADESA for the Direction of Hydraulic Resources, whose funds are intended for irrigation projects.

Date : June 16, 1989

Hereafter I would like to inform you about the aspects, which I consider of relevance, of my meeting with the official representatives of BANADESA.

- a) On May 22, 1985 was signed the Trust Agreement between the Treasury Department and the Banco Nacional de Desarrollo Agrícola (BANADESA), with the first named in the capacity of trustor and the latter in the capacity of trustee.
- b) BANADESA administers the trust and the Direction of Hydraulic Resources approves the loans through a credit committee.
- c) These funds are intended to finance small irrigation projects and working capital.
- d) No rediscount operations are conducted in this line with the Banco Central de Honduras and collections are made directly from the beneficiary. The fixed rate of 11% is distributed as follows:
 - 3% To cover the expenses incurred by BANADESA for the administration of the trust.
 - 2% For the setting up of a reserve for uncollectible accounts (its application has to be authorized by the Treasury Department).
 - 3% To increase the fund and to provide it with capital and to grant new financings.
 - 3% For the service debt with AID.
- e) The loan periods are: short-term - 18 months; medium-term - 5 to 7 years, and long-term - from 7 to 15 or 20 years.

- f) The initial contribution to the fund was of 2 million Lempiras.
- g) The first loan was granted on May 15, 1986.
- h) On March 31 of this year, the portfolio was in the amount of L. 1,597,590.47 and on April 30, it was of L. 1,597,400.00. It is of interest to note that no loan was placed in the first year and that it was not until the second year that it was possible to place a few loans and that as of the third year on, it was possible to strengthen the portfolio as follows:

<u>End of the year</u>	<u>Loans placed</u>
1986	L. 359,500.00
1987	L. 1,192,300.00
1988	L. 1,588,400.00
1989 (until April 30)	L. 1,597,400.00

- i) In 1988, the amounts in default were of L. 201,200.00 (12.67%) and as of March 30, 1989, they were of L. 168,600.00 (10.23%), mainly caused by the collections of funds for short-term working capital.
- j) On this date, the capital and net worth of the trust is of L. 2,481,500.00, represented as follows:

Initial contribution	L. 2,000,000.00
Increase	L. 20,800.00
Contributions through earnings	L. 460,700.00
Net Worth	L. 2,481,500.00

- k) On April 30 of this year, the trust company has still available L. 707,400.00 to be placed.

Hereto attached please find for your reference the last report of the loan portfolio of the trust company, which will give you a better idea about the details of the individual loans granted.

Trusting that this information will answer your inquiry, I am

Very truly yours

NATIONAL BANK FOR AGRICULTURAL DEVELOPMENT

GENERAL ACCOUNTING DEPARTMENT

REPORT OF THE LOAN PORTFOLIO OF THE TRUST FUND

"HYDRAULIC RESOURCES"

AS OF MARCH 31, 1989

No. of loan	Sub-No. loan	Name of borrower	Amount granted	Date granted	Date due	Disbursed amount	Amount repaid	Current balance	Balance in arrears	Interests to collect
MUNICIPIO DE COMAYAGUA										
75	008	Liga Campesina Fátima	26.153.24	8- 4-88	28- 2-89	15.939.25	3.433.15	12.506.10	12.506.10	-
75	009	" " "	103.334.84	8- 4-88	28- 2-90	103.000.00	-	103.000.00	-	-
771	005	G. Campesino Agalteca Ltda.N.Palmer	146.825.41	11- 8-87	30- 4-88	61.821.90	47.308.33	14.513.57	14.513.57	-
771	006	" " " " " "	160.015.43	11- 8-87	30-12-89	160.015.43	18.317.01	141.698.42	-	-
			436.328.92			340.776.58	69.058.49	271.718.09	27.019.67	27.818.75
MUNICIPIO DE CHOLUTECA										
469	021	Liga Campesina El Limón de La Cerca	6.000.00	16- 1-87	30-12-92	-	-	-	-	-
489	022	" " " "	53.523.00	16- 1-87	30-12-96	36.080.20	-	36.080.20	-	-
593	030	Sub-Seccional	34.647.00	16- 1-87	30-12-96	25.378.18	-	25.378.18	-	-
593	0031	" " ANACH	27.100.00	13- 1-88	30- 3-88	23.258.49	14.955.71	8.302.78	8.302.78	-
593	032	" " San Rafael de Las Basas	24.604.41	1-10-87	30- 8-89	24.604.41	-	24.604.41	-	-
358	016	Coop. Agrop. El Brasil Limitada	41.177.00	21- 1-87	30- 6-87	40.620.35	25.781.30	14.839.05	14.839.05	-
358	021	" " " "	19.425.00	15- 1-88	30- 6-90	18.612.39	-	18.612.39	-	-
330	011	Pre-Coop. Eduardo Trochez	18.314.00	29- 1-87	30- 6-87	12.268.90	625.71	11.643.19	11.643.19	-
330	012	" " " "	43.285.00	29- 1-87	30-12-97	23.979.23	-	23.979.23	-	-
			268.075.41			204.802.15	41,162.72	163.439.43	34.785.02	12.555.86
MUNICIPIO DE NACAOME										
743	029	Cooperativa Agrop. La Cofaicita	74.318.16	12-11-86	30-10-96	60.118.46	-	60.118.46	-	-
743	031	" " " "	15.390.86	2-12-87	28- 2-88	15.390.86	10.263.87	5.126.99	5.126.99	-
743	032	" " " "	16.114.00	1- 6-88	30- 7-88	6.726.39	6.726.39	-	-	1.
743	033	" " " "	74.235.00	10-10-88	30- 3-89	66,779.97	66,779.97	-	-	-
743	034	" " " "	49.681.00	10- 2-89	30- 4-89	32,944.00	-	32,944.00	-	-
208	011	Asentamiento Campesino el Jobo	10.074.00	17-11-86	28- 2-87	10.074.00	-	10.074.00	10.074.00	-
208	012	" " " "	20.427.00	17-11-86	30-10-96	20.427.00	-	20.427.00	-	-
208	013	" " " "	12.904.50	15-12-87	30- 5-88	11.837.00	891.93	10.945.07	10.945.07	-
			273.144.52			224.297.68	84.662.16	139.635.52	26.146.06	16.788.64 2.

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"HYDRAULIC RESOURCES"

REPORT OF THE LOAN PORTFOLIO OF THE TRUST FUND

AS OF MARCH 31, 1989

No. of Loan	Sub-No. Loan	Name of Borrower	Amount granted	Date granted	Date due	Disbursed amount	Amount repaid	Current balance	Balance in arrears	Interests to collect	Int. coll.
AGENCIA EL PROGRESO											
1429	021	Cooperativa Agropecuaria 20 de marzo	391.850.00	16- 6-86	30- 4-96	391.850.00	-	391.850.00	-	20.443.10	
			<u>391.850.00</u>			<u>391.850.00</u>		<u>391.850.00</u>		<u>20.443.10</u>	
AGENCIA LA CEIBA											
3270	002	Emp. Asoc. Ruth Mayorquin	135.000.00	12- 6-87	30- 9-97	135.000.00	-	135.000.00	-	-	
3270	003	"	93.638.70	20- 8-88	30- 7-89	25.546.68	-	25.546.68	-	-	
3270	004	"	10.000.00	8-12-88	30- 4-90	5.280.52	-	5.280.52	-	-	
			<u>238.638.70</u>			<u>165.827.20</u>		<u>165,827.20</u>		<u>12.635.85</u>	
SAN PEDRO SULA											
6233	004	Cooperativa Agrop. 20 de Septiembre	53.060.00	23- 7-87	30- 1-88	33.011.50	10.136.08	22.875.42	22,875.42	-	
6233	005	"	90.786.50	23- 7-87	30- 6-97	90.000.00	-	90.000.00	-	-	
7127	001	Emp. Asociativa 15 de Septiembre	11.800.00	9- 6-88	30- 1-89	11.800.00	-	11.800.00	11.800.00	-	
7127	002	"	19.200.00	9- 6-88	30- 7-96	19.200.00	-	19.200.00	-	-	
			<u>174.846.50</u>			<u>154.011.50</u>	<u>10.136.08</u>	<u>143.875.42</u>	<u>34.675.42</u>	<u>6.746.06</u>	
TALANGA											
329	015	Coop. Serv. Múltiples Agalteca Ltda.	79.358.19	14- 8-87	30- 4-88	79,358.19	19,597.01	59,761.18	-	-	
329	016	"	11.554.79	14- 8-87	30- 4-90	3,115.00	-	3,115.00	3,115.00	-	
329	017	"	26.974.84	30- 4-87	30- 4-88	17,237.06	4,689.23	12,547.83	12,547.83	-	
329	019	"	20.819.17	14- 8-87	30- 4-88	3,414.52	1,789.39	1,625.13	1,525.13	-	
329	020	"	23.960.97	14- 8-87	30- 4-88	12,271.86	1,530.28	10,741.58	10,741.58	-	
604	001	Grupo Campesino San Geronino	98.877.00	15- 7-87	30- 6-97	98.877.00	-	98,877.00	-	-	
604	002	"	34.399.00	15- 7-87	30- 5-95	-	-	-	-	-	
604	003	"	4.652.00	15- 7-87	30- 6-92	-	-	-	-	-	
604	009	"	7.200.00	16- 6-88	30- 6-97	7.099.11	-	7,099.11	-	-	
604	010	"	39.841.00	13- 2-89	30- 6-97	16.181.00	-	16,181.00	-	-	
822	001	Coop. Servicios San Cayetano	67.328.00	11-12-87	30-11-97	67,303.00	-	67,303.00	-	-	
822	002	"	12.943.00	11-12-87	30-11-95	-	-	-	-	-	
822	003	"	8.876.00	11-12-87	30-11-92	-	-	-	-	-	
822	004	"	28.574.00	11-12-87	30-11-88	7.084.00	6,318.31	765.59	.765.69	-	4
822	005	"	10.640.00	11-12-87	30-11-88	5,455.00	3,823.63	1,631.39	1,631.39	-	17
822	007	"	24.395.00	11-12-87	30-11-88	8.596.90	-	8,596.90	8,596.90	-	
822	008	"	15.600.00	13- 8-88	30-11-97	15.000.00	-	15,000.00	-	-	
			<u>515.992.96</u>			<u>340.892.64</u>	<u>37,747.83</u>	<u>303,244.87</u>	<u>39,023.52</u>	<u>26.732.94</u>	
TOTAL			<u>2.298.877.01</u>			<u>1.822.557.25</u>	<u>242.967.28</u>	<u>1.579.590.47</u>	<u>161.649.69</u>	<u>126.211.95</u>	<u>5.</u>

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ANALYSIS OF THE DELIVERY TERMS FOR THE
EQUIPMENT REQUESTED FROM AID

Type of equipment	Date of request by PRORIEGO	Date of approval by AID	Date of reception of equipment by PRORIEGO	Time of delivery (in mos.)	OBSERVATIONS
16 vehicles 12 motorcycles	April 87	Sept. 30 87	June 15/88 Oct. 20/88 Dec. 15/88	14 18 20	7 vehicles and 12 motorcycles were received in June 88, and 9 other vehicles arrived in 2 shipments, starting in June 1988.
4 vehicles	June 8/87	June 30 1987	Sept. 15 1987	3	Urgent procurement. The Project had them available on Oct. 15, 1987
Photographic equipment	+April/May 87	August 24/87	April 28 1988	12	Equipment started to arrive in shipments as of the day indicated (+) without confirmation.
Office equipment	+April/May	August 24/87	April 21 1988	12	Equipment started to arrive in shipments as of the day indicated (+) without confirmation.
3 vehicles	February 1989	n.d	May 01 1989	3	The vehicles were already in the country when PRORIEGO requested them.
Computer equipment	August 25 1988	Oct. 11 1988	March 30 1989	3	The equipment was received in 2 shipments as of this date.
Office equipment	August 1988	Oct. 11 1988	April 29 1989	9	The equipment has been arriving little by little as of this date.
Field equipment	August 25 1988	Oct. 11 1988	April 29 1989	9	The equipment has been arriving as of this date.
Spare parts for vehicles	August 04 1988	Oct. 11 1988	May 01 1989	10	The spare parts started to arrive on this date.

BRIEF DESCRIPTION OF THE BANKS VISITED

FIA (FINANCIERA INDUSTRIAL Y AGROPECUARIA)

FIA is a private enterprise that is dedicated to meet the needs for financial and technical assistance of the small and medium-sized Honduran employers for increased production and employment. FIA has participated in loan operations in the agricultural sector, using resources of the AID Project No. 522-0205. In 1988/89, it placed approximately US\$125,000 of these resources in agriculture, financing the production of bananas, coffee and dairy cattle. FIA has a portfolio of roughly US\$6.0 million, of which 15% is agricultural. FIA has a staff of 12 people, of which 7 are technicians and 5 are in administrative positions.

Until May 31, 1989, FIA had made one loan in Comayagua with resources of the Project and it was actively considering other loan applications from subprojects of the Project. FIA deems that within the current conditions of the Project's credit system it could annually place approximately US\$750,000 in loans for micro-irrigation subprojects.

FICENSA (FINANCIERA CENTROAMERICANA S.A.)

Its main objective is the promotion of agricultural and industrial activities, directed toward the production of bananas, plantains, sugar cane, meat, cacao, fruits, vegetables, ornamental plants, tobacco, and seafood. It actively participates in the financing of the marketing and export of coffee. It has assets of US\$104.5 million and its loan portfolio is of US\$60 million, of which US\$28.5 correspond to the agricultural portfolio.

At present it has 13 branch offices at a national level, 7 in San Pedro Sula, 5 in Tegucigalpa and 1 in Yoro. It has 7 specialists in agricultural loans analysis.

FICENSA has been one of the first banks that joined the system; however, its response has not yet been very positive in the city of Tegucigalpa, due to that the staff of the Agricultural Department is rather conservative. Until now, it has placed 1 loan in San Pedro Sula.

BANCO SOGERIN. S.A.

It was established in 1969, under the name of Banco Hipotecario S.A., with the primary objective to finance housing. In 1977, it changed its name to Banco Sogerin, S.A.

It has 32 offices located as follows: 6 in Tegucigalpa, 1 in Tocoa, 1 in Juticalpa, 1 in Catamarca, 1 in French Harbor, 1 in Roatán, 8 in San Pedro Sula, 2 in La Ceiba, 1 in Marcala, La Paz,

1 in Progreso, 1 in Comayagua, 1 in Siguatepeque, 1 in Choluteca, 1 in Copán, 1 in Santa Bárbara, 1 in Morazán, 1 in Danlí, 1 in La Entrada, and 1 in La Flecha.

Its loan portfolio is of US\$97.5 million of which US\$13.0 million correspond to the agricultural portfolio.

During the last few years, SOGERIN has backed the financing of export products, such as bananas, cacao and vegetables, mainly in the zone of Comayagua. The bank has 8 loan offices; 5 in San Pedro Sula, 1 in Copán and 2 in Tegucigalpa.

Until now, the BANCO SOGERIN S.A. has responded very well to the Project, having placed 1 loan in San Pedro Sula.

BANCO CONTINENTAL

This bank was established in 1974, with the purpose of conducting regular banking operations. Its loan portfolio is of US\$70 million, of which 30%, that is to say, US\$21 million, corresponds to the agricultural portfolio.

It has 7 specialists in agricultural loans analyses, all of whom are located in San Pedro Sula. It currently has 5 branch offices, of which 2 are located in San Pedro Sula, 1 in Danlí and 2 in Tegucigalpa.

The Banco Continental, S.A. has shown much interest in the credit line of the Project. The bank is directing its policy more to industrial agriculture than to business or to the manufacturing industry. The short-term plans of this bank are directed toward the financing of agricultural projects.

A few days ago, the Board of Directors declared eligible for financing the first five projects and it is hoped that they will be financed with funds of the Project. From this bank is expected an active participation in the credit line of the Project.

BANCO DE LOS TRABAJADORES

This bank was established in 1967, with the object of making loans to the working class and rural sector, and to conduct regular banking operations. Its loan portfolio is of US\$72.2 million and the agricultural portfolio is of US\$13.0 million.

It currently has 7 specialists in agricultural loans analyses (agricultural engineers and licentiates in agriculture), located in the following regions: 2 in Comayagua, 3 in San Pedro Sula, 2 in Tegucigalpa. One will be appointed in Danlí in the month of July, which will bring the total to 8.

It has 10 branch offices, located as follows: 2 in San Pedro Sula, 1 in La Ceiba, 1 in Cortés, 1 in Juticalpa, 1 in Danlí, and 4 in Tegucigalpa.

The Banco de los Trabajadores has shown manifest interest in the credit line of PRORIEGO. It was the bank which placed the first loan of PRORIEGO and it is pays attention to invest the funds of the credit line.

BANHCAFE (BANCO HONDUREÑO DEL CAFE)

It was established in 1981, with the purpose of financing the production, marketing and export of coffee.

Its loan portfolio is of US\$27.5 million, of which US\$2.5 million correspond to the agricultural portfolio. It currently has 7 specialists in agricultural loans analyses: 7 in San Pedro Sula, 8 in Comayagua, Fco. Morazán and the Mid-Eastern Zone; and 3 in other zones.

BANHCAFE has recently joined the credit system of the Project. Given its organizational structure and agricultural outlook, it is deemed that it will be one of the main banks with which PRORIEGO will be able to reach the small agricultural producers.

BANCO DE COMERCIO, S.A.

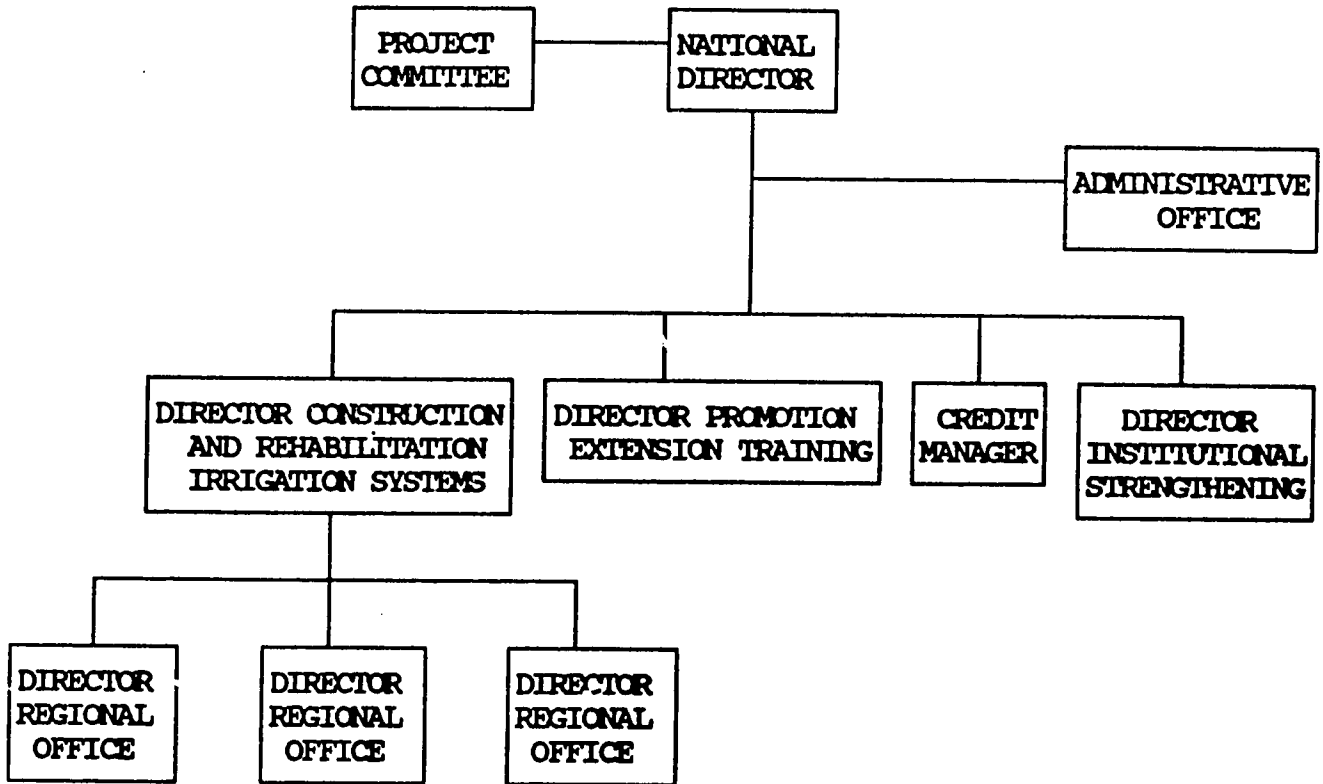
It was established in 1968, with the object of promoting commerce and industry. Its loan portfolio is of US\$58.5 million, of which US\$5.0 million correspond to its agricultural portfolio.

It has 2 specialists in agricultural loans analyses, located in the city of San Pedro Sula.

The Banco de Comercio has 8 branch offices, located: 2 in Tegucigalpa, 2 in San Pedro Sula, 1 in Choluteca, 1 in Progreso, 1 in La Ceiba, and 1 in Puerto Cortés.

This bank has recently joined the credit system of the Project and it has shown much interest in participating in the financing of irrigation activities.

STRUCTURE OF THE CURRENT ORGANIZATION
OF THE PROJECT



ANALYSIS OF ALTERNATIVES TO DETERMINE THE
ADVISABILITY OF SHUTTING DOWN OR CONTINUING THE PROJECT

ALTERNATIVE I. SHUTTING DOWN THE PROJECT

This analysis was studied, taking into account the negative and positive arguments that could benefit or not the taking of the decision of shutting down the Project, three years after the start of its implementation and four years prior to its conclusion.

NEGATIVE ARGUMENTS THAT COULD SUPPORT THE DECISION TO SHUT DOWN THE PROJECT

The arguments that could support the decision to shut down the Project are as follows:

- The negative differences between the projected results and the ones actually obtained during three years of implementation are too great.
- The possibilities that exist to reach the objectives and goals projected in the original design for the 7 years are very low in the still remaining 4 years.
- The uncertainty created by the election year and the political change could delay even more the achievements of the Project.
- The Project would have to count with a new Foreign Assistance team, which could create countless implications of procedure, cost and financing, all of which could delay even more the execution of the Project.
- The need the Project would have to be able to count with a considerable, additional budget in order to reach the objectives and goals contemplated in the original design.
- The considerable expenditure already incurred for the extremely low success recorded until now.

POSITIVE ARGUMENTS THAT COULD BE AGAINST THE SHUTTING DOWN OF THE PROJECT

The positive arguments that could be against the decision to shut down the Project are as follows:

- Honduras has to raise its rather lagging agricultural production. Among others, it requires irrigation in order to achieve this. The strategy by AID/Honduras for the agricultural sector considers this and recommends the carrying out of irrigation operations.

- The Project has already overcome its most difficult phase. It has been implemented and started to operate in an organized manner, obtaining some favorable results with irrigation, such as double crops and the substitution of the traditional crops with exportable crops.
- The Project was successful in interesting the private banks to participate in the credit system of the Project, a task which certainly was not an easy one.
- The Project has already spent or committed about 23% of its budget in the installation of the infrastructure, equipment and other durable goods, technical assistance, etc., which would be lost in case the Project would be shut down. The analyses of economic and financial yields, conducted for the Alternative IV, show that the already incurred costs (irrecoverable costs or "sunk costs") could be beneficial, instead of being lost, if the Project would continue with changes to its original design.
- The officials and the local personnel have already identified themselves with the objectives of the Project and, therefore, have started to assume their executory responsibilities.
- The credit funds of the Project have already started to be mobilized for their purposes after a long delay caused by a protracted and complicated start-up process.
- The Project has already invested considerable sums in the training and preparing of professionals, technicians, administrative personnel and producers without having obtained as of yet the expected benefits.

CONCLUSION

Analyzing the impact of the pros and cons of the arguments, the conclusion was reached that this Alternative should be discarded. The Project is the first one of its type to be carried out in Honduras and it was therefore reasonable to expect to happen what happened. On the other hand, the necessity to feed the Honduran people which, in the opinion of the strategy of AID/Honduras for the agricultural sector, is at the nutritional levels of the 70's, is too important to deny the country the support of the Project.

**ALTERNATIVE II. CONTINUATION OF THE PROJECT IN ITS CURRENT FORM,
WITHIN THE STRUCTURE OF THE ORIGINAL DESIGN**

This Alternative was analyzed in function (a) of the magnitude of work that the Project would have to conduct in 4 years to reach its objectives and goals projected in its original design for a period of 7 years, from 1986 to 1993; (b) of the supplementary estimates this effort would require, and (c) of the technical and operational capability the Project would have to have to carry out this work. The results of the analysis are as follows:

IN FUNCTION OF THE MAGNITUDE OF THE WORK THE PROJECT WOULD HAVE TO CONDUCT

The below table gives an idea of the magnitude of work the Project would have to carry out in order to fully achieve the objectives and goals projected in its original design.

Objectives and goals projected, attained and
to be attained by the Project

(Period 1986 - 1993)

OBJECTIVES	PROJECTED GOALS (1986-1993)	ATTAINED GOALS (AS OF 5/31/89)	OBJECTIVES TO BE ATTAINED UNTIL 1993
AIM			
No. of families to benefit	3,000	31	2,969
GOAL			
Surface to irrigate (ha)	6,627	26	6,601
Production (m/t)	90,349	268	90,081
Productivity (m/t/ha)	10.6	7.9	2.7
PRODUCTS			
Irrigation systems to be constructed	604	4	600
Micro-irrigation	424	0	424
Small-scale irrigation	121	4	117
Medium-scale irrigation	39	0	39
Drainage	20	0	20
Loans to be approved (in US\$ millions)	15	0.2	14.8
Investment Equipment or working capital	10 5	0.2 0.12	9.92 4.88

Source: Project Document; Loan and Grant Agreement and Results obtained from the evaluation.

The goals to be achieved shown in the table represent the amount of work the Project would have to carry out during the still remaining 4 years of execution. This means that it would have to:

- Benefit 742 families each year with increases of the agricultural income.
- Irrigate 1,650 hectares per year.
- Produce 22,520 m/t of agricultural crops per year with irrigation in the carried out subprojects.
- Increase 8% per year the overall productivity with irrigation.
- Construct 150 irrigation systems per year, of which, in accordance with the Agreement, 71% are or micro-irrigation, 20% of small-scale irrigation, 7% of medium-scale irrigation, and 3% of drainage.
- Obtain the approval for US\$3.7 million per year in loans, 67% of which is for investment and 33% for equipment.

IN FUNCTION OF THE TECHNICAL AND OPERATIONAL CAPABILITY WHICH THE PROJECT WOULD HAVE TO HAVE TO CARRY OUT THIS WORK

The abovementioned goals to be achieved mean that the Project, with the technical and operational capability it has shown in the execution in the 1989 Work Program, would have to prepare 4 times as many feasibility studies; to carry out 7.5 to 15 times as many irrigation subprojects; to irrigate 5.5 to 11 times as much surface area; to benefit 7.4 to 15 times as many beneficiaries; and to approve 3 to 7.4 times as many loans, as it is currently doing each year. (These ratios were estimated by comparing the goals to be attained with the results obtained and to be achieved until the end of 1989, expressed in degrees.)

To make this effort means that the Project would have to increase to a great extent its technical and operational capability, for which it would have no alternative but to considerably increase its staff of professional, technical and administrative personnel, to permanently keep the technical assistance by AGROTECNIA, to open the Project to the participation by the private sector, or to adopt a combination of all of these factors. (it is estimated that if the option to increase the professional and technical staff is adopted, it would have to be increased from the current 63 people, including the AGROTECNIA personnel, to roughly 236 people if the same technical-operational capability, shown in the execution of the 1989 Work Program, is maintained.

IN FUNCTION OF THE BUDGET THAT WOULD BE NECESSARY TO FINANCE THIS WORK

To calculate the required budget to attain the projected aims and goals of the Project it was necessary to take into account the following considerations and hypotheses:

- It was assumed that to execute 150 subprojects each year, the Project would have to prepare approximately 225 annual feasibility studies, in view of a possible rejection ratio

of 33% by part of the banks or because of other circumstances.

- It was assumed that to execute 150 subprojects every year, the Project would have to operate at the national level. Notwithstanding the fact that this would require a considerable quantitative and qualitative modification of the current staff of the personnel of the Project, for the purpose of the analysis of this Alternative it was assumed that it would operate with 10% less of support personnel and with 100% more of government professionals and technicians than it has at present. That is to say, that in the first case 70 people would have to be better trained and, in the second case, 76 qualified individuals. The increase of professional and technical personnel would be absolutely necessary to be able to expand the operations of the Project to a national level, such as it was projected in the original design, and to be able to cover the lack of the professional and technical personnel of AGROTECNIA, once this company terminates its technical assistance contract with the Project.
- It was assumed that the Project would do without the technical assistance services of AGROTECNIA at the end of its contract in June 1990, and that it would start to operate with consultants from the private sector, who would be furnished guidelines and methodologies for the drafting of the studies and the supervision of the work, and an endorsement to guarantee the correctness of their work, which it would give subsequent to reviewing the studies, prior to submitting them to the commercial banks for financing.
- It was assumed that the consultants of the private sector would be directly contracted by the clients, who would pay them for their services with funds from the obtained investment credit. The evaluation team deems that, if it is the intention to develop the private consulting sector, the private consultants should not be contracted by the Project but rather by the clients. Also, the Project should not pay for the services of the consultants but rather the clients with a percentage that is included in the obtained investment credit. The private consulting sector should be skillfully managed in order to obtain clients and to respond to them and the commercial banks.
- It was assumed that the Project would not only operate with "credit[worthy] subjects" of the commercial banks, as it has been doing until now, but also with small producers of scarce resources, for which it would have to adapt its technical staffs or delegate these responsibilities to the DGRH, as it was originally set forth in the Project Document and in the Loan and Grant Agreement.
- It was assumed that the credit requirements would reach US\$2,700/ha for investment and US\$2,333/ha for agricultural equipment or working capital. These figures were obtained from an analysis of the investment and production costs of a series

of 33% by part of the banks or because of other circumstances.

- It was assumed that to execute 150 subprojects every year, the Project would have to operate at the national level. Notwithstanding the fact that this would require a considerable quantitative and qualitative modification of the current staff of the personnel of the Project, for the purpose of the analysis of this Alternative it was assumed that it would operate with 10% less of support personnel and with 100% more of government professionals and technicians than it has at present. That is to say, that in the first case 70 people would have to be better trained and, in the second case, 76 qualified individuals. The increase of professional and technical personnel would be absolutely necessary to be able to expand the operations of the Project to a national level, such as it was projected in the original design, and to be able to cover the lack of the professional and technical personnel of AGROTECNIA, once this company terminates its technical assistance contract with the Project.
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- It was assumed that the credit requirements would reach US\$2,700/ha for investment and US\$2,333/ha for agricultural equipment o working capital. These figures were obtained from an analysis of the investment and production costs of a series

of feasibility studies prepared for the Project. The amount of the investment credit includes a 5% of the cost per hectare, which would be allocated for the payment of the consulting services. This percentage is standard for Latin American consultants to prepare feasibility studies of subprojects of the type required by the Project.

In view of these considerations and hypotheses, the estimated budget that would be necessary to attain the aims and goals projected in the original design reaches US\$48.1 million, of which US\$40.0 million would be for investment and US\$8.1 million for operations. The total cost added to the US\$7.6 million that have already been spent or committed until May 1989, results in a total of US\$55.7 million.

CONCLUSION

The analysis of this Alternative taking into account the three mentioned factors shows that it is not an acceptable Alternative, even in the case that a profitability analysis would show that it is economically and financially feasible. On one hand, the Project could not set up nor manage a technical and operational capability sufficiently efficient to achieve the aims and goals projected in the original design which, from another point of view, were too ambitious. On the other hand, the supplementary budget that would be necessary, such as it been estimated in a conservative manner, is of such magnitude that it would not have any possibility to be approved by AID or by the Government of Honduras. It is deemed that an analysis of economic or financial profitability of this Alternative under these conditions of technical, operational and budgetary impossibility would constitute a theoretical exercise that should not be made.

In view of these considerations, it is deduced that this Alternative is not feasible and that, therefore, it has to be discarded.

DETAILS OF THE INVESTMENT AND OPERATIONAL COSTS
CALCULATED FOR ALTERNATIVE II.

<u>INVESTMENTS</u>		<u>US\$</u>
Credit		<u>33,439,252</u>
Investment credit	17,938,800	
(604 subprojects x 11 ha x US\$2,700/ha)		
Equipment credit PRORIEGO subprojects	15,500,452	
(604 subprojects x 11 ha x US\$2,333 ha)		
Equipment		<u>250,000</u>
20 typewriters x US\$1,500 each	30,000	
5 vehicles x US\$20,000 each	100,000	
10 motorcycles x US\$2,000 each	20,000	
Other equipment	100,000	
Foreign Technical Assistance		<u>1,800,000</u>
120 persons/month x US\$15,000/month	1,800,000	
Domestic Technical Assistance		<u>1,560,000</u>
15 persons/month x US\$4,000/month	60,000	
AGROTECNIA: 25 professionals & technicians		
x US\$2,000/month x 12 months	600,000	
26 support personnel x US\$700/month		
x 12 months	218,400	
Travel expenses and overhead 83%	681,600	
Training		<u>885,600</u>
180 professionals x 8 sessions		
x 5 days each x \$30/day	216,000	
228 technicians x 8 sessions		
x 5 days each x \$30/day	273,600	
3,300 farmers x 8 sessions x 3 days		
each x \$5/day	396,000	
Evaluation and audit		<u>160,000</u>
2 evaluations x US\$80,000 each	160,000	
Contingencies		<u>1,904,473</u>
5% of total investment	1,904,743	
TOTAL INVESTMENT:		<u><u>39,999,595</u></u>

<u>OPERATION</u>	<u>US\$</u>
Salaries	<u>5,328,000</u>
38 prof. & technicians X US\$1,000 x 12 months x 4 years x 2 times	3,648,000
70 support x US\$500 x 12 months x 4 years	1,680,000
Materials and supplies	<u>512,000</u>
PRORIEGO spent US\$192,000 in 3 years US\$192,000 ÷ 3 x 4 years	512,000
Fuel	<u>588,800</u>
32 vehicles x 30,000 km/year x 32 km/gal x US\$2/gal x 4 years x 2 times	480,000
20 motorcycles x 10,000 km/year x 100 km/gal x US\$2/gal x 4 years x 2 times	32,000
Lubricants: 15% x US\$512,000	76,8000
Operating expenses	<u>1,056,000</u>
Electricity (TGU: US\$200/month Regions: US\$200/month each x 3 x 12 x 4 years)	34,800
Telephone (TGU: US\$400/month Regions: US\$400/month each x 3 x 12 x 4 years)	76,800
Rent (TGU: US\$2,000/month Regions: US\$2,000/month each x 3 x 12 x 4 years)	384,000
Vehicles insurance: 32 vehicles x US\$469/veh/year x 4 years	60,000
Repairs of copiers: 15% of their cost US\$40,000/year x 4 years	24,000
Repairs of typewriters: 15% of their cost US\$60,000/year x 4 years	36,000
Repairs of vehicles: 15% of their cost 1 year x 4 years	384,000
Repairs of computers: 15% of their cost US\$48,000/year x 4 years	28,800
Copiers: 10,000 copies/month x US\$0.05 x 12 x 4 years	24,000
TOTAL OPERATION:	<u>8,123,200</u>
TOTAL INVESTMENT AND OPERATION	<u>48,122,795</u>

140.

ALTERNATIVE III. CONTINUE THE PROJECT MAKING ADJUSTMENTS TO THE ORIGINAL DESIGN, INCORPORATING THE DGRH INTO THE PREPARATION OF FEASIBILITY STUDIES AND EXECUTION OF MICRO-IRRIGATION SUBPROJECTS, MAINTAINING THE CURRENT TECHNICAL-OPERATIONAL CAPABILITY OF THE PROJECT AND SUBSTITUTING THE AGROTECNIA PERSONNEL AT THE END OF ITS CONTRACT IN JUNE 1990 WITH CONSULTING SERVICES OF THE PRIVATE SECTOR

This Alternative was analyzed from the points of view of its technical-operational feasibility and its financial and economic profitability. The following considerations and hypotheses were taken into account for the analysis:

- It was assumed that under this Alternative the Project would benefit 1,331 producers with increased incomes; it would irrigate 1,840 hectares (PRORIEGO 1,300 ha and the DGRH 540 ha); it would prepare 480 feasibility studies (PRORIEGO 240 and the DGRH 240); it would construct 260 irrigation systems (PRORIEGO 80 and the DGRH 180); and it would obtain the approval of US\$7.2 million of credits for the subprojectes to be executed. These estimated results are based on the technical and operational capability shown by the Project in the execution of the 1989 Work Program, including the processing of the credit facility which, due to its current slowness, is the principal limiting factor for an improvement of the obtained results.
- It was assumed that the execution of the Project under this Alternative would not require a modification of the number of professionals and technicians it has at present, but that it could allow a reduction of 10% of the support staff.
- It was assumed that the studies prepared by PRORIEGO would be for beneficiaries that qualified as "credit[worthy] subjects" by the commercial banks and that those prepared by the DGRH would be for beneficiaries of scarce economic recourses with properties of less than 5 hectares.
- It was assumed that each of the subprojects executed by PRORIEGO would have an average irrigation of 15 hectares, and that each of those executed by the DGRH would have 3 hectares. The surface area mentioned first is based on: (a) information of land holding in Honduras, which indicates that approximately 80% of the agricultural properties of the country are of less than 10 hectares (See attached information); (b) information from the Project Document that confirms it; and (c) information resulting from the analysis of the sizes of 65 subprojects prepared by the Project which showed a weighted average of 10.8 hectares per subproject.
- It was assumed that the subprojects executed by PRORIEGO would require credits of US\$2,700/ha for investment and US\$2,333/ha for agricultural equipment or working capital; and those executed by the DGRH would require US\$2,223/ha for agricultural equipment or working capital. Furthermore, the DGRH would

require an amount of US\$650,000 to finance the investments of the ... [Translator's Note: original Spanish text missing] ...

of economic return of -60.1% per annum, which indicate that the Project is financially but not economically feasible within the outlines of this Alternative.

CONCLUSION

Based on the results of the analyses it is deemed that this Alternative is feasible from the technical, operational and financial profitability points of view but that from a point of view of economic profitability it is not feasible. Therefore, it is recommended to discard it.

TABLE No. 1

CALCULATION OF THE "ECONOMIC" PROFITABILITY
OF THE PROJECT WITH ALTERNATIVE III

(In thousands of dollars)

YEAR	BENEFITS	OPERATING COSTS OF PRORIEGO	PRODUCTION COSTS FARMS	INVESTMENTS	NET BENEFITS
1-3	-	1,525	-	9,260	(10,785)
4	455	1,364	672	5,700	(7,267)
5	3,127	1,364	2,595	5,435	(6,267)
6	5,651	1,364	4,520	4,435	(4,668)
7	8,587	1,364	6,442	3,562	2,781
8	8,713	1,364	6,442	-	907
9	8,797	1,364	6,442	-	991
10	8,838	1,364	6,442	-	1,032
11	8,838	1,364	6,442	-	1,032
12	8,838	1,364	6,442	-	1,032
13	8,838	1,364	6,442	-	1,032
14	8,838	1,364	6,442	-	1,032
15	8,838	1,364	6,442	-	1,032
16	8,838	1,364	6,442	-	1,032
17	8,838	1,364	6,442	-	1,032
18	8,838	1,364	6,442	-	1,032
19	8,838	1,364	6,442	-	1,032
20	8,838	1,364	6,442	-	1,032

OBSERVATION: The costs incurred during the years 1-3 are deemed "sunk costs" or irrecoverable. The TIRE was calculated excluding these costs.

TIRE: -60.1% per annum

TABLE No. 2

CALCULATION OF THE "ECONOMIC" BENEFITS OF THE PROJECT
WITH ALTERNATIVE III

(In thousands of dollars)

YEAR	VALUE OF THE INCREASED PRODUCTION 1/	VALUE OF THE EXPORTABLE PRODUCTION 2/	ECONOMIC VALUE OF THE EXPORTABLE PRODUCTION 3/	ECONOMIC BENEFITS 4/
1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	370	122	207	455
5	2,540	838	1,425	3,127
6	4,591	1,515	2,575	5,651
7	6,976	2,302	3,913	8,587
8	7,078	2,336	3,971	8,713
9	7,146	2,358	4,009	8,797
10	7,180	2,369	4,027	8,838
11	7,180	2,369	4,027	8,838
12	7,180	2,369	4,027	8,838
13	7,180	2,369	4,027	8,838
14	7,180	2,369	4,027	8,838
15	7,180	2,369	4,027	8,838
16	7,180	2,369	4,027	8,838
17	7,180	2,369	4,027	8,838
18	7,180	2,369	4,027	8,838
19	7,180	2,369	4,027	8,838
20	7,180	2,369	4,027	8,838

1/ Brought forward from Table 6

2/ The 33% of the production corresponds to melons and fruits that are exportable crops.

3/ A shadow price of the foreign currency of 1.7 is used to convert the value of exportable production (Column 2) to its economic value (Column 3).

4/ Column 2 less Column 3 plus Column 4.

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TABLE No. 3

"ECONOMIC" INVESTMENT AND OPERATING COSTS OF THE PROJECT
WITH ALTERNATIVE III 1/

(In thousands of dollars)

ITEM	Y E A R				TOTAL
	4	5	6	7	
<u>Investment</u>					
Credit 2/	2,760	2,760	2,760	2,760	11,040
Equipment	473	420	320	318	1,531
Foreign Tech. Asst.	459	1,683	918	-	3,060
Domestic Tech.Asst.	1,560	-	-	-	1,560
Training	177	177	178	178	710
Eval. & Audit	-	136	-	136	272
Contingencies (5%)	271	259	209	170	909
Subtotal	<u>5,700</u>	<u>5,435</u>	<u>4,385</u>	<u>3,562</u>	<u>19,082</u>
<u>Operation</u>					
Salaries	876	876	876	876	3,504
Materials & Supplies	109	109	109	109	436
Fuel	102	102	102	102	407
Travel Expenses	63	63	63	62	251
Operating Expenses	214	214	214	215	857
Subtotal	<u>1,364</u>	<u>1,364</u>	<u>1,364</u>	<u>1,364</u>	<u>5,455</u>
T O T A L:	<u><u>7,064</u></u>	<u><u>6,799</u></u>	<u><u>5,749</u></u>	<u><u>4,925</u></u>	<u><u>24,537</u></u>

1/ The credit, equipment, foreign technical assistance, training, evaluation and audit, materials and supplies, and fuel values were converted to their economic values by using the shadow price of the foreign currency, estimated at 1.7.

2/ It was assumed that 75% of the credit is in foreign currency.

TABLE No. 4

ECONOMIC COSTS OF THE PRODUCTION OF THE FARMS
WITH ALTERNATIVE III

(In thousands of dollars)

YEAR	INCREASED PRODUCTION COST 1/	PRODUCTION COSTS IN FOREIGN CURRENCY 2/	"ECONOMIC" COSTS IN FOREIGN CURRENCY 3/	"ECONOMIC" PRODUCTION COSTS 4/
3	-	-	-	-
4	473	284	483	672
5	1,828	1,097	1,864	2,595
6	3,183	1,910	3,247	4,520
7	4,537	2,722	4,627	6,442
8	4,537	2,722	4,627	6,442
9	4,537	2,722	4,627	6,442
10	4,537	2,722	4,627	6,442
11	4,537	2,722	4,627	6,442
12	4,537	2,722	4,627	6,442
13	4,537	2,722	4,627	6,442
14	4,537	2,722	4,627	6,442
15	4,537	2,722	4,627	6,442
16	4,537	2,722	4,627	6,442
17	4,537	2,722	4,627	6,442
18	4,537	2,722	4,627	6,442
19	4,537	2,722	4,627	6,442
20	4,537	2,722	4,627	6,442

1/ Brought forward from Table No. 8

2/ 60% of Column 2 was considered.

3/ A shadow price of 1.7 is used for the foreign currency (Column 3 x 1.7)

4/ Is equal to Column 2 less Column 3 plus Column 4.

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TABLE No. 5

CALCULATION OF THE "FINANCIAL" PROFITABILITY
OF THE PROJECT WITH ALTERNATIVE III

(In thousands of dollars)

YEAR	INCOME <u>1/</u>	PRORIEGO OPERATING COSTS <u>2/</u>	PRODUCTION COSTS FARMS <u>3/</u>	INVESTMENTS <u>4/</u>	NET INCOME
1-3		1,344		6,267	(7,611)
4	370	1,297	473	4,223	(5,623)
5	2,540	1,277	1,828	3,393	(3,958)
6	4,591	1,276	3,183	2,775	(2,643)
7	6,976	1,276	4,537	2,391	(1,228)
8	7,078	1,276	4,537		1,265
9	7,146	1,276	4,537		1,333
10	7,180	1,276	4,537		1,367
11	7,180	1,276	4,537		1,367
12	7,180	1,276	4,537		1,367
13	7,180	1,276	4,537		1,367
14	7,180	1,276	4,537		1,367
15	7,180	1,276	4,537		1,367
16	7,180	1,276	4,537		1,367
17	7,180	1,276	4,537		1,367
18	7,180	1,276	4,537		1,367
19	7,180	1,276	4,537		1,367
20	7,180	1,276	4,537		1,367

OBSERVATION: The incurred expenses during years 1-3 were considered irrecoverable (sunk costs)

1/ Brought forward from Table No. 6

2/ Brought forward from Table No. 7

3/ Brought forward from Table No. 8

TIRF: 37.74% per annum

TABLE No. 6

PRODUCTION AND VALUE OF THE PRODUCTION OF THE PROJECT
WITH ALTERNATIVE III

(In thousands of dollars)

YEAR	PRODUCTION (M/T) 1/		VALUE (US\$ 000) 2/		
	W/IRRIG.	WITHOUT IRRIGATION	W/IRRIG.	WITHOUT IRRIG.	INCREASE
1	-	12,183	-	2,034	-
2	-	12,183	-	2,034	-
3	788	11,520	141 3/	1,924	-
4	9,018	8,640	1,813	1,443	370
5	17,422	5,760	3,502	962	2,540
6	25,233	2,860	5,072	481	4,591
7	34,709	-	6,976	-	6,976
8	35,212	-	7,078	-	7,078
9	35,551	-	7,146	-	7,146
10	35,722	-	7,180	-	7,180
11	35,722	-	7,180	-	7,180
12	35,722	-	7,180	-	7,180
13	35,722	-	7,180	-	7,180
14	35,722	-	7,180	-	7,180
15	35,722	-	7,180	-	7,180
16	35,722	-	7,180	-	7,180
17	35,722	-	7,180	-	7,180
18	35,722	-	7,180	-	7,180
19	35,722	-	7,180	-	7,180
20	35,722	-	7,180	-	7,180

1/ Brought forward from Table No. 9

2/ Calculated based on the value of the weighted yield: with irrigation:
 $\text{US\$}4,018/\text{ha} \div 20,048 \text{ kg/ha} = \text{US\$}201 \text{ m/t}$; without irrigation:
 $\text{US\$}1,102 \text{ ha} \div 6,621 \text{ kg/ha} = \text{US\$}167 \text{ m/t}$. See Table No. 13.

3/ Real value of the 1988/89 campaign.

TABLE No. 7

PRORIEGO'S INVESTMENT AND OPERATING COSTS
WITH ALTERNATIVE III

(In thousands of dollars)

ITEM	Y E A R				TOTAL
	4	5	6	7	
<u>Investment</u>					
Credit	1,810	1,810	1,810	1,810	7,240
Equipment	278	247	188	187	900
Foreign Tech. Assist.	270	990	540	-	1,800
Domestic Tech. Assist.	1,560	-	-	-	1,560
Training	104	104	105	105	418
Evaluation & Audit	-	80	-	80	160
Contingencies (5%)	201	162	132	109	604
Subtotal	4,223	3,393	2,775	2,291	12,682
<u>Operation</u>					
Salaries	876	876	876	876	3,504
Materials & Supplies	64	64	64	64	256
Fuel	60	60	60	60	240
Travel Expenses	63	63	63	62	251
Operating Expenses	214	214	214	215	857
Subtotal	1,277	1,277	1,276	1,276	5,106
TOTAL:	<u>5,500</u>	<u>4,670</u>	<u>4,051</u>	<u>3,567</u>	<u>17,788</u>

TABLE No. 8

INCREASED PRODUCTION COSTS FOR FARMS
WITH ALTERNATIVE III

(In thousands of dollars)

YEAR	SURFACE AREA		PRODUCTION COSTS 1/		INCREASE (000 US\$)
	W/IRRIG.	WITHOUT IRRIG. (ha)	W/IRRIG.	WITHOUT IRRIG. (000 US\$)	
1	-	1,840	-	1,192	-
2	-	1,840	-	1,192	-
3	100	1,740	141 2/	1,127	-
4	535	1,305	1,319	846	473
5	970	870	2,392	564	1,828
6	1,405	435	3,465	282	3,183
7	1,840	-	4,537	-	4,537
8	1,840	-	4,537	-	4,537
9	1,840	-	4,537	-	4,537
10	1,840	-	4,537	-	4,537
11	1,840	-	4,537	-	4,537
12	1,840	-	4,537	-	4,537
13	1,840	-	4,537	-	4,537
14	1,840	-	4,537	-	4,537
15	1,840	-	4,537	-	4,537
16	1,840	-	4,537	-	4,537
17	1,840	-	4,537	-	4,537
18	1,840	-	4,537	-	4,537
19	1,840	-	4,537	-	4,537
20	1,840	-	4,537	-	4,537

1/ The production cost with irrigation is of US\$2,463/ha and without irrigation US\$648/ha. See Table No. 14.

2/ Actual value of the 1988/89 campaign.

TABLE No. 9

TOTAL PRODUCTION OF THE PROJECT
WITH ALTERNATIVE III

YEAR	SURFACE AREA 1/		PRODUCTION	
	W/IRRIG. (ha)	WITHOUT IRRIG. (ha)	W/IRRIG. 2/ (M/T)	WITHOUT IRRIG. 3/ (M/T)
1	-	1,840		12,183
2	-	1,840		12,183
3	100	1,740	788	11,520
4	535	1,305	9,018	8,640
5	970	870	17,422	5,760
6	1,405	435	25,233	2,880
7	1,840	-	34,709	-
8	1,840	-	35,212	-
9	1,840	-	35,551	-
10	1,840	-	35,722	-
11	1,840	-	35,722	-
12	1,840	-	35,722	-
13	1,840	-	35,722	-
14	1,840	-	35,722	-
15	1,840	-	35,722	-
16	1,840	-	35,722	-
17	1,840	-	35,722	-
18	1,840	-	35,722	-
19	1,840	-	35,722	-
20	1,840	-	35,722	-

- 1/ Calculated based on the pace of the incorporation of the subprojects into the Project. The 7th year shows 80 subprojects of 15 hectares each and 180 subprojects of 3 hectares each ($80 \times 15 + 180 \times 3$) = 1,740 ha + 100 hectares already irrigated = 1,840 hectares.
- 2/ Brought forward from Table No. 10.
- 3/ The production without irrigation is equal to the product of the surface area times 6,621 kg/ha, which is the weighted yield without irrigation (Source: Table No. 13)

TABLE No. 10

INCREASE OF PRODUCTION OF THE PROJECT
WITH ALTERNATIVE III

(In thousands of kilos)

IRRIGATED SURFACE (ha)	Y E A R									
	3	4	5	6	7	8	9	10	-	20
100	788 ^{1/}	800	822	838	838	838	838	838	838	838
435		8,218 ^{2/}	8,382	8,550	8,721	8,721	8,721	8,721	8,721	8,721
435			8,218	8,382	8,550	8,721	8,721	8,721	8,721	8,721
435				8,217	8,382	8,550	8,721	8,721	8,721	8,721
435					8,218	8,382	8,550	8,721	8,721	8,721
TOTAL:	780	9,018	17,422	25,233	34,709	35,212	35,551	35,722	35,722	35,722

OBSERVATION: On each line is shown the annual production on the irrigated surface.
Every year the production increases by 2% until reaching a weighted yield of 20,048 kg/ha in the 4th year, as of which it stabilizes.

1/ Actual result of the 88/89 campaign.

TABLE No. 11

ITEMIZED INVESTMENT AND OPERATING COSTS
FOR ALTERNATIVE III

<u>INVESTMENT</u>		US\$
Credit		<u>7,240,000</u>
Investment credit	3,240,000	
(80 subprojects x 15 ha x US\$2,700/ha)		
Equipment credit subprojects PRORIEGO	2,800,000	
(80 subprojects x 15 ha x US\$2,333/ha)		
Equipment credit subprojects DGRH	1,200,000	
(180 subprojects x 3 ha x US\$ 2,223/ha)		
Equipment		<u>900,000</u>
20 typewriters x US\$ 1,500 each	30,000	
5 vehicles x US\$20,000 each	100,000	
10 motorcycles x US\$2,000 each	20,000	
Irrigation equipment for DGRH	650,000	
Other equipment	100,000	
Foreign Technical Assistance		<u>1,800,000</u>
120 people/month x US\$15,000/month	1,800,000	
Domestic Technical Assistance		<u>1,560,000</u>
15 people/month X US\$4,000 month	60,000	
AGROTECNIA: 25 prof. & tech. x US\$2000/months		
x 12 months	600,000	
26 support personnel x US\$700/		
month x 12 months	218,400	
Travel expenses and overhead 83%	681,600	
Training		<u>417,600</u>
88 prof. x 8 sessions x 5 days each x \$30/day	105,600	
120 tech. x 8 sessions x 5 days each x \$30/day	144,000	
1400 farmers x 8 sessions x 3 days each		
x \$5/day	168,000	
Evaluation and audit		<u>160,000</u>
2 evaluations x US\$80,000 each	160,000	
Contingencies		<u>603,880</u>
5% of the total expense	603,880	
TOTAL INVESTMENT:		12,681,480

US\$

OPERATION

Salaries

3,504,000

38 prof. & tech. x US\$1,000

x 12 months x 4 years

1,824,000

70 support x US\$500 x 12 x 4 years

1,680,000

Materials and supplies

256,000

PRORIEGO spent US\$192,000 in 3 years

US\$192,000 ÷ 3 x 4 years

256,000

Fuel

246,400

32 vehicles x 24,000 km/yr x 32 km/gal

x US\$ 2/gal x 4 years

192,000

20 motorcycles x 10,000 km/yr x 100 km/gal

x US\$ 2/gal x 4 years

16,000

Lubricants: 15% x US\$208,000

31,200

Travel expenses

250,000

38 prof. & tech. x 5.5 days/month x US\$25/day

x 12 months x 4 years

250,000

Operating expenses

856,800

Electricity (TCU: \$200/month Regions:

\$100/month each x 3 x 12 x 4 years)

Telephone (TCU: \$2,000/month Regions:

\$200/month each x 3 x 12 x 4 years)

Rent (TCU: \$2,000/month Regions:

\$1,000/month each x 3 x 12 x 4 years)

312,000

Vehicles insurance: 32 vehicles x \$469/veh/

year x 4 years

60,000

Photocopiers' repairs: 15% of their cost

\$40,000/year x 4 years

24,000

Typewriters' repairs: 15% of their cost

\$60,000/year x 4 years

36,000

Vehicles' repairs: 15% of their cost

1 year x 4 years

384,000

Computers' repairs: 15% of their cost

\$48,009/year x 4 years

28,800

Photocopiers: 5,000 copies/month x

US\$0.05 x 12 x 4 years

12,000

TOTAL OPERATION

5,106,800

TOTAL INVESTMENT IN OPERATION:

17,788,280

TABLE No. 12

CALCULATION OF THE INCOMES PER FAMILY WITH AND WITHOUT THE PROJECT
WITH ALTERNATIVE III

YEAR	TOTAL PRODUCTION (MT) <u>1/</u>	WEIGHTED VALUE (US\$/MT) <u>2/</u>	VALUE OF THE PRODUCTION (000 US\$)	No. OF FAMILIES <u>3/</u>	INCOME PER FAMILY (US\$)
<u>WITH IRRIGATION</u>					
1					
2					
3	788 <u>4/</u>	201	141 <u>4/</u>	31 <u>4/</u>	4,548
4	9,018	201	1,813	356	5,093
5	17,422	201	3,520	681	5,142
6	25,233	201	5,072	1,006	5,042
7	34,709	201	6,976	1,331	5,241
8	35,212	201	7,078	1,331	5,318
9	35,551	201	7,146	1,331	5,349
10	35,722	201	7,180	1,331	5,349
11	35,722	201	7,180	1,331	5,349
12	35,722	201	7,180	1,331	5,349
13	35,722	201	7,180	1,331	5,349
14	35,722	201	7,180	1,331	5,349
15	35,722	201	7,180	1,331	5,349
16	35,722	201	7,180	1,331	5,349
17	35,722	201	7,180	1,331	5,349
18	35,722	201	7,180	1,331	5,349
19	35,722	201	7,180	1,331	5,349
20	35,722	201	7,180	1,331	5,349
<u>WITHOUT IRRIGATION</u>					
1	7,665	167	1,280	1,331	962
2	7,665	167	1,280	1,331	962
3	7,249	167	1,210	1,300	931
4	5,437	167	908	975	931
5	3,624	167	605	650	931
6	1,812	167	303	325	932
7	-	-	-	-	-

1/ Brought forward from Table No. 10

2/ Calculated based on the value of the weighted yield, with irrigation
US\$4,018/ha + 20,048 ha/kg = US\$201/MT, and without irrigation
US\$1,107/ha + 6,621 kg/ha = US\$167/MT. See Table No. 13.

3/ The subprojects are calculated based on 5 families in accordance with
the information of the Project Document.

4/ Actual result of the 88/89 campaign.

TABLE No. 13

ESTIMATED VALUE OF PRODUCTION OF ONE HECTARE OF THE PROJECT
WITH ALTERNATIVE III

	MIX OF THE SCHEDULED CROPS 1/ (%)	YIELD (kg/ha)	WEIGHTED YIELD 2/ (kg/ha)	PRICE ON FARM (US\$/kg)	VALUE OF THE PRODUCTION 3/ (US\$/ha)
<u>WITH IRRIGATION</u>					
Corn	35	7,000	4,410	0.23	1,014
Rice	27	6,500	3,159	0.33	1,042
Beans	2	1,800	65	0.71	46
Vegetables	12	33,500	7,236	0.15	1,085
Melons	23	12,000	4,968	0.15	745
Orchards	1	11,667	210	0.15	86
			20,048		4,018
<u>WITHOUT IRRIG.</u>					
Corn	30	4,535	1,360	0.23	313
Sorghum	10	4,173	417	0.21	87
Rice	10	4,535	453	0.33	149
Soybean	10	1,633	163	0.44	72
Beans	20	1,179	236	0.71	167
Yucca	20	19,958	3,992	0.08	319
			6,621		1,107

OBSERVATION: The yields and prices were furnished by Messrs. Manuel Vargas and Mario Moradel of PRORIEGO.

- 1/ With irrigation: According to 53 studies by "PRORIEGO". Without irrigation: in accordance with the Project Document.
- 2/ Weighted averages calculated with indexes of crops:
with irrigation: 1.8; without irrigation: 1.0 (With irrigation: Column 2 x Column 3 x 1.8) (Without irrigation: Column 2 x Column 3 x 1.0)
- 3/ According to information furnished by the experts in agronomy and economics of the Project.

TABLE No. 14

PRODUCTION COSTS PER HECTARE
WITH ALTERNATIVE III

CROP	COST ^{1/} (US\$/ha)	SCHEDULED MIX (%)	INDEX OF CROP	COST (US\$/ha)
<u>WITH IRRIGATION</u>				
Corn	766	35	1.8	482
Rice	1,038	27	1.8	504
Beans	719	2	1.8	26
Vegetables	2,590	12	1.8	559
Melon	2,100	23	1.8	869
Orchids	1,460	1	1.8	26
				2,466
<u>WITHOUT IRRIGATION</u>				
Corn	518	30	1.0	155
Sorghum	492	10	1.0	49
Rice	639	10	1.0	64
Soybean	435	10	1.0	87
Beans	435	20	1.0	87
Yucca	1,031	20	1.0	206
				648

^{1/} According to M. Moradel and M. Vargas of PRORIEGO. Does not include interests.

ALTERNATIVE IV. TO CONTINUE THE PROJECT WITH ADJUSTMENTS TO THE ORIGINAL DESIGN, INCORPORATING THE DGRH INTO THE PREPARATION OF THE FEASIBILITY STUDIES AND THE EXECUTION OF SUBPROJECTS OF MICRO-IRRIGATION, MAINTAINING THE CURRENT TECHNICAL-OPERATIONAL CAPABILITY OF THE PROJECT, SUBSTITUTING THE AGROTECNIA PERSONNEL AT THE END OF ITS CONTRACT IN JUNE 1990 WITH CONSULTING SERVICES FROM THE PRIVATE SECTOR AND ACTIVELY SPEEDING-UP THE APPROVAL OF THE CREDIT.

This Alternative was analyzed from the points of view of their technical-operational feasibility and financial and economic profitability. The below considerations and hypothesis were taken for the analyses:

- It was assumed that with the Alternative the Project would benefit 1,731 farmers with increased income: it would irrigate 3,040 hectares (PRORIEGO 2,500 ha and the DGRH 540 ha); it would prepare 480 feasibility studies (PRORIEGO 240 and the DGRH 180), and it would receive the approval of US\$13.3 million in credits for the subprojects to be executed. The estimate of these results is based on the technical and operating capability demonstrated by the Project in the execution of the 1989 Work Schedule and by an active speeding-up of the process of the credit system, without which this Alternative could not realized.
- It was assumed that the execution of the Project with this Alternative would not require a modification of the number of professional and technicians it has at present, but that it could reduce its support personnel by 10%.
- It was assumed that the studies prepared by PRORIEGO would be for the beneficiaries that qualify as "credit[worthy] subjects" of the commercial banks and that those prepared by the DGRH would be for the beneficiaries of scarce financial recourses with lands of less than 5 hectares.
- It was assumed that the subprojects executed by PRORIEGO would each have an average of 15 hectares of irrigation and that those executed by the DGRH would have 3 hectares under irrigation. The first surface area mentioned is based on: (a) information of the landholding in Honduras, which indicates that roughly 80% of the agricultural lands of the country have an extension of less than 10 hectares (see attached information); (b) information of the Project Document that confirms this, and (c) information resulting from the analysis of the extensions of 65 subprojects prepared by the Project, which showed a weighted average of 10.8 hectares for each subproject.
- It was assumed that the subprojects executed by PRORIEGO would require credits of US\$2,700/ha for investment and US\$2,333/ha for agricultural equipment or working capital, and that those executed by the DGRH would need US\$2,223/ha for agricultural equipment or working capital; it was also assumed that the DGRH

would require an amount of US\$650,00 to finance the investments of the micro-irrigations.

- It was assumed that the Project already counts with sufficient office, field and transportation equipment to operate with this Alternative, and that it would have to acquire only some equipment to replace the one resulting obsolete or absolutely essential.
- It was assumed that the Project would still require international technical assistance equivalent to 120 persons/month and domestic technical assistance of 15 persons/month. Furthermore, it was assumed that AGROTECNIA would continue to advise the Project until the end of its contract in 1990.
- It was assumed that at the end of the contract with AGROTECNIA, the Project would start to operate with consultants from the private sector, to whom it would furnish guidelines and methodologies for the preparation of the studies and the supervision of the tasks and backing to guarantee the correct execution of the work, which it would grant subsequent to a review of the studies prior to present them to the banks for their financing.
- It was assumed that the consultants from the private sector would be directly contracted by the customers, who would pay them with funds from the credit obtained, in which would be included a percentage for the payment of the consulting services. The evaluation team deems that if it is attempted to develop the consulting services from the private sector, it is not the Project that would have to give out the work but rather the private clients. The Project should also not be the one paying for the services of the consultants with its own funds but rather that the private clients should pay for them with a percentage of the investment credit. The private consultants would have to be skillfully managed to obtain clients and to professionally respond to them and the commercial banks.
- It was assumed that the DGRH would participate in the preparing of the feasibility studies and in the execution of the subprojects of micro-irrigation, for which the Project would furnish it investment resources (US\$650,000) and for agricultural equipment or working capital (US\$1,200,000) to manage them through BANADESA or another financial institution.

With these considerations and hypotheses was prepared the Logical Framework of this Alternative with the recommended adjustments to the original design of the Project. The cost of the Project was also estimated and analyses were made of the economic and financial profitability of the Project. The total cost reached US\$24.5 million, of which US\$19.2 million are for investment and US\$5.2 million are for the operation. The total estimated cost added to what has already been spent or committed until May 1989, would thus increase to US\$32.1 million, a figure rather similar to the one

projected in the original design.

The results of the profitability analyses show an Internal Rate of Financial Return of 142.0% per annum and a Rate of Economic Return of 36.3% per annum, which indicate that the Project is financially and economically feasible within the outlines of this Alternative. This profitability is based however on that the Project can execute every year the 40 subprojects in charge of PRORIEGO and the 45 subprojects in charge of DGRH. For this to take place with this Alternative it is absolutely essential that the credit system operate efficiently at least to finance the 40 subprojects that correspond to PRORIEGO. This Alternative would not be feasible if this should not happen.

CONCLUSION

From the technical-operational point of view it is deemed that the Project is in condition to pursue this ALternative and to reach its goals, which are more realistic than those projected in the original design. The credit would be the only constraint if its system would not allow the financing and the construction of at least the 40 annual PRORIEGO subprojects. In respect to the DGRH there would not arise any problem to obtain the goals since it has the technical and operational capability to execute subprojects of micro-irrigation similar to those it is carrying out with the FAO and BANADESA Project and it would only need the recourses to be furnished by PRORIEGO.

Based on the results of the analyses it is deemed that this Alternative is feasible from the technical, operational, financial and economic profitability points of view. Therefore, it is recommended that it be adopted and that, in its implementation, special attention be paid to the operation of the credit system.

HYPOTHESES USED TO CALCULATE THE PROFITABILITY

FINANCIAL PROFITABILITY:

Useful life: 20 years. No residual value is considered.

Production: According to the mix of the scheduled crops (see Tables 9 and 13).

Weighted yields: With the project: 20,048 kg/ha; without the project: 6,621 kg/ha (see Table 13).

Income: Value of the production on farm (see Tables 6 and 13).

Operating expenses: Operating costs of the PRORIEGO offices (see Table 7).

Production costs: Production costs of the subprojects.

Investment costs: Include investment and working credits (see Tables 7 and 11).

Irrecoverable costs: US\$7,611,000 spent or committed in the 1986-1989 period.

ECONOMIC PROFITABILITY:

Useful life: 20 years. No residual value is considered.

Production: According to the mix of the scheduled crops (see Tables 9 and 13).

Weighted yields: With the project: 20,048 kg/ha; without the project: 6,621 kg/ha (see Table 13).

Benefits: Direct benefits of production. The income was multiplied by the shadow price of the foreign currency (see Table 2).

Operating expenses: Operating costs of the PRORIEGO offices. They were adjusted with the shadow price of the foreign currency (see Table 3).

Production costs: Direct production costs of the subprojects.

Investment costs: Include investment and working credits. They were adjusted with the shadow price of the foreign currency (see Tables 3).

Shadow prices: Foreign currency: 1.7.

Irrecoverable costs: US\$10,785 spent or committed during the 1986-1989 period. (Sunk costs)

TABLE No. 1

CALCULATION OF THE "ECONOMIC" PROFITABILITY
OF THE PROJECT WITH ALTERNATIVE IV

(In thousands of dollars)

YEAR	BENEFITS	OPERATING COSTS OF PRORIEGO	PRODUCTION COSTS FARMS	INVESTMENTS	NET BENEFITS
1-3	-	1,525	-	9,260	(10,785)
4	633	1,405	895	8,224	(9,891)
5	5,143	1,405	4,146	7,958	(8,366)
6	9,720	1,405	7,395	6,907	(5,987)
7	14,431	1,405	10,646	6,084	(3,768)
8	14,431	1,405	10,646	-	2,380
9	14,719	1,405	10,646	-	2,668
10	14,790	1,405	10,646	-	2,739
11	14,790	1,405	10,646	-	2,739
12	14,790	1,405	10,646	-	2,739
13	14,790	1,405	10,646	-	2,739
14	14,790	1,405	10,646	-	2,739
15	14,790	1,405	10,646	-	2,739
16	14,790	1,405	10,646	-	2,739
17	14,790	1,405	10,646	-	2,739
18	14,790	1,405	10,646	-	2,739
19	14,790	1,405	10,646	-	2,739
20	14,790	1,405	10,646	-	2,739

OBSERVATION: The costs incurred during the years 1-3 are deemed "sunk costs" or irrecoverable. The TIRE was calculated excluding these costs.

TIRE: -36.3% per annum

TABLE No. 2

CALCULATION OF THE "ECONOMIC" BENEFITS OF THE PROJECT
WITH ALTERNATIVE IV

(In thousands of dollars)

YEAR	VALUE OF THE INCREASED PRODUCTION 1/	VALUE OF THE EXPORTABLE PRODUCTION 2/	ECONOMIC VALUE OF THE EXPORTABLE PRODUCTION 3/	ECONOMIC BENEFITS 4/
1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	514	170	289	633
5	4,178	1,379	2,344	5,143
6	7,896	2,606	3,430	9,720
7	11,671	3,851	6,547	14,367
8	11,723	3,869	6,577	14,431
9	11,957	3,946	6,708	14,719
10	12,015	3,965	6,740	14,790
11	12,015	3,965	6,740	14,790
12	12,015	3,965	6,740	14,790
13	12,015	3,965	6,740	14,790
14	12,015	3,965	6,740	14,790
15	12,015	3,965	6,740	14,790
16	12,015	3,965	6,740	14,790
17	12,015	3,965	6,740	14,790
18	12,015	3,965	6,740	14,790
19	12,015	3,965	6,740	14,790
20	12,015	3,965	6,740	14,790

1/ Brought forward from Table 6

2/ The 33% of the production corresponds to melons and fruits that are exportable crops.

3/ A shadow price of the foreign currency of 1.7 is used to convert the value of exportable production (Column 2) to its economic value (Column 3).

4/ Column 2 less Column 3 plus Column 4.

TABLE No. 3

"ECONOMIC" INVESTMENT AND OPERATING COSTS OF THE PROJECT
WITH ALTERNATIVE IV 1/

(In thousands of dollars)

ITEM	Y E A R				TOTAL
	4	5	6	7	
<u>Investment</u>					
Credit 2/	5,070	5,070	5,070	5,070	20,280
Equipment	473	420	320	318	1,531
Foreign Tech. Asst.	459	1,683	918	-	3,060
Domestic Tech.Asst.	1,560	-	-	-	1,560
Training	270	270	270	270	1,080
Eval. & Audit	-	136	-	136	272
Contingencies (5%)	392	379	329	290	1,390
Subtotal	<u>8,224</u>	<u>7,958</u>	<u>6,907</u>	<u>6,084</u>	<u>29,173</u>
<u>Operation</u>					
Salaries	876	876	876	876	3,504
Materials & Supplies	109	109	109	109	436
Fuel	126	126	124	124	500
Travel Expenses	80	80	80	79	319
Operating Expenses	214	214	214	215	857
Subtotal	<u>1,405</u>	<u>1,405</u>	<u>1,405</u>	<u>1,405</u>	<u>5,616</u>
T O T A L:	<u><u>9,629</u></u>	<u><u>9,363</u></u>	<u><u>8,312</u></u>	<u><u>7,489</u></u>	<u><u>34,789</u></u>

1/ The credit, equipment, foreign technical assistance, training, evaluation and audit, materials and supplies, and fuel values were converted to their economic values by using the shadow price of the foreign currency, estimated at 1.7.

2/ It was assumed that 75% of the credit is in foreign currency.

TABLE No. 4

ECONOMIC COSTS OF THE PRODUCTION OF THE FARMS
WITH ALTERNATIVE IV

(In thousands of dollars)

YEAR	INCREASED PRODUCTION COST 1/	PRODUCTION COSTS IN FOREIGN CURRENCY 2/	"ECONOMIC" COSTS IN FOREIGN CURRENCY 3/	TOTAL "ECONO- MIC" PRODUCTION COSTS 4/
4	630	378	643	895
5	2,920	1,752	2,978	4,146
6	5,208	3,125	5,312	7,395
7	7,497	4,498	7,647	10,646
8	7,497	4,498	7,647	10,646
9	7,497	4,498	7,647	10,646
10	7,497	4,498	7,647	10,646
11	7,497	4,498	7,647	10,646
12	7,497	4,498	7,647	10,646
13	7,497	4,498	7,647	10,646
14	7,497	4,498	7,647	10,646
15	7,497	4,498	7,647	10,646
16	7,497	4,498	7,647	10,646
17	7,497	4,498	7,647	10,646
18	7,497	4,498	7,647	10,646
19	7,497	4,498	7,647	10,646
20	7,497	4,498	7,647	10,646

1/ Brought forward from Table No. 8

2/ 60% of Column 2 was considered.

3/ A shadow price of 1.7 is used for the foreign currency (Column 3 x 1.7).

4/ Is equal to Column 2 less Column 3 plus Column 4.

TABLE No. 5

CALCULATION OF THE "FINANCIAL" PROFITABILITY
OF THE PROJECT WITH ALTERNATIVE IV

(In thousands of dollars)

YEAR	INCOME <u>1/</u>	PRORIEGO OPERATING COSTS <u>2/</u>	PRODUCTION COSTS FARMS <u>3/</u>	INVESTMENTS <u>4/</u>	NET INCOME
1-3		1,344		6,267	(7,611)
4	514	1,308	630	5,863	(7,289)
5	4,178	1,308	2,920	5,036	(5,096)
6	7,896	1,307	5,208	4,417	(3,036)
7	11,671	1,307	7,497	3,934	(1,067)
8	11,959	1,307	7,497	-	3,153
9	12,015	1,307	7,497	-	3,211
10	12,015	1,307	7,497	-	3,211
11	12,015	1,307	7,497	-	3,211
12	12,015	1,307	7,497	-	3,211
13	12,015	1,307	7,497	-	3,211
14	12,015	1,307	7,497	-	3,211
15	12,015	1,307	7,497	-	3,211
16	12,015	1,307	7,497	-	3,211
17	12,015	1,307	7,497	-	3,211
18	12,015	1,307	7,497	-	3,211
19	12,015	1,307	7,497	-	3,211
20	12,015	1,307	7,497	-	3,211

OBSERVATION: The incurred expenses during years 1-3 were considered irrecoverable (sunk costs)

1/ Brought forward from Table No. 6

2/ Brought forward from Table No. 7

3/ Brought forward from Table No. 8

TIRF: 142.0% per annum

TABLE No. 6

PRODUCTION AND VALUE OF THE PRODUCTION OF THE PROJECT
WITH ALTERNATIVE IV

(In thousands of dollars)

YEAR	PRODUCTION (M/T) 1/		VALUE (US\$ 000) 2/		
	W/IRRIG.	WITHOUT IRRIGATION	W/IRRIG.	WITHOUT IRRIG.	INCREASE
1	-	20,128	-	3,361	-
2	-	20,128	-	3,361	-
3	788	19,466	141 3/	3,251	-
4	14,685	14,955	2,952	2,438	514
5	28,869	9,733	5,803	1,625	4,178
6	43,331	4,866	8,709	813	7,896
7	58,066	-	11,671	-	11,671
8	58,324	-	11,723	-	11,723
9	59,498	-	11,957	-	11,959
10	59,778	-	12,015	-	12,015
11	59,778	-	12,015	-	12,015
12	59,778	-	12,015	-	12,015
13	59,778	-	12,015	-	12,015
14	59,778	-	12,015	-	12,015
15	59,778	-	12,015	-	12,015
16	59,778	-	12,015	-	12,015
17	59,778	-	12,015	-	12,015
18	59,778	-	12,015	-	12,015
19	59,778	-	12,015	-	12,015
20	59,778	-	12,015	-	12,015

1/ Brought forward from Table No. 9

2/ Calculated based on the value of the weighted yield: with irrigation:
US\$4,018/ha ÷ 20,048 kg/ha = US\$201 m/t; without irrigation:
US\$1,107 ha ÷ 6,621 kg/ha = US\$167 m/t. See Table No. 13.

3/ Real value of the 1988/89 campaign.

TABLE No. 7

PRORIEGO'S INVESTMENT AND OPERATING COSTS
WITH ALTERNATIVE IV

(In thousands of dollars)

ITEM	Y E A R				TOTAL
	4	5	6	7	
<u>Investment</u>					
Credit	3,320	3,320	3,320	3,320	13,280
Equipment	277	247	188	188	900
Foreign Tech. Assist.	270	990	540	-	1,800
Domestic Tech.Assist.	1,560	-	-	-	1,560
Training	159	159	159	159	636
Evaluation & Audit	-	80	-	80	160
Contingencies (5%)	279	240	210	187	916
Subtotal	<u>5,865</u>	<u>5,036</u>	<u>4,417</u>	<u>3,934</u>	<u>19,252</u>
<u>Operation</u>					
Salaries	876	876	876	876	3,504
Materials & Supplies	64	64	64	64	256
Fuel	74	74	74	74	294
Travel Expenses	80	80	80	80	319
Operating Expenses	214	214	214	215	857
Subtotal	1,308	1,308	1,308	1,308	5,230
TOTAL:	<u><u>7,173</u></u>	<u><u>6,344</u></u>	<u><u>5,724</u></u>	<u><u>5,241</u></u>	<u><u>24,482</u></u>

TABLE No. 8

**INCREASED PRODUCTION COSTS FOR FARMS
WITH ALTERNATIVE IV**

(In thousands of dollars)

YEAR	SURFACE AREA		PRODUCTION COSTS		INCREASE (000 US\$)
	W/IRRIG. (ha)	WITHOUT IRRIG.	W/IRRIG.	WITHOUT/IRRIG. 1/ (000 US\$)	
1	-	3,040	-	1,970	-
2	-	3,040	-	1,970	-
3	100	2,940	141 2/	1,905	-
4	835	2,205	2,059	1,149	630
5	1,570	1,470	3,872	952	2,920
6	2,305	735	5,684	476	5,208
7	3,040	-	7,497	-	7,497
8	3,040	-	7,497	-	7,497
9	3,040	-	7,497	-	7,497
10	3,040	-	7,497	-	7,497
11	3,040	-	7,497	-	7,497
12	3,040	-	7,497	-	7,497
13	3,040	-	7,497	-	7,497
14	3,040	-	7,497	-	7,497
15	3,040	-	7,497	-	7,497
16	3,040	-	7,497	-	4,497
17	3,040	-	7,497	-	7,497
18	3,040	-	7,497	-	7,497
19	3,040	-	7,497	-	7,497
20	3,040	-	7,497	-	7,497

1/ The production cost with irrigation is of US\$2,466/ha and without irrigation US\$648/ha. See Table No. 14.

SOURCE: Manuel Vargas and Mario Moradel of PRORIEGO.

2/ Actual value of the 1988/89 campaign.

TABLE No. 9

TOTAL PRODUCTION OF THE PROJECT
WITH ALTERNATIVE IV

YEAR	SURFACE AREA		PRODUCTION	
	W/IRRIG. 1/ (ha)	WITHOUT IRRIG. (ha)	W/IRRIG. 2/ (M/T)	WITHOUT IRRIG. 3/ (M/T)
1	-	3,040		20,128
2	-	3,040		20,128
3	100	2,940	788	19,466
4	835	2,205	14,685	14,599
5	1,570	1,470	28,869	9,733
6	2,305	735	43,331	4,866
7	3,040	-	58,066	-
8	3,040	-	58,324	-
9	3,040	-	59,489	-
10	3,040	-	59,778	-
11	3,040	-	59,778	-
12	3,040	-	59,778	-
13	3,040	-	59,778	-
14	3,040	-	59,778	-
15	3,040	-	59,778	-
16	3,040	-	59,778	-
17	3,040	-	59,778	-
18	3,040	-	59,778	-
19	3,040	-	59,778	-
20	3,040	-	59,778	-

1/ Calculated based on the pace of the incorporation of the subprojects into the Project. The 7th year shows 160 subprojects of 15 hectares each and 180 subprojects of 3 hectares each $(160 \times 15 + 180 \times 3) = 2,940$ ha + 100 hectares already irrigated = 3,040 hectares.

2/ Brought forward from Table No. 10.

3/ The production without irrigation is equal to the product of the surface area times 6,621 kg/ha, which is the weighted yield without irrigation (Source: Table No. 13).

TABLE No. 10

INCREASE OF PRODUCTION OF THE PROJECT
WITH ALTERNATIVE III

(In thousands of kilos)

IRRIGATED SURFACE (ha)	Y E A R									
	3	4	5	6	7	8	9	10	-	20
100	788 ^{1/}	800	822	838	838	838	838	838	838	838
435		8,218 ^{2/}	8,382	8,550	8,721	8,721	8,721	8,721	8,721	8,721
435			8,218	8,382	8,550	8,721	8,721	8,721	8,721	8,721
435				8,217	8,382	8,550	8,721	8,721	8,721	8,721
435					8,218	8,382	8,550	8,721	8,721	8,721
TOTAL:	780	9,018	17,422	25,233	34,709	35,212	35,551	35,722	35,722	35,722

OBSERVATION: On each line is shown the annual production on the irrigated surface. Every year the production increases by 2% until reaching a weighted yield of 20,048 kg/ha in the 4th year, as of which it stabilizes.

1/ Actual result of the 88/89 campaign.

TABLE No. 11

ITEMIZED INVESTMENT AND OPERATING COSTS
FOR ALTERNATIVE III

<u>INVESTMENT</u>		US\$
Credit		<u>7,240,000</u>
Investment credit	3,240,000	
(80 subprojects x 15 ha x US\$2,700/ha)		
Equipment credit subprojects PRORIEGO	2,800,000	
(80 subprojects x 15 ha x US\$2,333/ha)		
Equipment credit subprojects DGRH	1,200,000	
(180 subprojects x 3 ha x US\$ 2,223/ha)		
Equipment		<u>900,000</u>
20 typewriters x US\$ 1,500 each	30,000	
5 vehicles x US\$20,000 each	100,000	
10 motorcycles x US\$2,000 each	20,000	
Irrigation equipment for DGRH	650,000	
Other equipment	100,000	
Foreign Technical Assistance		<u>1,800,000</u>
120 people/month x US\$15,000/month	1,800,000	
Domestic Technical Assistance		<u>1,560,000</u>
15 people/month X US\$4,000 month	60,000	
AGROTECNIA: 25 prof. & tech. x US\$2000/months		
x 12 months	600,000	
26 support personnel x US\$700/		
month x 12 months	218,400	
Travel expenses and overhead 83%	681,600	
Training		<u>417,600</u>
88 prof. x 8 sessions x 5 days each x \$30/day	105,600	
120 tech. x 8 sessions x 5 days each x \$30/day	144,000	
1400 farmers x 8 sessions x 3 days each		
x \$5/day	168,000	
Evaluation and audit		<u>160,000</u>
2 evaluations x US\$80,000 each	160,000	
Contingencies		<u>603,880</u>
5% of the total expense	603,880	
TOTAL INVESTMENT:		12,681,480

	<u>US\$</u>
OPERATION	
Salaries	<u>3,504,000</u>
38 prof. & tech. x US\$1,000 x 12 months x 4 years	1,824,000
70 support x US\$500 x 12 x 4 years	1,680,000
Materials and supplies	<u>256,000</u>
PRORIEGO spent US\$192,000 in 3 years US\$192,000 ÷ 3 x 4 years	256,000
Fuel	<u>246,400</u>
32 vehicles x 24,000 km/yr x 32 km/gal x US\$ 2/gal x 4 years	192,000
20 motorcycles x 10,000 km/yr x 100 km/gal x US\$ 2/gal x 4 years	16,000
Lubricants: 15% x US\$208,000	31,200
Travel expenses	<u>250,000</u>
38 prof. & tech. x 5.5 days/month x US\$25/day x 12 months x 4 years	250,000
Operating expenses	<u>856,800</u>
Electricity (TCU: \$200/month Regions: \$100/month each x 3 x 12 x 4 years)	
Telephone (TCU: \$2,000/month Regions: \$200/month each x 3 x 12 x 4 years)	
Rent (TCU: \$2,000/month Regions: \$1,000/month each x 3 x 12 x 4 years)	312,000
Vehicles insurance: 32 vehicles x \$469/veh/ year x 4 years	60,000
Photocopiers' repairs: 15% of their cost \$40,000/year x 4 years	24,000
Typewriters' repairs: 15% of their cost \$60,000/year x 4 years	36,000
Vehicles' repairs: 15% of their cost 1 year x 4 years	384,000
Computers' repairs: 15% of their cost \$48,009/year x 4 years	28,800
Photocopiers: 5,000 copies/month x US\$0.05 x 12 x 4 years	12,000
TOTAL OPERATION	<u>5,106,800</u>
TOTAL INVESTMENT IN OPERATION:	<u><u>17,788,280</u></u>

TABLE No. 12

**CALCULATION OF THE INCOMES PER FAMILY WITH AND WITHOUT THE PROJECT
WITH ALTERNATIVE IV**

YEAR	TOTAL PRODUCTION (MT) <u>1/</u>	WEIGHTED VALUE (US\$/MT) <u>2/</u>	VALUE OF THE PRODUCTION (000 US\$)	No. OF FAMILIES <u>3/</u>	INCOME PER FAMILY (US\$)
<u>WITH IRRIGATION</u>					
1	-	-	-	-	-
2	-	-	-	-	-
3	788 <u>4/</u>	201	141 <u>4/</u>	31 <u>4/</u>	4,548
4	14,685	201	2,952	456	6,474
5	28,869	201	5,803	881	6,587
6	43,331	201	8,709	1,306	6,668
7	58,066	201	11,671	1,731	6,740
8	58,324	201	11,723	1,731	6,772
9	59,489	201	11,957	1,731	6,910
10	59,778	201	12,015	1,731	6,941
11	59,778	201	12,105	1,731	6,941
12	59,778	201	12,105	1,731	6,941
13	59,778	201	12,105	1,731	6,941
14	59,778	201	12,105	1,731	6,941
15	59,778	201	12,105	1,731	6,941
16	59,778	201	12,105	1,731	6,941
17	59,778	201	12,105	1,731	6,941
18	59,778	201	12,105	1,731	6,941
19	59,778	201	12,105	1,731	6,941
20	59,778	201	12,105	1,731	6,941
<u>WITHOUT IRRIGATION</u>					
1	20,128	167	3,361	1,731	1,942
2	20,128	167	3,361	1,731	1,941
3	19,466	167	3,251	1,700	1,912
4	14,599	167	2,438	1,275	1,912
5	9,733	167	1,625	850	1,912
6	4,866	167	813	425	1,913
7	-	-	-	-	-

1/ Brought forward from Table No. 10

2/ Calculated based on the value of the weighted yield, with irrigation
 $US\$4,018/ha + 20,048 \text{ ha/kg} = US\$201/MT$, and without irrigation
 $US\$1,107/ha + 6,621 \text{ kg/ha} = US\$167/MT$. See Table No. 13.

3/ The subprojects are calculated based on 5 families in accordance with
the information of the Project Document.

4/ Actual result of the 88/89 campaign.

TABLE No. 13

ESTIMATED VALUE OF PRODUCTION OF ONE HECTARE OF THE PROJECT
WITH ALTERNATIVE IV

	MIX OF THE SCHEDULED CROPS 1/ (%)	YIELD (kg/ha)	WEIGHTED YIELD 2/ (kg/ha)	PRICE ON FARM (US\$/kg)	VALUE OF THE PRODUCTION 3/ (US\$/ha)
<u>WITH IRRIGATION</u>					
Corn	35	7,000	4,410	0.23	1,014
Rice	27	6,500	3,159	0.33	1,042
Beans	2	1,800	65	0.71	46
Vegetables	12	33,500	7,236	0.15	1,085
Melons	23	12,000	4,968	0.15	745
Orchards	1	11,667	210	0.15	86
			<u>20,048</u>		<u>4,018</u>
<u>WITHOUT IRRIG.</u>					
Corn	30	4,535	1,360	0.23	313
Sorghum	10	4,173	417	0.21	87
Rice	10	4,535	453	0.33	149
Soybean	10	1,633	163	0.44	72
Beans	20	1,179	236	0.71	167
Yucca	20	19,958	3,992	0.08	319
			<u>6,621</u>		<u>1,107</u>

OBSERVATION: The yields and prices were furnished by Messrs. Manuel Vargas and Mario Morádel of PRORIEGO.

- 1/ With irrigation: According to 53 studies by "PRORIEGO". Without irrigation: in accordance with the Project Document.
- 2/ Weighted averages calculated with indexes of crops: with irrigation: 1.8; without irrigation: 1.0 (With irrigation: Column 2 x Column 3 x 1.8) (Without irrigation: Column 2 x Column 3 x 1.0)
- 3/ According to information furnished by the experts in agronomy and economics of the Project.

TABLE No. 14

PRODUCTION COSTS PER HECTARE
WITH ALTERNATIVE IV V/M

CROP	COST 1/ (US\$/ha)	SCHEDULED MLX (%)	INDEX OF CROP	COST (US\$/ha)
<u>WITH IRRIGATION</u>				
Corn	766	35	1.8	482
Rice	1,038	27	1.8	504
Beans	719	2	1.8	26
Vegetables	2,590	12	1.8	559
Melon	2,100	23	1.8	869
Orchids	1,460	1	1.8	26
				<hr/> 2,466
<u>WITHOUT IRRIGATION</u>				
Corn	518	30	1.0	155
Sorghum	492	10	1.0	49
Rice	639	10	1.0	64
Soybean	435	10	1.0	87
Beans	435	20	1.0	87
Yucca	1,031	20	1.0	206
				<hr/> 648

1/ According to M. Moradel and M. Vargas of PRORIEGO. Does not include interests.

LOGICAL FRAMEWORK OF THE IRRIGATION DEVELOPMENT PROJECT

WITH THE MODIFICATIONS RECOMMENDED FOR THE ORIGINAL DESIGN WITH ALTERNATIVE IV

OBJECTIVES	GOALS	MEANS OF VERIFICATION	IMPORTANT HYPOTH.						
AIM									
Increased income of beneficiary agricult. producers	Year	4	5	6	7	20			
		88/89	89/90	90/91	91/92	92/93	2000		
	No. of benef. families	31	546	881	1,306	1,731	1,731		
	Family income w/irrig.	4,518	6,474	6,587	6,669	6,749	6,941		
	Family income w/o irrig	---	1,912	1,912	1,913	---	---		
Total family income	6,460	6,386	6,499	6,351	6,749	6,941			
PURPOSE									
Increase of production and agricultural productivity	Year	4	5	6	7	20			
		88/89	89/90	90/91	91/92	92/93	2000		
	Cultivated area (ha)	3,040	3,040	3,040	3,040	3,040	3,040		
	With irrigation	100	825	1,370	2,305	3,040	3,040		
	Without irrigation	2,940	2,205	1,470	735	---	---		
	Production (000 M/T)								
	With irrigation	0.6	16.7	28.9	43.3	58.0	59.8		
	Without irrigation	19.5	14.2	9.7	4.9	---	---		
	TOTAL	20.2	29.3	38.6	48.2	58.0	59.8		
	Overall productivity (MT/ha)								
With irrigation	8.9	17.6	15.4	18.0	19.1	19.7			
Without irrigation	6.6	6.6	6.6	6.6	---	---			
Increase	2.2	11.0	11.8	12.2	19.1	19.7			
PRODUCTS									
Component		Year	4	5	6	7			
			88/89	89/90	90/91	91/92	92/93		
1. Feas. studies of sub-projects, prepared by PRORIEGO	1. Number of studies		60	60	60	60	60	1. Studies	
2. Feas. studies of sub-projects of micro-irr prepared by DGRH	2. Number of studies			60	60	60	60	2. Studies	
3. Subprojects' execut. by PRORIEGO	3. Subprojects (ea. 15 ha average)		40	40	40	40	40	3. Records of the Project	
4. Subprojects execut. by the DGRH	4. Subprojects (ea. 3 ha average)		45	45	45	45	45	4. Records of the Project and DGRH of const. carried out	
	5. (Various means)							5. Promotion programs carried out	
	6. (No. of qualified)		37	37	38	38	38	6. List of courses and qualified personnel	
	7. (No. of qualified)		45	45	45	45	45	7. List of courses and qualified personnel	
	8. (No. of qualified)		350	450	600	600	600	8. List of courses and farmers	
Component II	9. (No. of visits)		1,200	1,266	2,010	2,214	2,214	9. Record of visits of extension workers	
5. Irrigation promotion, carried out	10. (number)		40	40	40	40	40	10-12. Record of credits approved of Component III	
6. Training of professionals, carried out	11. (US\$000 approved)		1,620	1,620	1,620	1,620	1,620	13. Documents	
7. Training of technicians, carried out	12. (US\$000 approved)		1,700	1,700	1,700	1,700	1,700	14. Plan Document	
8. Training of farmers carried out	13. The objectives and goals of the DGRH are defined with the assistance of two specialists in hydraulic resources management, one foreign and one domestic, and a foreign specialist in direction and management.							15. Document and official institution of establishment of the structure	
9. Extension services rendered	14. Once the objectives and goals of the DGRH are defined, an Annual Action Plan with managerial outlook is prepared. The same specialists of Product 13 assist in the preparation.							16. Inspection	
Component III	15. To execute the prepared Action Plan, the same specialists of Product 13 recommend and have approved a new organizational structure.							17. Progress reports of the Plan	
10. Credits approved by banks	16. PRORIEGO analyzes the requirements of office and work equipment of the DGRH and assists in the implementation of same.								
11. Approved amount of investment credit	17. PRORIEGO supervises the execution of the Action Plan of the DGRH, furnishing orientation based on its experience in the use of the SMP in the execution of the 1989 Action Plan.								
12. Amount of equipment credit approved									
Component IV									
13. Defined objectives of the DGRH									
14. Annual Action Plan of the DGRH, prepared									
15. Organizational structure of the DGRH, established									
16. DGRH offices, equipped									
17. Supervision of the execution of the DGRH Action Plan, carried out.									

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PRODUCT 6: TRAINING OF PROFESSIONALS

T O P I C S	P A R T I C I P A N T S
Water sources	Agronomical Engineers
Agricultural soils	Civil Engineers
Production techniques	Agricultural Economists
Irrigation methods	Agricultural Engineers
Designs of irrigation systems	
Formulation of projects	
Evaluation of projects	
Handling of projects	
Production of irrigated crops	

No. OF QUALIFIED PROFESSIONALS

Institutions	89/90	90/91	91/92	92/93	TOTAL
DGRH	11	11	11	11	44
PRORIEGO	11	11	11	11	44
Extension Service of the D.G.	15	15	16	16	62
	—	—	—	—	—
TOTAL:	37	37	38	38	150

1 or 2 courses or seminars of 5-6 days per year.

PRODUCT 7: TRAINING OF TECHNICIANS

T O P I C S	P A R T I C I P A N T S
Topography	Agronomists
Agricultural furrows	Topographers
Irrigation methods	Economists
Operation and maintenance	Social promoters
Technological packages of crops	Production technicians

No. OF QUALIFIED TECHNICIANS

Institutions	89/90	90/91	91/92	92/93	TOTAL
DGRH	4	4	4	4	16
PRORIEGO	12	12	12	12	68
Extension Service of the	29	29	29	29	29
	—	—	—	—	—
TOTAL:	45	45	45	45	180

HYPOTHESES: 1 or 2 courses or seminars of 5-6 days per year

PRODUCT 8: TRAINING OF FARMERS

T O P I C S	P A R T I C I P A N T S
Agricultural soils	Farmers
Cultivation practices	
Irrigation methods	
Operation and maintenance of irrigation systems	
Cultivation techniques	
Administration of farms	

No. OF QUALIFIED FARMERS

89/90	90/91	91/92	92/93	TOTAL
350	450	600	600	2,000

2 or 3 annual seminars
 2 or 3 annual courses
 3 or 4 annual field days

**PRODUCT 9: RURAL EXTENSION SERVICES
No. OF VISITS TO FARMS**

	88/89	89/90	90/91	91/92	92/93	TOTAL
Subprojects PRORIEGO	8	40	40	40	40	168
Subprojects DGRH	-	45	45	45	45	180
						<u>348</u>
Visits	104	104	56	56	—	
		1,105	1,105	552	557	
			1,105	1,105	552	
				1,105	1,105	
TOTAL VISITS:	<u>104</u>	<u>1,209</u>	<u>2,266</u>	<u>2,818</u>	<u>2,214</u>	

REQUIRED EXTENSIONISTS

No. of working days 1/	192					
No. of extensionists 2/	1	6	12	15	17	
Variable % due to opportunities, training and vacations 25%	2	8	15	19	21	
Variable % due to location, size and problems 50-10%	3	11	19	23	23	23

HYPOTHESES:

First two years:

- 2 monthly visits to each property during the irrigation season. 120 days - 4 months 8 visits
- 1 monthly visit to each property during the dry season (provisionally). 150 days - 5 months 5 visits
- TOTAL: 15 visits**

Second two years:

- 1 monthly visit to each property during the irrigation season. 4 visits
- 0.5 monthly visits to each property during the dry season (provisionally). 3 visits
- TOTAL: 7 visits**

1/ $\frac{270 \times 5}{7} = 192$

2/ 1 day for each visit

HYPOTHESES

- 1 - It is assumed that all the credits for the infrastructure will be granted for a period of 6 years with a 1 year grace period.
- 2 - The loans for working capital shall be granted for a period of one year, renewable every year at their settlement, as it is the norm for almost all the banks of the system.
- 3 - It was assumed that the make-up of the loans is as follows:

<u>YEAR</u>	<u>TOTAL PLACED</u>	<u>CREDITS FOR INFRASTRUCTURE</u>	<u>CREDITS FOR WORKING CAPITAL</u>	<u>PERCENTAGE</u>
1989	2,500,000.00	1,125,000.00	1,375,000.00	10%
1990	3,500,000.00	1,575,000.00	1,925,000.00	14%
1991	5,000,000.00	2,250,000.00	2,750,000.00	20%
1992	7,000,000.00	3,150,000.00	3,850,000.00	28%
1993	7,000,000.00	3,150,000.00	3,850,00	28%

- 5 - The recovery of the credits for working capital shall be at date due in one only annual payment, and that of the credits for the infrastructure through annual equal installments which coincide with the end of the production cycle.
- 6 - The calculation of the interests is made by taking as basis the beginning of the period in which the total disbursement is made of each amount and shall be maintained until the end of said period.
- 7 - The rediscount rate shall not vary during the period under study.
- 8 - The yields of the funds shall be invested in bearer government bonds and at a rate of 10%.
- 9 - It is assumed that, during the life of the credits for the infrastructure, the participating banks will annually renew the working capital every year of operation until the total payment of the credit.
- 10 - The amortization of the loans for the infrastructure shall be assigned to the borrower in an automatic manner and in the manner in which it will be collected.
- 11 - The distribution of the earnings on interests and other charges shall be made at the end of the period.

LANDHOLDING ACCORDING TO THE SIZE OF THE FARM
 REGION: OCCIDENTAL (Area in has.)

Size of the farm	No. of Prod	Average area	Total area	PERCENTAGES						Conveyed land
				Land			Lease			
				Own	Nat.	Comm.	Fee simple	Nat. land		
< 1	178	0.55	98.56	0.375	0.048	0.120	0.147	0.011	0.277	
1 < 2	185	1.41	260.31	0.473	0.072	0.121	0.139	0.033	0.161	
2 < 3	115	2.41	278.97	0.473	0.117	0.125	0.140	0.009	0.140	
3 < 4	60	3.49	209.42	0.540	0.126	0.077	0.031	0.029	0.067	
4 < 5	47	4.51	221.15	0.646	0.077	0.109	0.043	0.003	0.090	
5 < 10	85	6.97	586.80	0.684	0.070	0.053	0.051	0.002	0.114	
10 < 20	67	14.64	969.74	0.690	0.024	0.107	0.025	0.014	0.029	
20 < 50	71	32.53	2307.37	0.770	0.039	0.028	0.011	0.000	0.092	
50 < 100	11	62.84	691.29	0.887	0.061	0.051	0.000	0.000	0.099	
100 < 200	7	130.91	915.27	0.100	0.000	0.000	0.000	0.000	0.000	
200 < 500	5	272.00	1360.00	0.525	0.000	0.475	0.000	0.000	0.000	
500 < 1000	2	679.00	1378.00	0.100	0.000	0.000	0.000	0.000	0.000	
1000 < 2500	0			1.000						
> 2500	1	2542.22	2542.22	0.000	0.000	0.000				
TOTAL	838	14.28	11767.44	0.621	0.026	0.095	0.016	0.003	0.039	

LANDHOLDING ACCORDING TO SIZE OF FARM

REGION: CENTRAL - OCCIDENTAL (Area in has.)

Size of the farm	No. of Prod	Average area	Total area	PERCENTAGES						Conveyed land
				Land			Lease			
				Own	Nat.	Comm.	Fee simple	Nat. land		
< 1	184	0.57	104.60	0.423	0.128	0.080	0.115	0.051	0.190	
1 < 2	178	1.41	251.56	0.459	0.037	0.237	0.076	0.046	0.123	
2 < 3	125	2.45	304.02	0.503	0.049	0.269	0.061	0.049	0.070	
3 < 4	57	3.37	193.46	0.542	0.013	0.260	0.041	0.026	0.017	
4 < 5	72	4.51	324.93	0.610	0.013	0.304	0.030	0.013	0.031	
5 < 10	203	7.21	1478.94	0.675	0.015	0.240	0.043	0.003	0.024	
10 < 20	122	13.67	1667.59	0.679	0.022	0.215	0.074	0.006	0.001	
20 < 50	86	31.07	2755.93	0.726	0.011	0.171	0.091	0.006	0.014	
50 < 100	15	68.02	1020.09	0.745	0.011	0.135	0.058	0.004	0.044	
100 < 200	12	131.89	1582.63	0.940	0.012	0.009	0.038	0.000	0.009	
200 < 500	11	275.46	2952.24	0.915	0.077	0.007	0.000	0.000	0.000	
500 < 1000										
1000 < 2500										
> 2500										
TOTAL	1073	12.14	13031.09	0.749	0.031	0.179	0.044	0.006	0.024	

LANDHOLDING ACCORDING TO SIZE OF FARM

REGION: North (Area in has.)

Size of the farm	No. of Prod	Average area	Total area	PERCENTAGES						Conveyed land
				Land			Lease			
				Own	Nat.	Comm.	Fee simple	Nat. land		
< 1	353	0.52	185.21	0.261	0.037	0.255	0.120	0.114	0.221	
1 < 2	202	1.40	283.92	0.265	0.102	0.210	0.096	0.118	0.201	
2 < 3	100	2.45	245.36	0.270	0.032	0.379	0.042	0.061	0.140	
3 < 4	46	3.48	167.28	0.341	0.123	0.273	0.052	0.041	0.120	
4 < 5	32	4.50	143.26	0.432	0.063	0.320	0.050	0.070	0.095	
5 < 10	20	7.16	143.04	0.473	0.131	0.271	0.030	0.009	0.102	
10 < 20	12	14.07	168.84	0.531	0.064	0.178	0.025	0.047	0.055	
20 < 50	24	31.23	749.52	0.674	0.055	0.205	0.009	0.022	0.035	
50 < 100	42	75.11	3150.67	0.769	0.071	0.399	0.000	0.033	0.018	
100 < 200	27	139.39	3763.41	0.810	0.090	0.025	0.000	0.004	0.041	
200 < 500	15	231.20	3468.00	0.930	0.000	0.000	0.000	0.000	0.000	
500 < 1000	2	707.31	1414.62	0.753	0.247	0.000	0.000	0.000	0.000	
1000 < 2500	1	1399.00	1399.00	1.000	0.000	0.000	0.000	0.000	0.000	
	1068	17.66	18551.96	0.773	0.069	0.093	0.008	0.006	0.032	

LANDHOLDING ACCORDING TO SIZE OF FARM

REGION: SOUTH (Area in has.)

Size of the farm	No. of Prod	Average area	Total area	PERCENTAGES						Conveyed land
				Land			Lease			
				Own	Nat.	Comm.	Fee simple	Nat. land		
< 1	133	0.48	64.13	0.353	0.041	0.069	0.137	0.149	0.221	
1 < 2	124	1.42	179.44	0.378	0.029	0.105	0.107	0.079	0.220	
2 < 3	62	2.49	155.59	0.536	0.077	0.067	0.070	0.096	0.153	
3 < 4	57	3.52	200.64	0.711	0.017	0.000	0.035	0.114	0.179	
4 < 5	47	4.42	207.76	0.613	0.020	0.086	0.032	0.075	0.155	
5 < 10	56	7.11	398.22	0.679	0.030	0.045	0.020	0.132	0.072	
10 < 20	74	13.93	1030.82	0.731	0.013	0.056	0.009	0.010	0.061	
20 < 50	49	20.70	1004.29	0.851	0.007	0.032	0.000	0.110	0.020	
50 < 100	7	73.64	515.48	0.337	0.031	0.000	0.000	0.012	0.107	
100 < 200	19	139.20	2644.80	0.823	0.007	0.000	0.000	0.000	0.000	
200 < 500	4	246.77	987.08	1.000	0.000	0.000	0.000	0.000	0.000	
500 < 1000	4	799.36	3197.44	1.000	0.000	0.000	0.000	0.000	0.000	
1000 < 2500	0									
TOTAL	674	16.00	10319.99	0.820	0.021	0.031	0.017	0.017	0.100	

ESTIMATES OF THE RECOVERIES OF THE PRORIEGO CREDIT

	1987	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Loans for infrastructure	1,125,000 2,700,000	1,575,000 4,950,000	2,250,000 8,950,000	3,150,000 8,100,000	3,150,000 11,250,000						
Loans for Working Capital	1,375,000 3,300,000	1,925,000 6,050,000	2,750,000 9,900,000	3,850,000 9,900,000	3,850,000 13,750,000						
Theor. Recovery of Infrastructure Loan		138,634 487,991	349,357 987,991	669,547 1,156,538	1,135,949 2,293,497	1,581,557 3,955,044	1,860,545 5,015,939	1,910,620 7,626,609	1,644,000 9,271,409	1,294,090 10,566,307	600,000 11,250,000
Income from Loan Interests	300,000 1,020,000	720,000 2,323,364	1,392,354 2,323,364	2,101,642 4,124,806	2,821,219 6,445,021	2,724,782 9,170,803	2,529,394 11,896,197	2,137,025 13,833,282	1,600,010 15,522,199	1,161,452 16,603,552	540,000 17,250,000
Income from Bonds Interests		30,000 86,100	56,100 86,100	232,336 316,836	442,401 769,917	720,382 1,489,319	1,091,080 2,470,597	1,672,544 3,563,543	1,033,705 4,597,240	811,230 5,430,402	450,000 5,980,000
Income from Reserve Funds in Bonds		23,750 104,500	82,750 104,500	185,250 287,750	356,250 646,000	553,750 1,239,750	531,250 2,071,700	702,500 2,973,500	883,500 3,857,000	731,500 4,580,500	390,000 4,987,500
Debt Service	50,000 170,000	120,000 370,000	220,000 370,000	350,000 750,000	500,000 1,250,000	500,000 1,750,000	550,000 2,250,000	450,000 2,700,000	300,000 3,000,000	200,000 3,350,000	100,000 3,500,000
BCH Admin. Expenses	12,500 42,500	30,000 42,500	55,000 97,500	70,000 187,500	125,000 312,500	125,000 437,500	125,000 562,500	112,500 675,000	95,000 770,000	75,000 840,000	55,000 975,000
Reserves of Security Fund	112,500 382,500	270,000 382,500	495,000 877,500	810,000 1,637,500	1,125,000 2,812,500	1,125,000 3,937,500	1,125,000 5,062,500	1,012,500 6,075,000	855,000 6,930,000	630,000 7,560,000	315,000 7,875,000
Reserves Line Strengthening	125,000 425,000	390,000 425,000	550,000 975,000	900,000 1,875,000	1,250,000 3,125,000	1,250,000 4,375,000	1,250,000 5,625,000	1,125,000 6,750,000	950,000 7,700,000	700,000 8,000,000	350,000 9,750,000
Earnings from Line Management		53,750 219,854	166,114 219,854	359,029 578,892	659,946 1,239,838	1,047,134 2,135,492	1,357,724 3,493,155	1,412,529 4,905,725	1,324,923 6,231,749	1,054,186 7,285,934	554,354 7,843,490

Prepared by Enrique Castellon, Credit Component of Proriego

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TERMS OF REFERENCE OF THE SUPPLEMENTARY TECHNICAL ASSISTANCEAGRONOMICAL ENGINEER SPECIALIZED IN THE PREPARATION OF IRRIGATION PROJECTS

To assist the regional teams in the formulation and design of the irrigation subprojects, offering criteria, methodology and focussing. Also, to assist the technical assistance team leader in the overall review of the feasibility studies prepared by the Regional Offices. (2 years)

AGRONOMICAL ENGINEER SPECIALIZED IN AGRICULTURAL PRODUCTION UNDER IRRIGATION

To continue the work of the foreign specialist who preceded him. Assist the regional teams with the preparation of agricultural plans of the subprojects and to prepare the guidelines and model technical packages, adapted to the regional conditions. (1 year)

SPECIALIST IN WATER MANAGEMENT ON FARMS

To assist the regional teams with the water management plans on the farms or subprojects, to prepare the respective guidelines and technical packages, and to train the farmers. (2 years)

SPECIALIST IN THE CONSTRUCTION OF HYDRAULIC WORKS

To review the construction standards employed by each Regional Office; to review the designs; to visit the constructed works, and to assist the regional teams with the preparation of the construction specifications for each subproject. He must focus his advice on the efficient use of the local means and resources and he shall present written outlines whenever necessary. (6 months)

SPECIALIST IN HYDRAULIC RESOURCES MANAGEMENT

To assist the DGRH, jointly with the Management and Administration Specialist and the local Hydraulic Resources Management Specialist, in the definition of the objectives of the DGRH, in the preparation of an annual work plan, in the review of the organizational structure and in the implementation of the Work Plan. His main objective shall be to provide technical expertise in hydraulic resources to complete the above described tasks, and to prepare the Master Plan. (3 years)

MANAGEMENT AND ADMINISTRATION SPECIALIST

To assist the DGRH, jointly with the foreign and domestic Hydraulic Resources Management Specialists, in the definition of the objectives of the DGRH, in the preparation of an annual work plan, in the review of the organizational structure and in the

implementation of the Work Plan. His main objective shall be to provide administrative experience for the preparation of the above mentioned tasks. (3 months)

SPECIALIST IN PROMOTION, EXTENSION AND TRAINING

To assist in the promotion of the Project regarding irrigation and credits; to organize and supervise the extension service of Project in collaboration with the Extension Service of the Direction General of Agriculture; to organize and supervise the training of the professionals, technicians and farmers. (2 years)
Observation: The services of the previous foreign consultant could be used.

FARM MANAGEMENT SPECIALIST

To assist the farmers with the organization of production and accounting records systems; and to train the farmers in the use and keeping of records. (2 years).

SPECIALIST IN COMMERCIAL BANK CREDITS

To assist the Project in the operation of its credit system with the commercial banks, and to establish stable relations of the commercial banks with the customers of the Project. (1 year)
Observation: It would be possible to continue with the consulting services of the current specialist.

SPECIALIST IN HYDRAULIC RESOURCES MANAGEMENT

To assist the DGRH, jointly with the specialist in Management and Administration and the foreign consultant in hydraulic resources management, in the definition of the objectives of the DGRH, in the preparation of an annual Work Plan, in the review of the organizational structure, and in the implementation of the Work Plan. His main objective shall be to provide technical expertise in hydraulic resources to complete the above described tasks and to prepare the Master Plan. (3 months)