UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D. C. 20523

HONDURAS

# PROJECT PAPER

RURAL ROADS II

AID/LAC/P-233

Loan Number:522-T-052
Projct Number:522-0214

AGENCY FOR INTERNATIONAL DEVELOPMENT

# PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete)

Amendment Number:

DOCUMENT CODE: 3

COUNTRY/ENTITY: HONDURAS

3. PROJECT NUMBER: 522-0214

4. BUREAU/OFFICE: LAC

5. PROJECT TITLE (maximum 40 characters): RURAL ROADS II

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 07 DD 01 YY 89

7. ESTIMATED DATE OF OBLIGATION (Under "B." below, enter 1, 2, 3, or 4)

A. Initial FY 85 B. Quarter 3 C. Final FY 89

8. COSTS ($000 OR EQUIVALENT $1 = )

| A. FUNDING SOURCE | FIRST FY 85 B. FX | C. L/C | D. Total | LIFE OF PROJECT E. FX | F. L/C | G. Total |
|---|---|---|---|---|---|---|
| AID Appropriated Total | 3,485 | 2,015 | 5,500 | 4,600 | 15,400 | 20,000 |
| (Grant) | ( 200 ) | ( ) | ( 200 ) | ( 1,315 ) | ( ) | ( 1,315 ) |
| (Loan) | ( 3,285 ) | ( 2,015 ) | ( 5,300 ) | ( 3,285 ) | ( 15,400 ) | ( 18,685 ) |
| Other U.S. 1. | | | | | | |
| Other U.S. 2. | | | | | | |
| Host Country | | | | | 14,852 | 14,852 |
| Other Donor(s) | | | | | | |
| TOTALS | 3,485 | 2,015 | 5,500 | 4,600 | 30,252 | 34,852 |

9. SCHEDULE OF AID FUNDING ($000)

| A. APPROPRIATION | B. PRIMARY PURPOSE CODE | C. PRIMARY TECH. CODE 1. Grant | 2. Loan | D. OBLIGATIONS TO DATE 1. Grant | 2. Loan | E. AMOUNT APPROVED THIS ACTION 1. Grant | 2. Loan | F. LIFE OF PROJECT 1. Grant | 2. Loan |
|---|---|---|---|---|---|---|---|---|---|
| (1) ARDN | 250 | 060 | 060 | | | 200 | 5,300 | 1,315 | 18,685 |
| (2) | | | | | | | | | |
| (3) | | | | | | | | | |
| (4) | | | | | | | | | |
| TOTALS | | | | | | 200 | 5,300 | 1,315 | 18,685 |

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): 010 070

11. SECONDARY PURPOSE CODE:

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code:

B. Amount:

13. PROJECT PURPOSE (maximum 480 characters)

Institutionalization of rural roads rehabilitation and maintenance capacity within the proper GOH entities.

14. SCHEDULED EVALUATIONS

Interim MM 06 YY 86 MM 06 YY 87 Final MM 07 YY 89

15. SOURCE/ORIGIN OF GOODS AND SERVICES

[X] 000 [X] 941 [X] Local [ ] Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a ____ page PP Amendment.)

17. APPROVED BY

Signature:

Title: Carl H. Leonard
Acting Mission Director
USAID/Honduras

Date Signed: MM 07 DD 01 YY 85

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION

MM DD YY

PROJECT AUTHORIZATION

Name of Country: Honduras

Name of Project: Rural Roads II

Number of Project: 522-0214
Loan Number : 522-T-052

I. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Rural Roads II Project for the Republic of Honduras ("the Cooperating Country") involving planned obligations of not to exceed Eighteen Million, Six Hundred Eighty Five Thousand United States Dollars (US$18,685,000) in Loan funds ("Loan") and One Million, Three Hundred Fifteen Thousand United States Dollars (US$1,315,000) in Grant funds ("Grant") over a four-year period from the date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/Allotment process, to help in financing foreign exchange and local currency costs for the Project.

II. The Project consists of a rural access roads rehabilitation and maintenance initiative to be administered by the Cooperating Country. The Project will be implemented by the Honduran Ministry of Communications and Transportation (SECOPT). It is anticipated that by the PACD approximately 1,000 kilometers of rural roads will be rehabilitated. Road maintenance activities will be implemented under the Project and managed by SECOPT. Beneficiary communities will provide hand labor for this maintenance. Individuals contracted from the communities will be paid by SECOPT.

Funds will be made available to purchase spare parts for equipment used by local contractors. In addition, Project funds will be used for the purchase of vehicles, contracting for technical assistance through both PSCs and PASAs, on-going training for host country personnel, construction of up to four SECOPT regional offices and the contracting of local firms to implement road rehabilitation in three geographic regions of Honduras. Two evaluations will also be undertaken during the Project.

III. The Project Agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

1. Interest Rate and Terms of Repayment

The Cooperating Country shall repay the Loan to A.I.D. in U.S. Dollars within forty (40) years from the date of first disbursement of the Loan, including a grace period of not to exceed ten (10) years. The Cooperating Country shall pay to A.I.D. in U.S. Dollars

interest from the date of first disbursement of the Loan at the rate of (i) two percent (2%) per annum during the first ten (10) years, and (ii) three percent (3%) per annum thereafter on the outstanding disbursed balance of the Loan and on any due and unpaid interest accrued thereon.

2. Source and Origin of Goods and Services (Loan)

Goods and services, except for ocean shipping, financed by A.I.D. under the Loan shall have their source and origin or nationality in Code 941 countries, and Honduras, or in the case of vehicles, Code 000 of the A.I.D. Geographic Code Book in effect at the time orders are placed or contracts entered into for such goods and services, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Loan shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States or the Central American Common Market.

3. Source and Origin of Goods and Services (Grant)

Goods and services, except for ocean shipping, financed by A.I.D. under the Grant shall have their source and origin in the United States, Honduras, or countries of the Central America common market, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D under the Grant shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States.

4. Conditions Precedent to Initial Disbursement

Prior to any disbursement or the issuance of any commitment document under the Project Agreement to finance Technical Assistance, the Cooperating Country shall furnish, in form and substance satisfactory to A.I.D.:

a. An opinion of Counsel acceptable to A.I.D. that this Agreement has been duly authorized and/or ratified by, and executed on behalf of, the Borrower/Grantee and that it constitutes a valid and legally binding obligation of the Borrower/Grantee in accordance with all its terms.

b. A statement of the names of the persons holding or acting in the office of the Borrower/Grantee specified in Section 9.c, and a specimen signature of each person specified in such statement.

5. Conditions Precedent to Additional Disbursements

Prior to any further disbursements or the issuance of any committment documents under the Project Agreement to finance Project Activities, other than technical assistance, the Cooperating Country shall furnish in form and substance satisfactory to A.I.D.:

a. Evidence that it has developed a design and construction manual for roads to be rehabilitated under the Project.

b. Evidence that it has developed a process of road selection based on sound economic, social and evironmental analyses as determined jointly with A.I.D.

c. A Maintenance Management Plan for all roads to be rehabilitated under this Project and the Rural Trails and Access Roads (522-0164) predecesor Project. This Plan will:

1) Indicate that the Cooperating Country has established a maintenance budget which includes approximately the Lempira equivalent of $800.00 per kilometer per year, with a commitment to make appropriate adjustment for inflation for future years. A portion of these funds will be used to pay individuals in beneficiary communities for hand labor maintenance.

2) Establish a system to evaluate, through SECOPT, the rural roads maintenance system on a regular basis and establish alternative maintenance procedures for the roads in the event that rural communities do not provide regular effective maintenance service.

3) Include all access roads rehabilitated under this Project and the predecessor Project in the system of roads maintained by the Directorate General of Maintenance of SECOPT, provide that they will be maintained on a regular basis and ensure that maintenance supervisory services will be provided to rural communities which participate in the maintenance of rural roads.

4) Include a budget plan for the provision of the Lempira equivalent of not less than Eight Million Three Hundred Sixty Six Thousand United States Dollars ($8,366,000) as the GOH financial contribution to the Maintenance component of the Project.

6. Project Evaluation

Except as the Parties otherwise agree in writing, the program will include, during the implementation of the Project and at one or more points thereafter: (a) evaluation of progress toward attainment of the objectives of the Project; (b) identification and evaluation of problem areas or constraints which may inhibit such attainment; (c) assessment of how such information may be used to help overcome such problems; and (d) evaluation, to the degree feasible, of the overall development impact of the Project.

7. Special Covenants

The Borrower/Grantee further covenants and agrees as follows:

(a) That it will cause to be established a mechanism for the Project implementation unit and maintenance personnel to receive their salaries punctually.

(b) That it will designate certain specific equipment only for rural road maintenance rehabilitation.

(c) That SECOPT/DGC will increase its staff and logistical support in a manner which will permit the Project and other operations to be carried out efficiently and expeditiously in three regions simultaneously.

(d) That it will establish a revolving petty cash fund, in an amount not less than the Lempira equivalent of US Dollars $500.00 for each of the existing Regional Centers, to be replenished monthly.

(e) That it will provide quarterly, in form and substance satisfactory to A.I.D., a report describing the construction, maintenance and financial status of all Project roads.

(f) That it will in conformance with its financial resources budget the necessary funds for the maintenance and rehabilitation of rural roads under this Project and the predecessor project.

(g) That it will, after the PACD, continue to provide maintenance services for these roads and will continue to provide a field supervisor from the General Directorate of Maintenance (DG) to advise rural communities with respect to the maintenance requirements of these roads.

Carl H. Leonard
Acting Mission Director

Date: July 1, 1985

TABLE OF CONTENTS


| | | Page No. |
|---|---|---|
| I. | SUMMARY AND RECOMMENDATIONS | |
| | A. Summary | 1 |
| | B. Recommendations | 2 |
| | C. PP Development Team | 2 |
| II. | PROGRAM FACTORS | |
| | A. Economic Setting | 2-3 |
| | B. Relationship to USAID Country Strategy | 4 |
| | C. GOH National Development Plan and Goals | 5 |
| | D. Other Donor Activities | 5-6 |
| III. | PROJECT DESCRIPTION | |
| | A. The Problem | 6 |
| | B. Background | 7 |
| | C. Project Goal and Purpose | 7-8 |
| | D. Project Components | 8 |
| | 1. Construction Activities | 8 |
| | a. Construction Strategy | 8-10 |
| | b. Construction Contracting | 10-11 |
| | 2. Road Maintenance | 11 |
| | a. Strategy and Role of DGM | 11-13 |
| | b. Role of Area Maintenance Engineer | 14 |
| | c. Role of Social Promotor | 14 |
| | d. Role of Community Organizations | 15-18 |
| | e. Spare Parts for Machinery | 18 |
| | 3. Project Administration | 18-19 |
| | a. SECOPT | 19 |
| | b. Dirección General de Caminos - Regional Field Offices | 19 |
| | c. Dirección General de Mantenimiento | 20 |
| | d. Communities | 20 |
| | 4. Subproject Selection Process | 20 |
| | a. Road Selection Committee | 20 |
| | b. Technical Analysis Selection Unit (TASU) | 20 |
| | c. Policy Selection Unit | 21 |
| | E. End of Project Status | 21 |
| | F. Project Inputs | 22 |
| | 1. Road Construction | 22 |
| | 2. Training | 22-23 |
| | 3. Technical Assistance | 23 |
| | 4. Commodities | 23 |
| | a. Vehicles | 23 |
| | b. Office Equipment | 24 |
| | c. Tools/Equipment for Hand Labor Maintenance | 24 |

IV. PROJECT ANALYSIS 24

A. Financial Analysis 24
1. Financial Plan 24-29
2. Project Disbursement System 30

B. Economic Analysis 30
1. Benefits Resulting from Road Improvement 30-31
2. The Importance of the Availability of other Inputs and Services 31
3. Benefits Anticipated and Quantified for this Project 32
a. Increased Farm Gate Prices 32
b. Increased Production 32
4. Benefits Not Quantified 32
5. Results on Previous Road Project Evaluations 32-33
6. The Effect on the Anticipated Changes in Basic Grain Farm Gate Price, and Yields of Farm Income 33-36
7. Impact on the National Economy 37

C. Technical Analysis 37
1. Access Roads - Labor Intensive Methods 37-38
2. Road Design - Standards 38-39
3. Maintenance 39-40
4. Construction Costs 40-41
5. Improvement of Transportation Modes 41-42
6. Engineering Conclusions 42

D. Contractual Arrangements 42-44
1. Plans and Specifications 44
2. Access Road Construction Manual 44-45
3. Road Selection Stages 45-46

E. Administrative/Institutional Analysis 46
1. Division of Highways (DGC) 46
a. Organization 46-47
b. Experience with External Financing 47
c. Management Capability 47-49
2. Division of Maintenance (DGM) 49
a. Brief History 49
b. Experience with External Financing 49-50
c. Management Capability 50

F. Social Considerations 50-51
1. Community Participation in the Preventive Maintenance of Roads Reconstructed 51-54

G. Environmental Analysis 54-55
1. The Environmental Review Process 55
2. The Environmental Review Document and Its Use 55-56

V. A.I.D. MONITORING 56

VI. IMPLEMENTATION PLAN 57

1. Schedule of Major Events 57

VII. PROCUREMENT PLAN 59

VIII. EVALUATION PLAN 59-60

IX. CONDITIONS, COVENANTS AND NEGOTIATING STATUS 60

1. Conditions Precedent to Initial Disbursement 60
2. Conditions Precedent to Disbursement for Equipment Procurement 60-61
3. Conditions Precedent to Subsequent Disbursements
4. Covenants 61
5. Negotiating Status 61

1

Project Paper
Honduras: Rural Roads II
(Project No. 522-0214)

# I. SUMMARY AND RECOMMENDATIONS

## A. Summary

The purpose of the Project is to expand by 1,000 kilometers, and properly maintain, the all weather rural road network in Honduras. The Project will be implemented by the A.I.D. Implementation Unit (A.I.U.) of the Honduran Ministry of Communications, Public Works and Transport (SECOPT). The A.I.U. will develop the construction schedule, design and analyze plans for construction packages, review proposals and award construction contracts and monitor overall progress of the Project. All construction activity will be carried out by private Honduran contractors. To participate in the program, contractors will submit proposal responses to bid requests issued by SECOPT. The bid documents as well as the selection process will conform to A.I.D. regulations. The firms awarded construction contracts will provide the machinery and work crews necessary to accomplish the assigned tasks.

Road upgrading, using a combined heavy equipment-hand labor technology, will be carried out simultaneously in three geographic regions which are critical to Honduras' development and which are focal points of A.I.D. assistance -- (1) North Coast, (2) the Central Valleys and (3) the Western Highlands. Within each region, construction will be executed on a phased basis. All road segments which meet a set of pre-determined criteria will be grouped into construction packages of approximately 20 kilometers. The packages will be rank ordered according to their economic and social impact on the region and work on the highest ranked packages will begin first. Lower ranking sets will receive subsequent attention.

Rural Road Maintenance will be carried out as a separate activity within the General Directorate of Maintenance (DGM). Minor organizational changes will be made within SECOPT, which manages the DGM, in order to effectively address the area of rural road maintenance under this Project. The new rural road maintenance activity will be separated from primary and secondary highway maintenance in order to facilitate local participation and encourage DGM responsiveness to local community needs.

The beneficiaries of the Project will be approximately 50,000 rural Honduran households, the wide majority of which are small farmers, residing in the target areas. They will receive the benefits of enhanced access to markets, agricultural inputs and social services which, in turn, will contribute to increased incomes and an improved quality of life.

The Project will last four years. The total projected cost is $34.852 million. The A.I.D. contribution will be $20 million; $18.685 million in loan funds and $1.315 million in grant funds. This will be complemented by a $14.852 million GOH contribution.

B. Recommendations

The Project is being modeled on the highly successful Rural Roads I effort. The Mission judges that the refinements in the Rural Roads I methodology proposed in this Project are appropriate for furthering and enhancing accomplishments achieved to date in addressing a critical constraint to Honduran development. Accordingly, USAID/Honduras Project Design Committee recommends that the PP be approved.

C. PP Development Team

1. The USAID/Honduras PP Development Team was composed of:

   Peter F. Kranstover, Office of Development Finance
   Carl Maxwell, Office of Engineering
   Ben Severn, LAC/DR AID/W
   Orlando Hernández, Mission Social Scientist
   Guillermo Fú, Office of Mission Controller
   Anne del Castillo, Office of Rural Development

2. The following Honduran officials were consulted in developing the PP.

   Edwin R. Leiva, Director of Highways, GOH
   Carlos Cárcamo, Chief, A.I.U., SECOPT
   Miguel Morazán, Director of Maintenance, SECOPT

3. The PP was reviewed by the following USAID/Honduras officers:

   Carl H. Leonard, Deputy Mission Director
   Phillip R. Amos, Mission Controller
   Betty Facey, Chief, Office of Engineering
   William G. Kaschak, Chief, Office of Development Finance

II. PROGRAM FACTORS

A. Economic Setting

Honduras is, by almost every economic measurement, the poorest country in Latin America. In 1981 the per capita GDP was estimated at $675. However, the country's real GDP growth rate has been in decline, dropping from an average of 7 percent per annum in the late 1970's to a negative rate of over one percent annually in each of the last three years. Average real per capita income has dropped by almost 14 percent since 1981. Hardest hit by the slide of the economy are 2.6 million (60 percent of the entire population) Hondurans, the majority of whom are peasant farmers. It is estimated that more than 80 percent of this group had earnings below the calculated poverty line income of $230 per capita.

Honduras' poverty is reflected in key social indicators associated with underdevelopment. The human resource base is extremely weak. The literacy rate for the adult population is 60 percent, and only 20 percent of the rural population over 14 years of age is capable of reading and writing. While recent A.I.D. and other donor assistance has made progress on the deficient physical infrastructure component of the educational system, further efforts are required to improve the quality of formal training. For example, in rural primary schools only 49 percent of first graders pass on to the second year. Performance in the urban area is only slightly better.

The situation is similar in the health sector where generally poor health status continues to limit the productivity, earning power and quality of life of the Honduran populace. Malnutrition, particularly protein deficiencies, affects 70 percent of the population. Diarrhea, followed closely by respiratory and vector borne diseases (especially malaria) are the principal causes of mortality among all age groups. In combination, these and other factors contribute to a comparatively high infant mortality rate (77 per 1,000 live births compared to 55 per 1,000 live births in Mexico) and a life expectancy of 57 years. Substandard environmental sanitation conditions complicate the ability of the Honduran government to respond to the existing health problems. At least 45 percent of the population are without access to potable water resulting in the persistence of active disease transmission despite aggressive immunization and vector control programs. In sum, owing to unsanitary home environments, deficient health education and limited access to health services, many preventable health problems become chronic illnesses.

The GOH has taken some initial measures to resolve the country's current economic difficulties and develop a new growth strategy. In 1981, taxes were raised and tax administration improvements are underway with A.I.D. funded assistance. The Central Government budget has been held constant over the last three years and an initiative has been launched to balance the budgets of autonomous agencies. New incentives have been approved to promote increased exports and a revision of investment incentives and tariff legislation is under consideration with the goal of developing a more competitive production and export base. Finally, a joint GOH/USG Economic Working Group (JEWG) has been established to analyze the country's economic situation and recommend policies that will promote short term economic stabilization and establish the base for sustained growth in the long term.

Despite these positive initial steps, prospects for economic revival and a continuation of the democratic process are directly tied to the GOH's capacity to broaden the participation of all social sectors in economic growth. This will entail designing policies that will facilitate the desired expansion and implementating sector specific programs to assure that its benefits are distributed equitably. The combination of policies and programs must, in the long term, reduce unemployment, provide for a minimum level of food security and strengthen the public and private services to better meet the basic human needs of the poor.

B. Relationship to USAID Country Strategy

The USAID country strategy is designed to support Honduras' development goals. Over the long-term our objectives are to foster economic stabilization and promote growth with equity to improve the standard of living of the country's poor. Economic stabilization will be brought about through GOH implementation of important macro-economic policies to correct the existing disequilibria while simultaneously creating a sound basis for a long-term export oriented expansion strategy. To this end, the Mission, through the JEWG, is providing support to develop policies that enhance revenue, control spending, foreign exchange rate regulations and a reduction of the money supply through increased bank reserve requirements.

The Mission's strategy for improving the standard of living of the Honduran poor consists of a multifaceted program of addressing a linked series of sectoral specific problems. In the agricultural sector concerted efforts will be made to improve the marketing system for farm commodities, enhance research activities and facilitate farmer access to the inputs needed to stimulate production increases. Initiatives in education and health fields will center on improving the quantity and quality of services available to marginal segments of the society. Interventions channelled through the private sector will provide credit and technical assistance to stimulate business development and penetrate international markets for Honduran agricultural and private sector products.

The Rural Roads II Project will support the achievement of our sectoral objectives. An expanded network of all weather rural secondary roads and trails will facilitate farmer participation in the marketing system by both easing the arrival of needed inputs to increase production at the farm gate and the delivery of produce to the points of sale, thereby contributing to increased farmer income. Input and product marketing structures are for the most part, poorly developed and transportation is often erratic and expensive. This has not only contributed to relatively high transportation costs but has also exaccerbated the problem of post harvest losses. As the Mission's 1986-1990 CDSS recognizes, although some investment has been made in productive infrastructure such as roads, drainage and irrigation; it has not been enough. This lack of appropriate infrastucture is a major constraint to the development of the agriculture sector and to the further integration of small farmers into the market economy. Similarly, improved roads will facilitate the delivery of enhanced health and educational services to the rural poor. Finally, by improving the involvement of the rural poor in sector specific initiatives, an upgraded road network contributes to the long term goal of increasing the participation of marginal groups in the country's development process.

The proposed Project conforms to the Kissinger Commission Report and Jackson Plan concerning infrastructure, and A.I.D. Policy Determinations on Physical Infrastructure, Private Enterprise Development, Institutional Development and Employment and Income Distribution. The Project supports the objectives of

section 103 (b) (1) of the FAA to expand rural infrastructure and utilities. As recommended in the Kissinger Report, and Jackson Plan, the Project proposes to alleviate a pressing infrastructure constraint in the country by upgrading and maintaining roads through host country institutions and community participation. Also, as stated in the Physical Infrastructure Policy Determination, the Project will concentrate on feeder roads which are inexpensive, contribute substantially to the social-economic benefit of the country's poor and support initiatives in other priority sectors (e.g. health, agriculture and education). In consonnance with the A.I.D. Private Enterprise Policy Paper, the Project will contribute to the development of host country business by contracting Honduran firms to carry out the road rehabilitation and upgrading tasks. In addition, it will support other Honduran firms which will be the suppliers of needed machinery, spare parts, hand tools and materials (e.g. cement, reinforcing bar). In compliance with the A.I.D. Policy on Institutional Development, Project funds will be used to refine the management skills of SECOPT administrators and the technical skills of the Ministry's engineers through formal short term training courses. In this way, SECOPT will develop and maintain a cadre of professionals capable of responding to the feeder road infrastructure needs of the country. Finally, in conformance with the Employment and Income Distribution Policy, the Project, through contracts with private sector firms, will generate approximately 20,000 person months of employment over its four year life. The majority of this employment, as much as 60 percent, will be for manual laborers drawn from among the country's poor majority. Through the creation of these jobs, the Project will be contributing directly to the GOH's "first offensive" in combating unemployment.

C. GOH National Development Plan and Goals

As recognized by the GOH in their National Development Plan for 1982 through 1986, the need to provide improved infrastructure access by means of a broadening and improvement of tertiary roads throughout the country is an integral part of their overall development strategy. As stated in their plan, the financial needs of basic services, such as transport "will receive priority attention when such services are oriented toward the realization of productive activities and support general social development." Furthermore, use of an appropriate mix of labor intensive and mechanical methods for road construction and maintenance are emphasized in the plan, thereby complementing the intended strategy for this Project.

D. Other Donor Activities

Several international donors are either currently involved or are planning to become involved in the near future in alleviating Honduras' road network problem. The World Bank is implementing a $5.1 million primary road and bridge construction effort in selected valley regions in the Department of Olancho that will be completed in mid 1986. The Inter-American Development Bank (IDB) is planning to initiate, in 1985, a three year effort to construct approximately 327 kilometers of rural access roads in selected valley areas

(eg. Departments of Olancho and Yoro) and a 123 Km. paved highway Project connecting the cities of La Ceiba, Jutiapa, Sabá and Olanchito. In addition, the Swiss Development Agency (COSUDE), the European Economic Community (EEC) and the Central American Bank for Economic Integration (CABEI) are participating in building new secondary roads.

This proposed A.I.D. financed Project will be complementary to, and not duplicative of, the other international donor funded activities. The A.I.D. funded activities will focus on tertiary access roads and trails, whereas other donors are concentrating on paved major highways and primary rural routes. Moreover, the geographic areas selected for the concentration of A.I.D. resources will be distinct from those in which other donor financing is being applied. The World Bank and the IBD, as noted above, are concentrating respectively in Olancho and the Yoro valleys. The Swiss are focussed on La Paz, while the ECC and CABEI are working in Yoro and Santa Barbara. A.I.D. resources will be channeled toward roads or trails in the areas not covered by these initiatives. The proposed Project will complement other donor efforts in a third sense. Whereas all the other donor initiatives are directed towards new routes, the A.I.D. effort will focus on rehabilitating and upgrading existing roads and trails to all weather standards. A list of roads currently being maintained and/or constructed by other international development institutions is listed in Annex C.

## III. PROJECT DESCRIPTION

### A. The Problem

Despite past and on-going access road-initiatives, a deficient road network persists in the Honduran countryside and the rural sector. This is at least partially explained by the fact that the GOH has traditionally favored the construction of paved primary routes over secondary or tertiary access roads of lower standards. At this time however, and based on recent past experience, most notably under the Rural Roads and Trails Access Project, a new effort as described in this Project Paper is appropriate. This rationale derives from: Estimates that, on a countrywide basis, over 5000 kms of access routes affecting over 800,000 people, are in substandard states of repair. In all geographic regions of the country, significant numbers of the rural population are obliged to use narrow, eroded trails to gain access to the closest market and social services center, or in some cases the nearest all-weather road. Continual heavy use has rendered the feeder roads vulnerable to extreme erosion making travel slow and hazardous at all times of the year and, in many instances, impossible during the six month (June - November) rainy season. As a result, the delivery of basic services (e.g. health care, education) is restricted as is the availability of inputs necessary to enhance agricultural productivity.

B. Background

In the recent past, A.I.D. and the GOH have collaborated on four feeder road Projects. Under the Agricultural Sector I Project (522-T-025), which began in 1975, over 300 kilometers of access roads were constructed to service small farmer cooperatives located in various regions of the country. Subsequently, starting in 1976, approximately 300 kilometers of access roads were rehabilitated under the Rural Reconstruction II Project (522-T-030) designed and implemented in response to the damage caused by Hurricane Fifi. In 1978, a Rural Trails Project was designed to construct 165 kilometers of earthen trails in the mountainous regions of Central Honduras (e.g. Santa Barbara). Finally, the Rural Trails and Access Roads I Project, obligated in 1980 and amended in 1983, was developed to upgrade to all weather standards over 1500 kms of tertiary rural routes in regions of high agricultural potential. Road construction under this Project was originally begun in the Western part of Honduras, a densely populated poorer area of the country. The success of Rural Trails and Access Roads Project as well as the appropriateness of the type of construction undertaken in that Project provides at least part of the rationale for replicating similar activities in other parts of the country. As of March 31, 1985 almost 1400 kms, 91 percent of all construction activity is either completed or in progress; the balance is scheduled for completion in FY86.

The sum of these efforts has been the construction and upgrading of more than 2000 kms of rural access roads and trails in a 10 year period. All four efforts have been administered by SECOPT and executed either by force account or through subcontracts with local construction firms. Moreover, taken as a whole the projects have employed a continuum of technologies, ranging from exclusive use of hand labor to an almost complete reliance on heavy equipment. In the process, SECOPT has gained relevant experience in project management and extensive expertise in carrying out the planning, design and construction of rural secondary and tertiary routes with a variety of technological mixes. Involvement with A.I.D. projects also has provided SECOPT with expertise in road construction in all terrains as well as design standards, bridge and drainage structures design, evaluation methodologies and community organization strategies relative to beneficiary participation in road construction and maintenance activities. Finally, participation in prior A.I.D. initiatives has enabled SECOPT to become familiar with A.I.D. disbursement and accounting procedures -- especially those related to subproject contract financing. This Project is designed to take advantage of the experience gained through previous efforts.

C. Project Goal and Purpose

The Project Goal is to assist the GOH in its efforts to increase the income of, and delivery of social and technical services to rural dwellers, especially small farmers. The Project Purpose is the institutionalization of a rural roads rehabilitation and maintenance capacity within the proper GOH entities. This will result in the expansion and maintenance of the all-weather rural road network in the country by 1,000 kilometers and ensure the

proper maintenance of 1,500 kilometers of access trails and roads reconstructed under Rural Roads I. The Goal and Purpose are linked by a series of assumptions.

The most important of these is that Honduras will continue on a democratic path. Critical ancillary assumptions include: (1) the persistence of growth with equity as a key GOH policy and, (2) the timely availability of laborers, construction firm contractors and community volunteers to assist in road improvement and maintenance.

This Project will build upon the knowledge gained during the implementation of the Rural Trails and Access Roads I effort. As such, it also assumes that the implementation of the Rural Trails and Access Roads I has served to institutionalize a concern for a stable rural transportation system as a long term policy of the GOH's transport sector.

## D. Project Components

The Project will consist of two integrally related components: (1) the rehabilitation and upgrading of rural trails and roads including related bridges and drainage works, and, (2) the administration of these construction activities.

### 1. Construction Activities

#### a. Construction Strategy

Road/trail upgrading will be carried out simultaneously in three geographic regions (the North Coast, the Central Valleys and the Western Highlands) which are critical to the country's economic growth and which have been focal points of A.I.D. investment. For example, the North Coast and contiguous Sula Valley hold promise for expanded livestock raising and marketing as well as the development of fresh agricultural produce centers. An improved road network will enhance farmer access to markets and directly support A.I.D. initiatives in export promotion and agricultural research in this area. Upgraded roads in the Central Valleys will link naturally to on-going and future A.I.D. programs in agricultural technology transfer and marketing and back the delivery of social services provided by the Health Sector I and Primary Rural Education Projects. In the Western Highlands, an upgraded tertiary road network will not only facilitate small farmer access to basic social services (health and education) but also enhance farmer participation in A.I.D. sponsored cash crop (e.g. coffee and citrus) production, marketing and land titling efforts.

The quantity of kilometers rehabilitated will vary among regions and will be determined by the regions' land area, population density and relative importance to the country's economy. Preliminary lists have been developed of all potential road projects in each of the geographic regions and this process will continue throughout the initial stage of implementation.

This reconstruction or upgrading will be carried out in accordance with two established technical design options both of which are geared to minimize construction and maintenance costs. Option one will pertain to relatively high volume routes -- those which average daily traffic of between 20 to 100 vehicles a day. Minimum design standards for these types of roads will include conformation of existing subsurfaces that will be surfaced by 6 inches of compacted select borrow or gravel material. All necessary fills will be compacted as well. The minimum width will be 5.5 meters including shoulders. Grades will be rolled and follow existing land contours to reduce excavation and impact on the environment. Road crowns will range from 3 percent to 5 percent and cut slopes will vary from ratios of 1/4: to 2:1. Maximum allowable adverse grades will be 10 percent. Culverts, catchbasins and headwalls will be installed, as needed, as a part of the normal construction practice.

Option two will apply to low volume routes with a traffic flow of less than 20 vehicles a day. Minimum technical criteria for these routes will be a width of 4 meters with turn-outs and curve widening as appropriate to permit passing. The subgrade and surface requirements, as well as vertical and horizontal alignment will be the same as those used for the 5.5 meter roads. One exception will be the use of drainage dip sections (rock or concrete fords) in place of culverts where appropriate.

Experience gained from previous rural road initiatives, as well as preliminary investigations of potential Project sites, indicate that bridge and drainage work construction is necessary to retard roadbed deterioration and provide year-round access of beneficiaries to marketing and social services centers. Accordingly, the Project will finance up to 400 linear meters of bridges, plus major culverts and retaining walls. Road selection criteria will be used in selecting bridge and culvert sites and will include: population of the area, average daily traffic, number of kilometers linked by the structure, time delay and the productive potential of the zone. Bridge length will be determined by stream width, but normally will not exceed 20 meters. Design standards will emphasize load capacity and width sufficient to accomodate critical vehicles (agricultural produce hauling trucks). The span and height of structures will allow unobstructed water flow during peak run-off periods and piers will be sufficiently deep to avoid river scouring and undercutting of footings. To the extent possible local materials (e.g. stone, sand, gravel) will be used in construction to reduce costs. It is anticipated that local materials also will be used extensively in the building of bridges and headwalls. An Access Road Design Standards and Specifications Manual will be a Condition Precedent to the disbursement of funds.

During project implementation, site visits will be carried out to determine which of the potential subprojects meets a series of basic eligibility criteria that will include: (1) minimally acceptable population density, (2) availability of manual laborers, (3) per capita income (4) agricultural potential of the area, (5) transportation costs of farm commodities. Acceptable segments that meet the criteria will be grouped into subproject

packages of approximately 20 kilometers each, and ranked by order of priority on the basis of the economic potential of the areas to be benefitted by road upgrading. The road segments in the highest ranked packages will be addressed first while lower ranking packages will receive subsequent attention.

In order to ensure proper Project implementation and assure consistent engineering monitoring, four sub-regional offices will be constructed in as yet to be selected sites in more remote regions of the Project area. Currently, SECOPT does not have structures in many of the outlying areas of the country, thus preventing it from establishing and maintaining a proper presence in the rural areas. These structures will serve not only as administrative units but will also provide an area for storage and light vehicle maintenance work. SECOPT will be responsible for purchasing land needed for these structures.

b. Construction Contracting

Utilizing the existing AID/SECOPT Implementation Unit (IU) and other support elements of the Division of Highways, this Project will improve 1,000 km of rural access roads in the areas of concentration. In all cases, existing roads will be upgraded to meet DGM minimum maintenance standards for all-weather roads, and will be included in the network of roads regularly maintained by that unit. Realignment will be kept to a minimum and limited to existing rights-of-way where possible. Each road improved under the Project will connect to an existing all-weather road and serve an area whose principal economic activity is agriculture.

Prior to the issuance of bids for construction activity, a complete set of analyses (economic, social, technical and environmental) will be undertaken. The analytical work will be carried out by DGC personnel -- particularly the IU with support as needed from other departments of the Directorate.

All construction activities will be implemented by private Honduran contractors. Experience under prior rural road upgrading programs using this contracting system has proven to USAID and GOH that local contractors have the capability to perform the required work and to do it in an efficient, cost effective fashion. To be eligible for participation in the program, firms must be formally registered with the Honduran Contractor Licensing Board and must submit proposal responses to competitive bid requests for construction packages issued by SECOPT in accordance with A.I.D. regulations. Contractors selected to execute construction packages will provide the machinery and work crews necessary for the tasks. They will carry out the work in accordance with plans developed by SECOPT and approved by A.I.D., and adhere to work schedules established in the contracts.

The contracts will consist of construction packages of approximately 20 kilometers of road. To achieve economies of scale with respect to the movement of machinery and the contracting of local hand laborers, the road segments constituting these packages will be to the extent possible, in

relatively close geographic proximity. A single contractor will be responsible for a given subproject.1/ However, it is anticipated that a given contractor may execute several contract packages at the same time. Moreover, it is anticipated that a minimum number of 4 subprojects will be on-going at any time in each of the 3 SECOPT regions of Honduras.

The IU and the local contractors under its supervision will be responsible for upgrading the roads using equipment, hand tools and materials provided in all cases by the contractor. The contractor will be responsible for hiring community labor to work on access road projects. The construction contract will include costs for rental equipment, construction materials, labor and unit cost drainage structures. Average cost per kilometer, including drainage works, is estimated to range between $15,000 to $17,000. About 20% of the cost will be for hand labor.

To adequately address construction site supervision requirements, the IU will hire five project engineers, three supervisory engineers and 14 administrative support personnel. Support personnel from the IU will be responsible for scheduling of construction activities; performance of subproject cost studies; economic, social and environmental analyses; preparation of construction bid documents; analysis and awarding of bids; and tracking of overall project progress and related costs. The IU will also contract over 200 other personnel, including inspectors, timekeepers, field accountants (bookkeepers) and secretaries, to provide field supervision and management of the construction contractors. Finally, the IU will provide field transportation for all of its personnel either with GOH owned or rented vehicles.

2. Road Maintenance

a. Strategy and Role of DGM

Overall maintenance of the rehabilitated roads will be the responsibility of SECOPT's General Directorate of Maintenance (DGM) and will be carried out through relevant components of the Directorate's existing organizational structure. The National Coordinating Office will develop a general maintenance management plan for the Project. This plan will include maintenance standards and procedures for road upkeep activities (e.g., roadbed repair, crown

---

1/ The term subproject denotes a group or cluster of rural trails/access roads in reasonable proximity to each other which are proposed for financing under the Project. Their construction is expected to be handled in one contract in order to allow the contractor to move equipment and laborers from one point to another within the subproject area in an expeditious, economical manner.

retention and slide removal), details on the assignment of personnel and equipment and work itinerary. The plan will be submitted to the Mission for review, and its acceptance by A.I.D. will be a Condition Precedent to Project disbursements.

The actual maintenance work will be supervised by the secondary road District Maintenance Units located in each of the three Project regions. These units will rely on community participation for actually carrying out road maintenance activities. During the initial phase of Project implementation the Units will prepare region specific maintenance plans in accordance with the general maintenance management plan submitted by the DGM to A.I.D. The Regional plans will emphasize preventive maintenance activities and contain a detailed work plan.

The maintenance component is ultimately a DGM responsibility but will be complemented by beneficiary participation. In order to insure this participation contracting of local maintenance with members of local "patronatos" will be implemented. The Project Agreement will stipulate that further disbursements to a given region will be withheld if maintenance is lagging on roads already upgraded under this Project.

Developing an organizational structure for effective Rural Road maintenance will require a minor organizational and operational change at the national and local (maintenance district) level. Rural Road Maintenance will be a separate category of maintenance within the DGM department. The new rural road maintenance category will be separate from primary and secondary highway maintenance to facilitate local participation and encourage DGM responsiveness to local community needs. The distribution of resources between national, regional and local levels for rural road maintenance represents an explicit decision by SECOPT. This strategy better optimizes the utilization of existing personnel and equipment under one rubric versus the creation of a separate entity that necessitates duplication of effort in personnel and equipment. The emphasis of rural road maintenance within DGM will require the additional services of three area maintenance engineers for the coordination and implementation of Rural Roads maintenance.

Generally speaking the plan places coordination and mobilization of DGM personnel and equipment at the Maintenance district level through the Area Project Maintenance Engineer. The Maintenance Engineer will provide planning and advice to the local communities participating in road maintenance. The local community leaders will control the mobilization of labor from their communities. The local maintenance districts will control application of district resources and aid in the supervision and training of local community work. The national level (DGM) will retain responsibilities for overall management and planning, administration, research and coordination. In all cases, DGM is the responsible and accountable agency once the roads are turned over from DGC. Thus, A.I.D. will look to DGM as its single point of contact on road maintenance.

DGM representatives have participated fully in the design of this Project. The roads contemplated herein are being taken into account in their planning for activities over the next four years and thereafter. The Mission is therefore confident that roads rehabilitated under this initiative will be maintained during and after the Project implementation period. The GOH will be asked to confirm its commitment to the maintenance of the additional roads by means of a convenant to the Project Agreement.

The DGM presently is responsible for maintaining approximately 2300 kms. of paved roads, 4700 kms of secondary roads and 3500 kms of tertiary roads. It provides major road maintenance (generally that which needs motorized equipment) and labor and equipment to clear landslides, repair washouts, and perform other maintenance activities.

During Project Design, discussions were held on the subject of other donors' infrastructure activities in Honduras to determine the impact of their efforts on the institutional capacity of the implementing agency, SECOPT. Of primary interest to the design of this Project was the status of the World Bank (IBRD) Maintenance Project. In the past, much of the difficulty in scheduling maintenance was the lack of operating equipment available to the DGM. The IBRD loan initiated in 1982, is financing maintenance equipment ($7.2 million) training and repair of existing maintenance equipment ($2.2. million), technical assistance and tools ($2.0 million) for SECOPT. Although SECOPT has the necessary maintenance equipment to maintain the country's entire road network, equipment utilization has shifted to heavy maintenance activities causing a lack of equipment availability on a timely basis for the rest of the road network. This trend will change and become more balanced during the implementation of Rural Roads II.

Another factor that will mitigate this problem is the planned acquisition of new maintenance equipment by the GOH. The GOH is in the process of legalizing a loan equivalent to 18.0 million U.S. dollars with Japan for financing the purchase of road maintenance equipment (e.g., loaders, graders, tractors, compactor, concrete mixers, dump trucks) and spare parts. This equipment will be on line by mid 1986 and will significantly improve SECOPT's maintenance capability.

During the intensive review A.I.D. officials, the Director of Highways and the Director of Maintenance elaborated a scheme for ensuring a more balanced approach to maintenance on all roads. SECOPT has agreed to and will provide a pool of equipment consisting of sufficient motorgraders, trucks, tractors, loaders, and compactors to be specifically assigned for maintenance of rural roads for the Rural Roads II Project. Appropriate Conditions Precedent will be incorporated into the Project Agreement in order to ensure that this equipment is used for rural road maintenance.

The cost for the replacement and/or repair of the maintenance equipment pool will be financed by DGM. A percentage of funds collected from highway tolls will be provided for this purpose and put into a special account. The highway tolls will be imposed in mid 1985 and are expected to gross $6.0 million annually.

b) Role of Area Maintenance Engineer

Three engineers with necessary logistic support will be assigned through the Project to DGM to implement simultaneously the Maintenance Management Plan in three geographic regions.

They will be initially involved in the social promotion aspects of the project, and as such will confirm commitment in writing from local leaders concerning the disposition of community residents to contribute, through manual labor, to road maintenance.

The maintenance engineer will work with the District Maintenance foreman in the development of the Road Area Maintenance Plan (RAMP). The road inventory and road condition survey from which the RAMP will be developed is the responsibility of the maintenance engineer. Once the RAMP is approved by the DGM, it will be the responsibility of the appropriate district to implement the plan. The maintenance engineer will monitor maintenance activities, provide training and refer problems to the proper level for resolution as they pertain to the implementation of the Area Maintenance Plan.

c) Role of Social Promotor

The social promoter will coordinate the road maintenance program with the communities and SECOPT (specifically, the DGM). SECOPT in turn, will provide an inspector from the Maintenance District Office along with a DGM Maintenance engineer to visit communities every three months to review the maintenance program. This process will require the DGM Inspector and the engineer to inspect roads, identify deficiencies, advise the communities and promoters of the work required and then, through the promoters ensure that the work required is carried out correctly. The social promoters will work with community maintenance committees (organized under the patronatos or by the mayors) to organize local labor forces to perform maintenance on the roads. At the direction of the DGM inspector and engineer, they will fill potholes, clean ditches and culverts, and remove rockslides and landslides, using tools purchased for the maintenance of the roads.

Prior to initiation of work, SECOPT will send a letter to the patronatos or village leaders notifying them of the intent to begin work and the need for a commitment from the community for future maintenance work. As mentioned, one of the criteria for selecting projects is evidence of a capable

community organization and further, a concrete indication of community commitment to the concept of regular road maintenance. After the receipt of the SECOPT letter, the social promoters will solicit the views of community leaders on the construction of a road in their area, advise them of the benefits and obligations arising therefrom, and if their response is positive, ask the community patronato to sign an agreement with SECOPT. This agreement will set forth the duties and obligations of both parties with respect to each other, and commit the community to the provision of labor for maintenance work using tools and technical advice provided by SECOPT. (See Annex G for a copy of the model agreement).

The social promotor will also inform and coordinate other social and technical services between the pertinent agencies in the country and the communities within the Project zone of influence. This implies a continuing role during Project life and thereafter.

d. Role of Community Organizations

The objective of the maintenance aspect of this project is participation by campesinos in maintenance efforts through organizations which they control. The project will rely upon the village Patronatos to organize and provide labor for maintenance. Communities will share routine maintenance responsibility with SECOPT either by providing labor voluntarily or on a contractual basis. The communities will be supported in this effort by a roving maintenance crew from each DGM District Unit. The Project will rely upon village patronatos to organize and provide labor for maintenance. Prior to initiating construction, social promotors will canvas these patronatos to discern the disposition of community residents to contribute to road maintenance through manual labor. Assuming a positive response, community leaders will enter into an agreement with the DGM pledging their participation in road maintenance. Following this, the DGM Project Maintenance Engineer will develop a maintenance work plan and schedule with assignment details that will form part of the agreement. Only patronatos currently active and viable and which have implemented community works will participate in the Project. This will not unduly restrict the scope of the Project. This strategy is based on the fact that the Honduran rural sector is characterized by a relatively well developed pattern of local organizations.

Experience demonstrates that rural road maintenance can be carried out by community members, and in fact, the popular disposition towards community works of this type is quite favorable. A.I.D. has worked on any number of Selected Development Activity (SDA) projects, and found community participation to be quite high on the whole. Consequently, the broad base of the maintenance system will rest on the Patronatos and the hand laborers, who will be responsible for daily routine maintenance on their assigned section or road. The social promoter and DGM maintenance engineer will provide Patronatos with briefings, promotional materials and opportunities to obtain information on the Project. Community organizations will enter into a formal

contract with DGM which will cover both the responsibilities of the community organization and DGM in carrying out the program in a specified area, normally about 5 kilometers from the community toward the next link in the road system.

The patronatos will be free to determine the distribution of work within the organization, providing that the contractual undertakings of the patronatos to the DGM are met. If they are not, it will be up to DGM to reassess its relationship with the community and provide the maintenance itself if that is what is required.

Laborers selected by the Patronato will be contracted and paid a monthly salary to maintain up to 5 kms. of rural road. The maintenance engineer will inspect the work biweekly and outline the tasks for the upcoming weeks. The maintenance workers tasks include the control of weeds and obstructions in ditches and drainages, filling and hand tamping of potholes, minor repairs to structures, cleaning culverts, catchbasins and ditches and redistribuiting the gravel on the road surface. To facilitate in the execution of these tasks, hand tools will be delivered to the selected maintenance workers when construction activities are initiated.

Twice annually, heavy equipment will be dispatched from the maintenance districts for scarification of the total or partial wearing surface, grading, compacting, repair of culverts, structures, headwalls, and the delivery of new surfacing materials.

Initially 1500 kilometers of roads from predecessor Project 0164 will be in need of maintenance. Thereafter the number of kilometers of maintenance will increase by 250 kilometers per year over the life of Project for an eventual total of 2500 kilometers of roads needing maintenance. The nominal cost per kilometer per year to provide the ordinary/routine maintenance by hand labor is $200/km/year. This figure is based on contracting one man for every four (4) kilometers of road and paying him the minimum salary, equivalent to three (3) dollars per day working 265 days per year.

1. Routine Maintenance

For the Routine Maintenance program, supervisors will work out of the Regional Centers monitoring an average of 35 km/day, with visits scheduled twice monthly to each community maintenance worker (obrero). The number of supervisors per region depends upon the number of kilometers assigned to a specific region. In general, each supervisor can cover 300 kms. twice a month.

Since extensive engineering knowledge is not a prerequisite for the routine maintenance supervisors, the regional trainer will train persons with practical knowledge of road construction as supervisors. Supervisors must be from the region in which they are to work. The supervisor will review the work accomplished by each worker or "Obrero," outline a work schedule for the next 2 weeks, sign a timecard, and deliver the obrero's paycheck each month.

Candidates for obrero jobs must be able to read and write; must live permanently in the community or along his section of road; must be physically fit, and have the respect of the community. From the applicants, the regional administrator and supervisors will select two or more acceptable candidates, with the final selection to be made with assistance from members of the local community.

The obrero will be assigned a specific number of kilometers, with a maximum of 5 kms. for full-time maintenance. The obrero will sign a formal contract document with DGM, stating responsibilities such as the distance to be covered; number of work days and holidays' salary, and specific tasks. These tasks will include cleaning of ditches and rights-of-way, cleaning of culverts, filling and hand tamping potholes, redistribution of gravel, removal of debris, and care of hand maintenance tools assigned to him (with a list of the tools). The contract will also define DGM's responsibilities which will include the provision of hand tools and materials, supervision and a schedule of dates for receipt of salary. Finally, the contract will instruct the obrero how to fill out daily work sheets and specify causes for dismissal.

At the inauguration or formal community acceptance of a rehabilitated road, the obrero(s) will be named, hand tools, identification card, and hard hat presented to the obrero and his name posted at the beginning and the end of his assigned section for routine maintenance.

Following selection and contracting, the obrero will be given a maximum of a one-week training course at the Regional DGM/DGC Center. During training the obrero's importance to his community and importance of his work in the national transportation system will be stressed.

2. Periodic Maintenance

The DGM district heavy equipment team will be scheduled to "pass" each road twice annually, to do heavy grading, shaping, and compacting and deliver new gravel and culvert pipe as needed. In general, it is estimated that the heavy equipment team will be able to average 3 kilometers daily. Depending upon the type and extent of necessary repairs, the village committee may be requested to provide unskilled labor for one or two days cooperating with the equipment team. The local obrero will coordinate such volunteer labor with his regional supervisor and community maintenance committee.

Based on DGM's experience in rural road maintenance, costs per kilometer will probably remain stable through 1985 at $800/km annually. However, beginning in 1986, these costs are expected to rise 5% per year through LOP. This assumption is taken into account in the table below.

The total routine and annual cost per year is illustrated as follows:

Maintenance Cost/Year (at $800/Km/Year with 5% inflation)

| Kilometers Maintained | 1985 ($800/km) | 1986 ($840/km) | 1987 ($880/km) | 1988 ($925/km) | 19889 ($970/km) |
|---|---|---|---|---|---|
| 750 | $600,000 | | | | |
| 1,750 | | $1,470,000 | | | |
| 2,000 | | | $1,760,000 | | |
| 2,250 | | | | $2,081,000 | |
| 2,500 | | | | | $2,425,000 |

The maintenance cost illustrated ($8,336,000 total) will be financed out of counterpart funds. The tools and equipment will be purchased by Project funds (see Annex H for list of tools and equipment). Most of the hand tools used for this routine maintenance will be procured locally. Tools not available through this method will be purchased locally or imported from the United States.

e. Spare Parts for Equipment

The Mission and SECOPT are aware that private contractor equipment will suffer a certain level of deterioration over the life of the Project. While the provision of heavy equipment to the private sector with Project funds is not deemed necessary, the timely availability of imported replacement parts is a problem given the strict controls of foreign exchange at the Central Bank of Honduras. To address this problem, the Project budget includes $2.8 million in foreign exchange for replacement parts.

This $2.8 million component will be provided in the following manner:

establishment of a dollar account in a U.S. bank so that importers of spare parts can request from the Central Bank an import permit utilizing the present auto financing system. Under this system, the importer would receive an import permit within five days.

Through this approach, foreign exchange will be readily available to the contractors working under this loan for the above purpose. The details and procedures for the disbursement of these funds will be the subject of a future Project Implementation Letter.

4. Project Administration

The Project background and institutional analysis sections summarize A.I.D.'s involvement with SECOPT as well as the strengths and weaknesses of the DGC and its A.I.D. Implementation Unit. This section describes the Project's organization and the functions to be carried out by each of the implementing entities.

The Honduran Ministry of Communications, Public Works and Transport will be the counterpart agency of this Project. Under SECOPT's General Directorate of Highways, the A.I.D. Implementation Unit will assume Project management responsibility. The staff of the A.I.U. will be divided along two functional lines -- administration and construction. The administrative function will be carried out by a central office and the road construction carried out by three regional field offices. The responsibilities of those offices are summarized below:

a. SECOPT

Dirección General de Caminos (DGC) - Central Office

1) Overall management and coordination of project implementation and construction activities.

2) Selection and prioritization of elegible subprojects according to established criteria.

3) Selection of construction supervisors and general contractors.

4) Development of construction schedule, analysis of plans for construction packages, review of proposals.

5) Award of construction contracts, payment to contractors and monitoring overall progress of the Project.

b. Dirección General de Caminos - Regional Field Offices

1) Conduct the social, economic, and environmental analysis for each candidate road.

2) Apply the selection criteria to each.

3) Present the list of acceptable roads in order of priority, as determined by the selection criteria, to the Policy Selection Unit, based in Tegucigalpa.

4) Oversight responsibility for the construction of road segments in its assigned geographic area.

5) Preparation of contract packet which will include road plans and specifications to be submitted to the central office for review and approval.

6) Administration and supervision of contracts.

c. Dirección General de Mantenimiento

1) Develop maintenance plans and provide general maintenance of all access roads constructed under this Project and predecessor Project (522-0164).

2) Participate in identification of road segments for construction packages.

3) Develop plan with local leaders to ensure community participation in routine maintenance activities.

4) Provide advice and training to rural communities on rural road maintenance.

d. Communities

1) Establishment of community maintenance committee in the patronato or mayor's office.

2) Provide labor to maintain access roads after construction is complete (routine maintenance activities only).

5. Subproject Selection Process

a. Road Selection Committee

Requests for rural road improvement flow into SECOPT almost daily from individual groups, villages, municipalities, and legislators. Under this Project, the road requests will be channeled to the Policy Selection Unit of the A.I.D. Implementing Unit (AIU) , consisting of the Technical Analysis Selection Unit (TASU), and the Policy Selection Unit (PSU).

b. Technical Analysis Selection Unit (TASU)

The TASU will contain three groups of analysts, one for each of the Project's geographic regions. Every group will consist of one agronomist/agricultural economist, and one promoter and one statistician and one economist supported by administrative staff such as a secretary and accountant at each regional office. Prior to implementing their responsibilities under the Project the TASU will collect and review the various studies, surveys and maps dealing with infrastructure and demographic data, which are available in Honduras. At this time, Rural Roads I is providing technical assistance to complete base line data collection for selected regions throughout Honduras. The information in this "data bank" will be used in the first stages of the selection process and will reduce the amount of work carried-out in the field. The TASU will use topographical maps to locate each candidate road segment, to establish how each relates to the existing all-weather road network and markets, to establish an approximate area of influence based on the road network and geographic constraints, and to estimate the number of

farms (or hectares) within that area of influence. Thereafter, the TASU staff will conduct the social, economic, and environmental analysis for each candidate road; apply the selection criteria to each; and present the list of acceptable roads in order of priority, as determined by the selection criteria, to the Policy Selection Unit.

Training of TASU personnel is critical for the Project and other future needs of the GOH. Accordingly, technical assistance will be provided to the TASU for the purpose of creating an analytical capability within the unit, and training personnel in economic analysis techniques. Computer and ancillary equipment will be purchased for this purpose as well as for other Engineering and Administrative applications.

c. Policy Selection Unit

The PSU will consist of representatives from the existing AIU within SECOPT and representatives from A.I.D. The PSU will examine the priority list of roads that have met the economic and social criteria, as determined by TASU, and will group them into "road packages" to be bid on by contractors. This will ensure that the roads with the greatest economic potential get built at minimum contractor mobilization costs, and have the greatest impact on beneficiaries. This Committee will, at a minimum, be made up of the head of AIU, the USAID Project Officer and a contracted Project Economist.

E. End of Project Status

During the life of the Project, funds will be used for road rehabilitation, training and commodities purchases. By the end of the Project it is expected that:

- 1000 kilometers of rural tertiary roads will be upgraded to all-weather standards and approximately 400 linear meters of bridges and/or major culverts constructed.

- A Rural Roads Design and Construction Manual will be developed to be used for project implementation by the DGC with technical assistance provided by the USAID Engineering Office.

- Approximately 2500 km of rural roads (1000 kms. this project and 1500 kms predecessor project) will be maintained on an annual basis.

- 30 SECOPT engineers, managers and support personnel will have participated in a training program designed to maintain and upgrade their skills and professional abilities. Training will be short term (seminars and conferences) and will include all aspects of road, highway and bridge pre-construction.

- Access to markets, and delivery of social and technical services of approximately 50,000 rural families will be created and enhanced through the implementation of this Project.

- The overall institutional capabilities of SECOPT will be further strengthened and consolidated.

F. Project Inputs

1. Road Construction

To achieve the goal of the Project, funds will be used to finance the materials and contract related costs for the rehabilitation of the roads and the construction of the bridges and culverts. In addition, Project financing will pay for the procurement of commodities associated with A.I.U.'s central and field offices. As maintenance is critical to long term viability of road networks, Project monies will also be used to procure commodities(e.g. light vehicles, hand tools) to improve SECOPT's DGC maintenance capability.

Although the Project will have three main regional offices for Project implementation, there will still be a need for as many as four sub-regional offices in the more remote areas. In these remote areas, building spaces meeting the minimum engineering office standards are not available and structures will need to be constructed using Project funds. The required land will be purchased by counterpart funds.

Rent and utility costs for the central and regional field offices as well as normal office supplies, will be financed out of counterpart funds. Project financing will pay for the procurement of necessary typing, reproduction, drafting and PC computer equipment. Vehicles, construction and survey equipment will also be financed out of Project funds.

2. Training

Project resources will be used to further develop the institutional capability of DGC. This development will take the form of training for DGC professional staff and managers and technical assistance. The training will consist of short courses and seminars held in country and overseas to update the Honduran engineers and other professionals in the planning, analysis, construction, maintenance and management of an ever increasing transportation system. Through these periodic training sessions, current practices and problems can be addressed and changing needs identified.

a. In an effort to more clearly define this aspect of the Project a trip was undertaken by the Director of Maintenance, the Director of Highways, the Head of AIU (Honduras) and the Rural Roads Project Officer (A.I.D.) to the Dominican Republic in May 1985 for a dialogue with officials involved in the implementation of the DR Rural Roads Maintenance and Rehabilitation Project.

This trip was useful to the participants by providing them with an opportunity to determine relevant areas for training and allowing a first hand look at the very successful maintenance component of the DR Project. One of the results of this trip has been a decision by A.I.D. to proceed with a maintenance component based on remuneration for members of participating communities. More importantly perhaps, SECOPT officials have verbally agreed to investigate further and eventually institutionalize a paid maintenance component involving the beneficiary communities. The DR visit convinced the participants that the only possible long term arrangement for guaranteeing that maintenance begin and continue with community participation is through a monetary arrangement between SECOPT and the communities.

b. For field personnel training sessions will emphasize practical application of techniques related to such matters as soil compaction, drainage structure design and placement, erosion control measures and equipment maintenance. Middle managers and central office engineeers will receive training in areas such as problem analysis and decision-making, transportation planning, road system management, CPM, planning and supervision. Administrative personnel will receive training on computer use and application.

3. Technical Assistance

a. Resident Engineers/Economist

The technical assistance will consist of three resident engineers (one expatriate and two Honduran) and one economist (Honduran) for the life of the Project. The expatriate will serve as a counterpart to the Chief of SECOPT's A.I.U. and will provide guidance on construction design standards, subproject selection criteria and overall Project scheduling. The incumbent will also help resolve implementation difficulties as they occur. The local hire engineers and the economist will assist the expatriate in carrying out his assigned tasks. In addition, these personnel will consult on a periodic basis with the relevant AID technical offices in order to assure that a systematic procedure exists to allow for a congruency between this Project and other AID funded Project efforts in Honduras.

4. Commodities

a. Vehicles

Execution of the road and trail upgrading in three regions simultaneously will require increased personnel and support equipment. Although the vehicles purchased for Rural Roads I project will be utilized in this project, an additional six (6) pickups will be required for the three regional offices and two five passenger vehicles for the central staff. In addition to the (8) eight vehicles needed by the AIU (3) three additional pickups will be required by DGM for the three regional maintenance engineers. These will be financed with project funds for approximately $165,000.00.

b. Office Equipment

Project financing will pay for the provision of the necessary typing, drafting and reproduction equipment for each regional office and the central office. In addition to the above, the central office and (3) three regional offices will be provided with a computer and ancillary equipment to meet the needs for project implementation. Training for computer use and application will also be provided.

c. Tools/Equipment for Hand Labor Maintenance

Since maintenance work on the roads will be labor intensive hand tools will be required. A.I.D. loan financing will be used to purchase approximately $100,000 worth of tools and equipment to be used to carry out the routine/preventive road maintenance activities. Annex H gives the hand tool requirements for communities involved in the routine hand maintenance program.

The tools and equipment will be controlled by the maintenance engineers and be held in the AIU Regional offices to be used only for the maintenance of rural roads.

The tools will be distributed during or after the quarterly maintenance review to be made by the DGM maintenance engineers. The tools will be inventoried on a periodic basis. Tools lost or broken during maintenance work will be replaced by the GOH during project implementation.

## IV. PROJECT ANALYSES

### A. Financial Analysis

#### 1. Financial Plan

The total estimated cost of activities to be financed under the Project is $34.852 million. Of this amount, A.I.D. will finance $20 million - $18.685 million loan and $1.315 million grant - while the GOH will contribute $14.852 million. The percentage contribution for the Project is 57 percent for A.I.D. and 43 percent for the host country and the anticipated disbursement period is four years. The A.I.D. loan funds will be used to underwrite the costs of the construction contracts, purchase of vehicles, other equipment, replacement parts for heavy machinery, and contract some of the local personnel (e.g., construction, supervisory engineers) needed to implement the Project. Grant monies will finance three (one international and two local hire) construction advisors to SECOPT, fund training for SECOPT personnel, and carry out periodic evaluations. The GOH contribution will cover personnel costs (salaries and logistical support expenses) necessary to implement the Project and road maintenance expenses during the Project period. Table I below presents a summary cost estimate of the financing required and Table II shows the anticipated disbursement plan for the life of the project. Table III shows the projections of expenditures by Fiscal Year.

TABLE I

RURAL ROADS II - PROJECT NO. 522-0214
SUMMARY COST ESTIMATE AND FINANCIAL PLAN
(US$ 000)

| NO. | SOURCE | AID GRANT FX | AID GRANT LC | AID LOAN FX | AID LOAN LC | TOTAL AID | GOH | GRAND TOTAL |
|---|---|---|---|---|---|---|---|---|
| | USES | | | | | | | |
| I. | Rehabilitation and Upgrading of Rural Trails & Roads | | | | | | | |
| | 1. Construction | | | | | | | |
| | a) Vehicles and Equipment | | | 135 | | 135 | | 135 |
| | b) Road Rehabilitation Contracts | | | 2,850 | 12,920 | 15,770 | 4,685 | 20,455 |
| | c) Bridges | | | | 1,200 | 1,200 | | 1,200 |
| | d) Administration | | | | 600 | 600 | | 600 |
| | e) Region Work Centers | | | | 265 | 265 | | 265 |
| | 2. Road Maintenance | | | | | | | |
| | a) Vehicles, Other Equipment and Hand Tools | | | 150 | | 150 | | 150 |
| | b) Administration | | | | | | 992 | 992 |
| | c) Maintenance Activities | | | | | | 8,336 | 8,336 |
| II. | Technical Assistance | 870 | | | | 870 | | 870 |
| III. | Training | 80 | | | | 80 | | 80 |
| IV. | Evaluation/Audit | 150 | | | | 150 | | 150 |
| V. | Contingency & Inflation | 215 | | 50 | 515 | 780 | 839 | 1,619 |
| | TOTAL | 1,315 | | 3,185 | 15,500 | 20,000 | 14,852 | 34,852 |
| | | 1,315 | | 18,685 | | 57% | 43% | |

TABLE II
RURAL ROADS II - PROJECT NO. 522-0214
COST OF PROJECT OUTPUTS/INPUTS
(IN $ 000)

| No. | Project Inputs | Project Outputs by Fiscal Years 1985 | 1986 | 1987 | 1988 | 1989 | Total |
|---|---|---|---|---|---|---|---|
| | AID APPROPRIATED | | | | | | |
| I. | REHABILITATION & UPGRADING OF RURAL TRAILS & ROADS | | | | | | |
| | 1. Construction Activity | | | | | | |
| | a) Vehicles & Equipment | | 135 | | | | 135 |
| | b) Road Rehabilitation Contracts | 800 | 3,945 | 3,945 | 3,945 | 3,135 | 15,770 |
| | c) Bridges | | 300 | 300 | 300 | 300 | 1,200 |
| | d) Administration | 50 | 150 | 150 | 150 | 100 | 600 |
| | e) Region Work Centers | 20 | 245 | - | - | - | 265 |
| | 2. Road Maintenance | | | | | | |
| | a) Vehicles, Other Equipment and Hand Tools | | 150 | | | | 150 |
| | b) Administration | | | | | | |
| II. | TECHNICAL ASSISTANCE | 70 | 270 | 230 | 145 | 155 | 870 |
| III. | TRAINING | | 40 | 40 | | | 80 |
| IV. | EVALUATION/AUDIT | | | 50 | | 100 | 150 |
| V. | CONTINGENCY AND INFLATION | 40 | 210 | 190 | 185 | 155 | 780 |
| | TOTAL AID | 980 | 5,445 | 4,905 | 4,725 | 3,945 | 20,000 |
| | GOH APPROPRIATED | | | | | | |
| I. | REHABILITATION & UPGRADING OF RURAL TRAILS & ROADS | | | | | | |
| | 1. Construction Activity | | | | | | |
| | Administration | | | | | | |
| | d) Administrative Costs of the executing unit of the project in SECOPT | | 248 | 248 | 248 | 248 | 992 |
| | Road Rehabilitation Contracts | | | | | | |
| | b) Operating & Supervision Costs of the executing unit of the project in SECOPT | | 1,033 | 1,257 | 1,257 | 1,138 | 4,685 |
| | 2. Road Maintenance | | | | | | |
| | a) Maintenance activities to be performed by the Directorate of Maintenance in SECOPT and the communities laborers | 600 | 1,470 | 1,760 | 2,081 | 2,425 | 8,336 |
| V. | CONTINGENCY AND INFLATION | 35 | 165 | 195 | 215 | 229 | 839 |
| | TOTAL GOH | 635 | 2,916 | 3,460 | 3,801 | 4,040 | 14,852 |
| | GRAND TOTAL | 1,615 | 8,361 | 8,365 | 8,526 | 7,985 | 34,852 |

TABLE III

RURAL ROADS II - PROJECT NO. 522-0214
PROJECTION OF EXPENDITURES BY FISCAL YEAR
(US$ 000)

| | A I D | | | | | | |
|---|---|---|---|---|---|---|---|
| | LOAN | | GRANT | | Total | | |
| Fiscal Year | FX | LC | FX | LC | AID | GOH | Total |
| 1985 | 110 | | 152 | 718 | 980 | 635 | 1,615 |
| 1986 | 376 | | 996 | 4,073 | 5,445 | 2,916 | 8,361 |
| 1987 | 356 | | 731 | 3,818 | 4,905 | 3,460 | 8,365 |
| 1988 | 181 | | 726 | 3,818 | 4,725 | 3,801 | 8,526 |
| 1989 | 292 | | 580 | 3,073 | 3,945 | 4,040 | 7,985 |
| TOTALS | 1,315 | | 3,185 | 15,500 | 20,000 | 14,852 | 34,852 |

2. Project Disbursement System

Financing of Project costs will follow the procedures for direct payment and reimbursement established under the Rural Roads I effort. Costs associated with technical assistance, training, evaluation and procurements of spare parts for heavy equipment to the contractors for road construction will be paid directly to the suppliers/participants by the Mission in accordance with existing A.I.D. practices. The Mission will also make direct payment to contractors for road construction contracts executed by SECOPT. In order to faciliate implementation, the Project will continue the on-going practice of a local currency revolving fund. The fund will consist of L1,000,000 which will be used to make advances to contractors up to 10 percent of the value of the contract. Reimbursement to the GOH revolving fund will take place upon contractor submission of vouchers for payment under a given contract. Payments to contractors will be contingent upon satisfactory construction progress and all work will be reviewed and certified by USAID and SECOPT engineers.

A rotating fund will be established for the project by GOH to provide advances for those contracts which A.I.D. makes direct disbursement to the contractor.

These GOH funds (approximately Lps. 1,000,000, equivalent to US$ 500,000) will be utilized to provide contractors financed under the Rural Roads II Project with advances for initiation of road projects in accordance with A.I.D. approved contracts.

The amount and procedure for liquidation of disbursed advances will be determined during implementation and will be the subject of an Implementation Letter at that time.

B. Economic Analysis

1. Benefits Resulting from Road Improvement

Under a pure rural road project, where road improvement is carried out without other complementary inputs, as is the case in this Project, the major effects of improved accessibility are expected to be:

a. reduced risk of moving production to market;
b. technical information more readily available to the small farmer;
c. reduced transport costs;
d. more efficient utilization of agricultural inputs such as credit and agricultural extension.

The above accessibility effects produce a second round of change that can be divided into the two groups shown below. It is the changes in this second round that directly increase farm income.

| Group 1 | Group 2 |
|---|---|
| a. increased farm gate price; | a. increased productivity; |
| b. increased product quality;and | b. increased land under cultivation; and |
| c. reduced spoilage | c. changes in cropping patterns |

For those benefits in the first group, road improvement alone is sufficient for their realization. For the second group, if other essential inputs are presently unavailable or fully employed, additional agricultural inputs, credit, technical assistance, and marketing facilities may have to be provided. Without these additional inputs, road improvement may fail to produce significant increases in productivity, in land cultivated, or in new crops.

## 2. The Importance of The Availability of Other Inputs and Services

### a. The Effect on Productivity

The combination of the assurance that the road indeed will be open all year long, and that there will be a significant increase in farm gate price as a result of road improvement, will provide the farmers with sufficient incentive to increase area (extensive response) and to increase productivity (intensive response) in significant amounts. The latter increase will occur as the farmer finds it profitable and possible to purchase inputs such as fertilizer and better seeds. Prior to the road improvement, the sum of the high cost of transport for the inputs to the farm and the extra output to the market place was either greater than or equal to the extra income to be earned from the increased production. Thus, few, if any inputs are used in this situation. With road improvement and the lower cost of inputs and higher farm gate price for crops, all due to the fall in transport cost, the farmer will increase input usage until the value of the last extra unit of production is equal to the value of the extra costs (including transport and all other production costs).

### b. The Effect on Total Production

All other things equal, production changes will be greater, the more readily available are technical assistance and credit, and the closer a road is to an on-going agricultural development project. In the final selection stage, the availability of TA and credit, and the existence of agricultural projects will be one of the factors used to establish the final priority list.

As implied at the outset of this economic section, road improvement may be a necessary and sufficient condition for obtaining increased farm income from reduced transport costs (increased farm gate prices) and reduced spoilage and wastage, but it is only a necessary condition for increased farm income from increased hectarage and productivity.

### 3. Benefits Anticipated and Quantified for this Project

Of the benefits described in the above section, there are two major benefits which are expected to result from the improvement of the rural trails and dirt tracks to all-weather gravel status. They are:

a. increased farm gate prices, resulting from the decrease in transport costs paid by farmers as they switch from a more expensive mode of transportation such as pack animal to a less expensive mode such as light truck, or from light trucks to larger trucks. The switch becomes possible because the improved road allows easy access for the larger, more efficient per quintal, vehicles.

b. increased production, as farmers learn that the road segments will indeed be kept all-weather, and as a result, that produce will not spoil or rot at the road side. All of the factors associated with increased production and productivity, as described in the introduction, apply. However, during the implementation phase of the project, when road segments are being analysed, only increased production and productivity will be estimated.

### 4. Benefits Not Quantified

The above benefit discussion has not considered any increase in income to the transporters as a result of vehicle operating cost savings (VOCS) flowing from the improved road. In most cases, the savings to transporters, as a result of improvement from trail to gravel, all-weather status, is usually small and normally not worth the estimate. This occurs because traffic volume prior to road improvement is low for those vehicles that continue to service the road once the road is improved. The VOCS captured by these transporters simply have little impact on the rate of return analysis.

Benefits resulting from improved access to health and education facilities are not quantified and hence are not included in the benefit/cost analysis. However, they have been included in a formal manner in the selection process developed for this Project.

### 5. Results on Previous Road Project Evaluations

A baseline data survey is being completed for the areas where roads have been, or are likely to be, improved under the current Project. It covers many of the same areas that will be included in the new Project.

There is enough available indicative information from informal surveys, made on the roads already completed under the previous and current projects, to allow us to conclude that the Project will certainly produce an economic internal rate of return of at least 12 percent. A summary of the findings from the informal surveys is presented below.

Confirming the general introductory and summary statements on the effects of rural road improvement made at the beginning of this section , the formal and informal evaluations of the various rural road projects in Honduras indicate that, as a result of road improvement:1/

a. area planted rises by more than 20 percent;
b. more high-valued cash crops are cultivated;
c. subsistence farmer income rises by as much as 300-400 percent;
d. small farmer income rises by as much as 48 percent;
e. farm gate prices rise by 10-15 percent; and
f. productivity increases.

As the table below indicates, the transport cost per ton/km falls percipitously when an improved road can be travelled by progressively larger vehicles. The actual change in farm gate price will depend upon the length of the improved road as a percentage of the total distance to market, and the amount of competition between truckers. Experience indicates that there is sufficient competition to guarantee that the farmer obtains at least 75 percent of the vehicle operating cost savings resulting from road improvement.

Transport Cost by Type of Conveyance[1]

| | |
|---|---|
| Pack Animal | $1.25 |
| Oxcart | .90 |
| Light Pick Up | .50 |
| 1 1/2 Ton Pick Up | .30 |
| 6 Ton Truck | .15 |

6. The Effect of the Anticipated Changes in Basic Grain Farm Gate Price, and Yields on Farm Income

A sample of the roads proposed by SECOPT for improvement were analyzed with respect to the economic impact of the road improvement on the population living near the roads. The selection of the roads evaluated was based entirely upon the availability of published data concerning the economies effected by the project. Sufficient data were found to analyze road candidates in three distinct regions, Comayagua, Atlántida and Olancho.

a. Economic Benefits

As explained above, various economic benefits can be expected from improvements in transportation. Incomes to small farmers can be expected to increase due to:

---

1/ AID/LAC/P-043. Honduras Project Paper, Rural Trails and Access Roads, Project Number 522-0164, Loan Number 522-T-035, March 24, 1980.

1) increased farmgate price resulting from reduced transportation costs.

2) increased yields as farming practices improve, farm losses reduced and more appropriate inputs applied, and;

3) diversification into higher valued, usually more perishable, crops.

Because accurate data was scarce, we attempted to maintain extremely conservative estimates of the benefits in order to apply as strict as test possible in determining the economic viability of the project roads.

For a given road cluster, regional averages of farm size and cropping patterns were used. Based on the most recent survey taken of farm budgets for basic grains,[1/] changes in gross revenue and production costs were estimated for a typical farm moving from the existing traditional technology to an improved (medium) technology. It was assumed that the full transition would be achieved five years after the completion of the road improvement. In addition, it was assumed that prices received by farmers would increase over time due to transportation cost reductions. All savings in transport costs have been allocated to the farmer. Although these savings could be shared between the farmer and intermediaries, the actual gain to the economy as a whole would be identical regardless of the distribution of the savings.

b. Cost Assumptions

In this analysis, economic costs were assumed to be equivalent to their financial costs, with the exception of unskilled labor and capital costs.

1) Unskilled Labor
Unskilled labor was shadow priced at 50 percent of its financial value.

2) Capital Costs
Capital costs were adjusted upward by a factor of 1.3 to reflect more accurately the value of the foreign exchange required to purchase imported equipment.

Annual maintenance costs per kilometer were assumed to be $250. The opportunity cost of capital was assumed to be 12 percent.

c. Three Case Studies: Cost/Benefit Analysis

Below is a profile of the three case studies. It should be remembered that these estimations are for illustrative purposes. The actual selection process to be used to identify those roads which would be included in the project

---

1/Enterprise Budgets for Grains in Honduras: 1980, Banco Nacional de Desarrollo Agrícola and Oklahoma State University, August 1980

would require a comprehensive study as outlined in the section of this report on the selection criteria. (See Annex J for a detailed explanation of the cost/benefit methodology applied).

Growers in all three regions produce basic grains. The majority also produce some fruit trees, others coffee and many have cattle. While the improvement of a road would represent gains to all productive activities of the farm, in order to standardize the methodology, the potential income gains derived from increased farmgate price and yields for basic grains was the sole focus of preliminary assessments.

1) COMAYAGUA REGION

Proposed road improvement: Access for San Isidro, Victoria, Canchia, La Montanuela, El Paraiso, El Buen Pastor to the Carretera del Norte.

Distance: 52 kilometers

Number of affected families: 1094

Density: 21 families/Km

Estimate of farm families: 75 percent

The proposal would improve access of small villages to a major highway, the Carretera del Norte, which connects the metropolitan areas of San Pedro Sula and Tegucigalpa.

Farms in the area of the proposed road improvement produce basic grains, fruits, vegetables and livestock.

The analysis estimates only the expected benefits accruing to basic grains production. Annual farm income is expected to increase by 340 dollars by the sixth year after the completion of the Project. The resulting cost benefit ratio is 1.14. In an area such as Comayagua, it is anticipated that improved roads would encourage farmers to diversify very quickly into higher valued fruits and vegetables destined for the urban markets and thereby increasing the ratio significantly.

2) OLANCHO REGION

Proposed road improvement: Access for San Esteban, Corral Viejo, El Ciruelo, Toro Muerto, and San Antonio de Pacura.

Distance: 36.4 Km.

Number of affected families: 695

Density: 19 families/Km.

Estimate of farm families: 95 percent

The region serviced by the candidate roads is relatively remote. The project would improve access of three small villages to one of the main road system traversing the Department of Olancho. Annual farm income would increase by 350 dollars by the sixth year after the Project's completion. The resulting cost/benefit ratio for this road segment is 1.06.

3) ATLANTIDA REGION

Proposed road improvement: Access from Suyapa de Leon, Nueva Florida, Texiguat, El Retiro, Jilama to the Tela - La Ceiba - Mezapita carretera.

Distance: 35 Km.

Number of affected families: 2428

Density: 69 families/Km.

Estimate of farm families: 70 percent

The proposal would improve access of several small villages to the highway connecting the metropolitan markets of La Ceiba and Tela. By the sixth year after the completion of the Project, it is estimated that the road improvement would increase annual farm incomes by more than 500 dollars. The road improvement project yields a cost/benefit ratio of 2.34.

d. Conclusions

In conclusion, the cost-benefit ratios estimated for each of the case studies surpassed unity. The road project proved to be justifiable based on an analysis which only took into account two of a series of benefits the project is expected to generate. This analysis only considered gains from increases in productivity and from transportation cost savings. The other, more significant gains, such as those from diversification and improved access to educational and medical facilities, were excluded from the analysis because data was unadequate. Nevertheless, this analysis does demonstrate that the project is economically justifiable and indicates that the cost benefit ratios would have been greater had a more comprehensible analysis been possible.

Finally, it should be borne in mind that an important component of this project is dedicated to the collection of salient economic and social data

(which will be done by the Project Economist) concerning the effected communities and that the final selection of the road candidates will be based upon a thorough examination of the socio-economic conditions of the communities.

7. Impact on the National Economy

a. Aggregate Sector Benefits

The improvement of the rural access roads will lead to increased agricultural production and increased income for the approximately 10,000 farm families who will benefit from this project. Total annual value added from the additional agricultural production is expected to exceed $5 million once the full impact of the roads occur, about six years after the last one is constructed.

b. Import Substitution

Currently several agricultural commodities which could be produced competitively in Honduras are imported. An improved road network which leads to greater market access should lead to a reduction of exports of such commodities as fruits, vegetables, and dairy products. On the other hand, increased exports of citrus, vegetables, and perhaps basic grains are expected. The reduction in imports and the increase in exports will have a positive impact on the country's balance of payments.

C. Technical Analysis

The Mission's Goal in choosing a technology for rural access road improvement is to identify a combination of capital and labor which would allow reconstruction or rehabilitation of 1000 kms of roadways at a reasonable cost and within a four year period. Accordingly, interrelated factors were considered with respect to the technology used on roads. The Project design builds on the related experiences gained under the three earlier A.I.D. supported Access Roads Projects and the Rural Trails Project.

In determining the most appropriate technology for this Project two alternatives were considered -- (1) the intensive use of hand labor and (2) a combination of hand labor and heavy machinery.

1. Access Roads - Labor Intensive Methods

The Mission has concluded that a highly labor intensive project would not be satisfactory. If large amounts of labor were to be used on a subproject, workers would have to be recruited from a wider area which requires more transport time, not to mention additional expense. On-site construction progress itself would be slower since a more involved organizational and institutional system would be needed and a greater number of generally unskilled laborers would be working on the job.

The principal advantage of the hand labor approach is its potential for generating employment -- especially within the unskilled manual labor sector

of the society. However, this asset is outweighed by a series of constraints inherent in hand labor technology. First, it is not cost effective. The average cost of manually upgrading rural roads in Honduras is approximately $20,000/Km. For comparative purposes, the estimated cost of upgrading under the hand labor - machinery mix approach is $16,600/km. Second, hand labor technology is exceedingly slow. Recent Mission and other donor experience reveals that upgrading of a typical 3 kilometer section requires 40 men engaged full time for a one year period. A similar section with the hand labor - machinery mix approach can be completed in one and one-half months. When extrapolated to apply to a 20 kilometer construction package, the time required for upgrading under the labor intensive approach is over six years longer than the time needed for accomplishing similar work with the hand - machinery mix approach. Third, the quality of hand labor roads is decidedly inferior. The manually built roads and trails opened under the A.I.D. Rural Trails Project as well as those built by COSUDE have suffered more deterioration than expected. This fact has not only impeded anticipated traffic flow but has contributed to increased long term maintenance costs.

Then too, there would be problems of absolute labor availability. The typical farm family in the area of concentration has 2.1 adult members who would be able to work on road improvements and maintenance. The crop planting and harvest seasons generally covers April through May and October through January respectively. These seasons may vary by a month or so depending on the area and crop, but one can assume that the local population would be available for road construction work only about six months out of the year. Effectively then, only approximately 24 months of local, unskilled labor time can be expected to be available over the life of the Project. Finally, a study completed under the predecessor Project indicated that, in general, sufficient labor for an exclusively hand labor approach was not available due to a scarcity of population in the rural areas and conflicting agricultural labor requirements. Based on these facts, it is the Mission's judgement that a hand labor machinery mix is the most appropriate for the implementation of this Project.

2. Road Design - Standards

Road design work and cost estimates will be carried out by the AIU engineers for each road prior to construction work. The design work will be for the basis of contract plans and specifications to be included in the contract packet bid information to be furnished prospective contractors after publications of IFB's.

Access Roads in this program will be constructed to meet minimum design standards established by SECOPT for its maintenance responsibilities and documented in a Road Design and Construction Manual which will be a Condition Precedent to disbursement of funds. In general gravel surfaces of four to five and one half meters will be provided over a roadbeds of five to seven meters in width. The roadbeds will be compacted and crowned to assure adequate runoff of rain water, and will be provided with drainage ditches and cross drainage as required to dispose of normal runoff via natural drainage channels. Culverts, low water fords, and small bridges of a type and capacity

deemed appropriate will be provided as required. Engineering decisions relative to both road and bridge construction will be made prior to construction through the use of plans and specifications approved by A.I.D. Design changes will be carried out in the field by GOH engineering staffs in accordance with the approved Design and Construction Manual. Since all subprojects are to consist of renovation and upgrading of existing roads and trails, existing rights of way will be followed and little or no realignment is anticipated. In isolated instances where realignment may be required, determinations will be made by GOH.

Bridging or similar devices to be used in the course of road construction will include improvement of natural fords, submerged crossings (concrete and rock pads laid on stream beds), or possibly, simple span concrete deck bridges supported by mortared rock headwalls. Installation of these structures is to be done on a unit price basis as part of a given construction contract for a group of roads. Construction will be carried out under arrangements discussed earlier in this Paper, i.e., construction contractors using labor, rental equipment and necessary construction materials under the direction and supervision of DGC Project Engineer and Field Personnel.

The four (4) meter road standard will be the minimum standard used in this project. This standard basically will be single-lane roads with a maximum width of four meters including wearing surface and shoulders except for area for turning and vehicle passage. Average daily traffic on these projects is expected to be less than 10 vehicles trips. Roads will employ compacted embankments, and compacted gravel surfacing. Curvature and gradient will vary with site conditions but not exceeding minimum design standards. Bridging or similar devices to be used in the four (4) meter road construction will be the same as used in the 5.5 meter road standard described above.

3. Maintenance

Labor for the ordinary/preventative maintenance of rural roads will be provided by the communities under the direction of a DGM engineer who will visit the community on a quarterly basis. The DGM engineer will work with the social promoters and advise community members as to required maintenance work such as the filling of potholes and cleaning of ditches and culverts.

The DGM will be responsible for the overall maintenance of access roads constructed under the loan. The DGM will provide the annual maintenance for roads upgraded in this Project and predecessor Project (522-0164) in accordance with the Road Maintenance Management Plan (RMMP) approved by A.I.D. Prior to the beginning of construction of the roads, villages will be asked whether they will participate in maintenance. Maintenance participation will be an important factor in road selection. Local village organizations will be provided with tools by SECOPT.

The engineering design reduces the amount of maintenance requirements for the roads to only two man-days per month. Since the selection process for roads

guarantees a minimum of 10 families per kilometer of road (and probably more like 30), the typical road will require no more than one or two days of labor per year from each able-bodied male in its area of influence. Nevertheless, the mobilization of this labor will require sustained organized labor efforts. Patronato organizations are more apt to generate enthusiasm in the village for short bursts of effort on identifiable projects. Sustained maintenance efforts will require a long-term commitment which is more likely to be achieved from the municipal administrative structure. Furthermore, patronatos are village-specific, with few ties between villages whereas the maintenance of roads will require inter-village organization of labor and the determination of the area of responsibility of each village for roads that serve a number of villages. Therefore, the Project will include agreements with the patronatos and with the municipalities for maintenance. The municipality can achieve intervillage cooperation by organizing and dividing labor among various villages affected by a particular road.

The question of achieving a minimal level of local maintenance know-how will also be addressed by the maintenance engineer from the DGM. He will perform road condition surveys to detect upkeep needs and produce a maintenance plan based on these needs. The social promotor will implement the plan through the community leaders. These leaders will be in communication with the municipal authorities in their areas. The maintenance agreement with the patronatos and municipalities will include provision for naming persons with these acquired skills as maintenance foremen.

### 4. Construction Costs

A review of cost per kilometer construction in other countries and in previous and current projects in Honduras indicates that the estimated $15,000 - $16,000 per kilometer is a reasonable cost for the work performed. The combined average cost of both trails and access roads rehabilitated for the current Project is $12,646 per kilometer. Listed below by geographic area, are a representative sample of costs incurred in constructing access roads (5.4 meters wide) and trails (4.0 meters wide) in Honduras under predecessor project (0164).

Loan 522-T-035 Access Roads and Trails

| DEPARTAMENT | KM. CONSTRUCTED | COSTS $ |
|---|---|---|
| La Paz | 64.60 | 453,010.52 |
| Intibucá | 127.0 | 1,040,037.63 |
| Ocotepeque | 41.0 | 521,267.05 |
| Copán | 164.3 | 2,407,204.18 |
| Santa Bárbara | 194.6 | 2,837,763.92 |
| Lempira | 33.6 | 278,651.00 |
| Cortés | 27.4 | 372,643.20 |
| TOTAL | 625.5 | 7,910,577.50 |

Average Cost: = $12,646.81

These cost figures are based on consultation between the USAID Engineering Office and the DGC. Based on the results of cost experiences gained to date under the current Project, the higher construction standards to be used, and the decision to use the technologies and contracting methods discussed earlier in the section, our estimates are that access road work should cost between $12,500 and $16,600 per kilometer. (See Annex N for a detailed breakdown of the labor and equipment components).

5. Improvement of Transportation Modes

Over the life of the proposed Project and the predecessor Project (0164), 2500 kilometers of rural roads will have been added to the transportation network in Honduras. Although the access has been greatly improved to increase the income of the small rural farmer, the mode of transportation available to him continues to be dependent on private commercial haulers and busses. The small farmer is still utilizing primitive wooden wheeled oxcarts, beasts of burden or carrying on his back produce, home products, firewood and supplies. The average small farm family cannot afford to purchase more modern conveyances that would enable them to take full advantage of the new and improved access available. Although busses, trucks, pickups are providing a necessary service the rural communities never had before, there is still room for improvement in the availability of transport services.

To help fill this gap and improve this situation, the Rural Roads Project will introduce new and improved modes of transportation during the implementation of the maintenance program.

The development of improved modes of transportation to better utilize the rural road sytem will be coordinated with the USAID/Honduras Rural Technologies Project. Under this Project local rural shops will be

established to build various transportation systems affordable by the rural farmer. Animals such as mules, horses and oxen are prevalent throughout Honduras. The first step towards improvement would be a horse or oxen drawn cart. The wheels, axle, and tires can be used from junked cars. The harness can be made by local leather shops. This improvement will increase the load carrying capacity from 200 lbs. per animal to 600 lbs. per animal using a cart. These vehicles will be fabricated through the Rural Technologies project and purchased for use in the Rural Roads II Maintenance Program.

Aside from animal power, the freight bicycle such as used in Perú and the Orient can be assembled locally onto a locally built frame and cargo box. This is a three wheeled unit with the two wheels on each side of the box and the back end of a bicycle attached in the rear to drive the unit.

As the income increases for the farmers served by the new roads, they will most likely utilize more modern farm equipment such as a single cylinder diesel engine rototiller for more intensive gardening. In China, these rototillers are often hitched to a four wheeled trailer to get their products and families to market. These travel slowly, about 20 miles per hour, but can be effectively used in the transport of personnel, tools and materials for road maintenance activities.

As a possible program in cooperation with the Rural Technologies Project, various units described above will be purchased and utilized in the road maintenance program as well as other community projects for those communities participating in road maintenance.

These units can be tested using the Rural Technologies Project field staff of CDI/PTR. Once the acceptability of any transport system is assured, then the Rural Technologies Project can possibly use one or more of their metal working shops to fabricate the equipment as needed throughout the life of Project.

### 6. Engineering Conclusions

The engineering studies, preliminary information and reports, and other data indicate that this is a feasible and sound project. The estimated cost of equipment and materials have been developed based upon the most reliable data available taking into consideration probable escalation costs. These estimates are considered reasonably firm. All materials and equipment are available and the acquisition of these items present no special problems. It is the judgement of the Project Committee that the requirements of Section 611(e)(1) of the Foreign Assistance Act of 1961, as amended, have been met.

## D. Contractual Arrangements

The choice of contracting approach is the result of USAID experience in Honduras with similar Projects.

Three basic construction management approaches have been tried under A.I.D. road and trails projects: the contract/equipment rental method (Loan 522-T-025), the force account method (Loan 522-T-030) and combination unit prices and equipment rental method (Loan 522-T-035).

To date, there have been few serious problems utilizing the latter method. Construction following this method established for the rehabilitation of roads under Loan 522-T-030, Hurricane Fifi Reconstruction and Rehabilitation, utilizing equipment rented from contractors. Earthwork for the subgrade is done by paying the contractor an established hourly rental rate for use of his equipment, with the remaining work paid for on the basis of unit prices for completed work in place. Because of the increased risk and responsibility of the contractors, the cost per kilometer has increased somewhat, but the additional profit motive for the contractors has generated a much higher quality and product while the time required for construction has decreased between 25 percent and 50 percent, resulting in a shorter pipeline and accelerated project implementation. Because of this, this same method of contracting will continue with the addition of plans and specifications included in each contract packet submitted to the prospective bidder. To develop an effective force account capability within the DGC, similar to what the local private sector can provide, would require development of a new institution at high costs and would produce another level of bureaucracy in the GOH with all of the organizational and implementation problems inherent in such an arrangement. It is for this reason that the Mission proposes to contract construction work for Access Roads.

The DGC evaluates all known contractors on a periodic basis, usually once a year, and maintains a list of prequalified contractors. When a new firm is established, it may submit qualifying information to the Ministry at any time, and if deemed qualified subsequent to evaluation, it will be included in the DGC's list of prequalified firms. There are currently 28 prequalified road construction contractors with the equipment and financial capacity necessary to execute the work under this Program. The prequalification procedures employed by the DGC and those used by the IBDR IU, are similar to those used by A.I.D. Past experience with the A.I.D. IU under Loan 025 indicates that contractors respond in numbers to IFB's issued by the IU and do so on a truly competititve basis. In terms of contractor availability, the DGC indicates that a number of the prequalified firms listed need just the type of work required under this Project. (See Annex R for a list of Prequalified Contractors).

It is the intent of the Project to put together contract road packages not to exceed $500,000. Local and regional newspapers will be used for advertisement of Invitation for Bids. In the event that initial contract packages exceed $500,000, Invitation for Bids will be made in the Commerce Business Daily of the U.S. Department of Commerce in accordance with A.I.D. regulations.

At this time, it is the Mission's belief that, given the scope and nature of the technical assistance to be provided under this Amendment, a firm other than one as defined under section 8(a) of the Small Business Act must be contracted to implement the majority of this amended Project.

Nevertheless, and in an effort to comply with the recent legislation concerning the "Minority Set Aside" provision of the Second Continuing Resolution for FY 1985, solicitation of offers to provide this technical assistance will require each offeror to submit an acceptable subcontracting plan to provide opportunities for 8(a) firms to bid on the provision of TA for this Project. If the apparently successful offeror fails to negotiate a subcontracting plan acceptable to the contracting officer within the time limit prescribed by the contracting officer, the offeror will be ineligible for the award. This provision is set forth in Section 19.702 of the Federal Acquisition Regulations.

1. Plans and Specifications. One of the lessons learned in Rural Roads I is that adequate plans and specifications are necessary for the effective communication, coordination and implementation of subprojects. During the initial phases of implementation of Rural Roads I design decisions were made in the field as construction was in progress. There was no pre-construction activity as such that gave enough data to put together an adequate set of plans and specifications for review and approval by the senior engineer. In sum, essentially plans evolved as work progressed. In order to address this problem preconstruction activities now involve collecting field data in sufficient detail to determine material quantities and types of drainage structures needed to meet the standards of road required. This information is used to develop plans, specifications and cost estimates. Prior to advertising the road for bid the plans are taken to the field and verified for completeness and adequacy by a team of engineers. This procedure has already been successfully initiated under Rural Roads I and will be continued in Rural Roads II.

2. Access Road Design and Construction Manual. To facilitate the job of field supervisors, standardize supervision criteria and minimum road specifications and standards, a design and construction manual for all roads to be rehabilitated under the Project, will be developed and be a condition precedent to the disbursement of funds under this Project.

Following is a list of items for which instructions will be included to assist construction Engineering personnel in the administration of the technical aspects of GOH contracts and related facility construction. These are intended to assist the supervisory engineer in obtaining quality work, uniform application of contract requirements, and cooperation with the contractor.

1) Definition of titles.
2) Relationship of GOH/AID to contract line of authority.
3) Supervisor Engineer Responsibilities.
4) Organization of field work:
   a. Project review
   b. Project inspection plan

5) Control of work (contract).
6) Construction specifications.
7) Design changes/contract modification
8) Acceptance of work.
9) Measurement and payment.
10) Records and payments.

3. Road Selection Stages

a. Stage One: Preliminary Road List

SECOPT has prepared a list of proposed roads and trails presently totalling over 3,000 kms. The list was compiled on a department-by-department examination of priority rural road investment needs and will serve as the data base for road sections to be included in the Project.

b. Stage Two: Threshold Criteria

Threshold criteria will be used by TASU to screen and eliminate proposed roads in the office before benefit/cost and engineering studies are undertaken in the field. The TASU will use the data in its data bank to carry-out the desk-top screening. The threshold criteria are:

1) The proposed road segment must connect to an all-weather road network that leads to a regional market. This requirement will be verified by reference to existing detailed maps and verified by SECOPT's knowledge of the actual status of such roads.

2) The majority of the farm population to be served by the proposed road will belong to the target group.

3) Within its area of influence, the proposed road must have an average of at least 10 families per each kilometer-length of road to be improved.

c. Stage Three: Confirmation of Road Location, General Cost Level, and Commitment and Ability of Community to Provide Sufficient Maintenance.

At this stage the SECOPT engineers will conduct a tour of each candidate road segment to confirm the technical road information contained in the request received in Tegucigalpa. Such items as road length, location, relation to other existing all-weather roads, road condition, and cost to improve road to all-weather status will be measured or verified. In addition, the engineers will engage in preliminary discussions with community leaders to determine community interest and ability to organize and provide free labor or monetary contributions, for a reasonable amount of the maintenance costs of the road, if it were improved. The engineers will stress that this is a preliminary step and that no commitment is implied at this time.

d. Stage Four: Economic and Social Analysis

At this stage the TASU will carry-out field studies to measure the financial and economic benefits and costs for each of the candidate road segments. Distances from health and education facilities will be estimated in order to capture the benefits from improved access to these services in stage four. In a like manner, the existence of nearby development projects will be noted.

e. Stage Five: Development of a Final Priority List

To establish the final priority listing from the candidate roads that have made it to this stage, four factors will be given points and weighted: (1) the B/C ratio; (2) average farm size; (3) distance from educational facilities; (4) distance from health facilities; and (5) existence of agricultural development project or facility; (6) Ability to organize and provide hand labor for routine/preventive maintenance. (The final form will be arrived at through discussions between SECOPT and A.I.D. representatives).

f. Stage Six: Final Selection

The final list developed in Stage Five will be presented to the Policy Selection Unit (PSU). The PSU will group the road segments into the "regional road packages" discussed at the beginning of this section. These packages will then be put out to bid and ultimately contracted by local terms.

g. Stage Seven:

The TASU (social promoter) with DGM maintenance engineer confirms commitment in writing for communities to provide routine maintenance. At this stage the promoter and maintenance engineer will return to the communities where projects have been selected and enter into negotiations and signature of maintenance agreement.

E. Administrative/Institutional Analysis

SECOPT was created in 1970 by combining the Ministry of Public Works and Communication and the Ministry of Transportation. Structurally, it is organized into eight separate Directorates General, including the Directorate General of Highways (DGC) and the Directorate General of Maintenance (DGM). Every Directorate has its own administrative and program staffs and its Director reports directly to the Minister of SECOPT.

1. Division of Highways (DGC)

a. Organization

The road rehabilitation component of the project will be implemented by the DGC. The functions delegated to the Division include the regulation, control, and supervision of all activities related to the study, construction,

improvement, and administration of road building activities financed by SECOPT. Staffed by 250 people in 1984, the DGC consists of eleven units. Six of them have responsibilities for normal line functions including planning, project studies, construction, supplies and research and administrative services. In addition, the DGC contains four separate coordination units for projects funded by the IDB, IBRD, A.I.D., and CABEI.

b. Experience with International Financing

The DGC has had extensive experience in working with International Donors.

In the late 1960's, the IBRD financed a series of projects in Honduras designed initially to expand and repair the primary road system. Later, in 1976, the IBRD began to finance rural access roads and trails. The IBRD has since provided financing for over 2,000 kilometers of roads in Honduras, plus related consultants. In addition, the Central American Bank (CABEI) and the Interamerican Development Bank (IDB) have also supported expansions of the primary road system. CABEI has financed a number of major Central American road links including several kilometers in Honduras. With the financing of BID, a series of projects are being completed with a cost of $36.2 millions.

Beginning in 1976, under the Agriculture Sector I Program, the DGC established an A.I.D. Implementation Unit (IU) to coordinate A.I.D. financed road construction programs within the Ministry. (An organization chart for both the DGC and the IU are included as Annex M). The IU provided the engineers who supervised construction of 304 km. of roads under contracts for that Program. In September 1978, the IU assumed responsibility for the construction of narrow dirt roads in more mountainous areas under the Rural Trails Program (A.I.D. Grant 522-0173), consisting of 25 projects totalling 165 km. In 1980, the GOH initiated the Rural Trails and Access Roads under loan (A.I.D. 522-T-035) having reconstructed up to 1984, aproximately 1,000 kms.

c. Management Capability

Since the DGC was formed in 1970, it has supervised construction of 1038 kms of primary and secondary roads, and 2759 kms of dirt surfaced access roads and rural trails. This is in addition to the 2,907 kms of primary and secondary roads built prior to the reorganization of the Ministry.

Over the past 10 years the DGC has earned a reputation for being one of the best managed units within the GOH. This has been achieved by hiring well qualified individuals and basing their promotions on on-the-job performance and academic criteria. The Ministry, with the help of IBRD financed technical assistance, has prepared an Employee Classification and Recruitment Program including employee selection criteria and a fringe benefit program designed to attract and keep highly qualified personnel. In addition, both the IBRD and

IDB have financed technical assistance programs directed at improving the DGC's management capability. In all cases, they are highly qualified and experienced professionals, most of them having many years of service with the Division and with the IU.

As for the DGC's future, the table presented below reflects SECOPT's network of roads and highways in the 1980 maintenance program, plus projections for expansion thru 1984. While the table was developed by the DGM for budget planning purposes, it also reflects program requirements for the DCG. These growth increments are not radically different from those experienced in years past, and should pose no particular problem to the DGC in terms of Project Implementation since it will continue its policy of carrying out road work on a contract basis. (Note that the figures listed below are for those roads to be built by the DGC and included in the DGM's Maintenance Network.)

| | PAVED HIGHWAYS KM. | ALL WEATHER KM. | DRY WEATHER KM. | TOTAL KM. |
|---|---|---|---|---|
| 1980 | 1729 | 3875 | 874 | 6478 |
| 1981 | 1853 | 4097 | 974 | 6924 |
| 1982 | 1949 | 4692 | 1074 | 7715 |
| 1983 | 1997 | 5280 | 1174 | 8451 |
| 1984 | 2054 | 5780 | 1274 | 9108 |

The IU has extensive experience with construction technologies and processes for low-volume, low-cost roads under various types of contractor relationships and community participation, and is currently working working on various methods of rural trail construction involving community participation. Between the four A.I.D. financed projects, a continuum of technologies was used from all community hand labor using only hand tools to construction with heavy equipment supported by smaller numbers of laborers with contractors. As a result, the IU has had practical experience with and gained management skills in the following: costing per kilometer for various low-volume road design and technology mixes choosing effective labor-equipment mixes for different types of terrain and design standards; estimating costs for various drainage structures and appropriate bridge designs; using methodologies for evaluating the economic feasibility of and prioritizing low-volume roads; materials and equipment procurement and community organizing activities related to the construction and maintenance of access roads and rural trails.

As part of the preparation of its Eighth Highway Construction Loan, the IBRD performed an evaluation of the Division of Highways and the Executive Unit responsible jfor implementing its (the IBRD's) projects. The conclusion of that evaluation is that the Division is both technically and administratively strong, and is generally quite capable of administering the projects with which it is charged. The USAID generally supports this conclusion.

REGIONAL OFFICE

Regional Engineers
Project Engineers
Economist
Agronomist
Social Promotor
Analysis Man
Maintenance Inspectors
Earthwork Foremen
Drivers
Timekeepers
Topographers
Level Man
Laborers
Accountant
Secretaries
Messenger

2. Division of Maintenance (DGM)

a. Brief History

The DGM was established along with the Division of Highways in 1970. It did not, however, begin operations as a separate entity until early 1973. The DGM consists of seven departments which include those of the Executive Director, Maintenance, Technical Studies, Equipment and Transport, Administration, Personnel and Training. Together, those departments employ 2770 people, the bulk of them (2580) being field workers.

The functions delegated to the DGM include responsibility for maintaining all of the primary, secondary, and access roads and bridges built by the Ministry of Transportation, Communication and Public Works, or about 9,200 Kms of transport routes in 1984.

b. Experience with External Financing

International donor support of maintenance programs has been irregular since more emphasis traditionally has been placed on highways. Since 1970 not more than $5.0 million has been programmed by the IDB, IBRD and A.I.D. in support of SECOPT's maintenance requirements. In 1970, the IBRD financed a maintenance and equipment operations program, and A.I.D. signed an agreement for approximately $100,000 for courses in maintenance training for SECOPT employees. In 1977, the IDB signed an agreement totalling $1.0 million for maintenance equipment and, in 1976, the IBRD provided $250,000 for technical assistance and training for maintenance activities. The IDB provided the DGM with $2.4 in maintenance equipment and limited technical assistance and training in its second local road loan. As part of its Eighth Roads Loan, the

IBRD provided $11.4 million in funds for the DGM, beginning in mid 1981, that will support the overall maintenance operation. It included $8.0 million for maintenance equipment, $1.0 million for spare parts, and $2.0 million for technical assistance and training. The complete maintenance equipment was purchased by DGM until 1984.

c. Management Capability

Although the Mission has encountered no problems in getting SECOPT and specifically the DGM, to comply with A.I.D. maintenance covenants for its projects, the DGM's track record during the late 1970's in road maintenance has been average at best. Its main problem seems to lie in the area of equipment maintenance. Discussion with, and a reading of literature provided by, IBRD-financed consultants to the DGM indicate that the Equipment and Transport Department of the DGM suffers from a number of administrative ailments including a lack of management know-how, poor organization, a lack of spare parts and an effective system for managing them, and some lingering infrastructure (workshop) problems due to slow construction work. These problems have conspired in the past to keep the DGM working at about 50 percent of its capacity, mainly because of equipment failures. At present, two technicians provided by the IBRD are working with the DGM in attempting to overcome these deficiencies. In addition, as noted earlier, the IBRD's Eighth Roads Loan includes $2.0 million for training and technical assistance. This assistance is specifically designed to address the problems noted above and, in so doing, to reinforce the development and implementation of systems and procedures to improve administrative and operational programs in the maintenance of equipment. Nevertheless, a 1983 evaluation of the Rural Trails and Access Roads Project indicates that maintenance capability of the DGM has improved considerably. Furthermore, SECOPT personnel, in a meeting with USAID Officials have agreed to formally designate a member of pieces of equipment which will be used exclusively to provide maintenance services for roads to be rehabilitated under this Project.

F. Social Considerations

As mentioned in other sections of this PP, the design of this Project, both from a technical as well as social aspect, is largely based upon implementation experience with the Rural Trails and Access Roads I Project. The impact of that Project on the rural communities, has according to a preliminary study, been significant and favorable. Among the results of this Project it should be noted that the rehabilitation and maintenance of roads has:

(1) Farmers can sell their production at the farmgate. This has represented not only savings in previously assumed transportation costs, but also improved bargaining power since production can be sold to middlemen offering higher prices.

(2) The milk industry can operate more efficiently. After the roads have been rebuilt, dairy plants can be assured a permanent supply of milk. Contracts have been signed between processors and producers to the advantage of the latter who now get stable prices for production all year round. Price stability has motivated livestock raisers to begin increasing the size of their herds, thus bringing them to use the land more intensively.

(3) Employment opportunities have developed, and previous losses resulting from the inability to hire labor needed to harvest production have disappeared. In areas where coffee is planted, transportation services for people have been organized. As a consequence, family members of either landless peasants or small farmers have the possibility of travelling back and forth during the same day from their homes to coffee farms. Coffee producers have reported increases from 10 to 20% in the volume of coffee harvested as a result of the timely availability of labor. Temporary laborers picking coffee, on their part, can now earn up to $8.00 per day during the harvest season.

(4) Food basket articles can be acquired at lower prices. After the roads were reconstructed, travelling vendors have access to small communities. They can offer more competitive prices for the mentioned articles than the limited number of stores controlling commercial retail activities.

(5) Both public and private institutions providing services have been able to increase their coverage area. Limited credit, technical assistance, access to agricultural inputs and to health services have been made possible in areas where roads have been rehabilitated.

It is obvious from these findings that reconstruction and rehabilitation of roads can have a significant socio-economic impact even shortly after reconstruction works have terminated. Given these findings and the fact that the incidence of benefits is quantified in the economic section, the following social analysis will be limited to a description of the structure which will be relied upon to provide the support and labor for Project activities.

### 1. Community Participation in the Preventive Maintenance of Roads Reconstructed

#### a. The Role of Patronatos

According to an old law dating from (1906) that regulates the functioning of municipalities, local governments are responsible for the organization and functioning of public services, including the construction and maintenance of public roads. Municipalities, however, have continuously faced financial difficulties and, in most cases, have not been able to comply with those obligations. Autonomous agencies such as INA, SANAA, COHDEFOR and RNP have slowly replaced municipalities in managing services and resources. Due to the lack of inadequate cadaster programs and the limited capacity of most property

owners to pay real estate taxes, particularly in the more rural municipalities in the country, the municipal treasuries cannot depend on property taxes to perform their functions.

Associations of community members, known as "patronatos", have slowly replaced local governments in performing some of the local development functions that the latter have not been able to carry out. In order to promote community participation in the preventive maintenance of roads to be reconstructed under this project, project implementers will seek to organize "patronatos" or obtain the support of those already organized. The eventual success in organizing or mobilizing "patronatos" for this purpose will depend on the promotional strategy that is adopted. This strategy will include mechanisms to: (1) approach communities; (2) initiate the maintenance activities indicated, and (3) insure that they are carried out over the long term according to pre-established maintenance plans.

b. Openness Toward Community Involvement in Preventive Maintenance

Since the project will expand and maintain the rural road network in Honduras, people living in the areas where the project is likely to be implemented have already benefited from access to development poles and service centers in their respective regions. The possibility of re-establishing a lost linkage with these centers will have a two-fold effect. First, it will motivate settlers to lobby for the inclusion of the road going through their community in the list of roads to be reconstructed. And second, it will influence the settlers' predispositions to participate in the maintenance of roads rehabilitated.

In similar projects implemented in the past, the interest expressed by communities in having roads rehabilitated has been one of the criteria utilized to pre-select routes to be reconstructed. This practice will be continued in this project, and promotional activities to either organize or mobilize community involvement in the eventual maintenance of the road will take into consideration existing interests and predispositions. Once an eligible project for reconstruction has been selected, the project promoter will visit all towns located in the road's area of influence. The purpose of this initial visit will be three-fold. First, to inform settlers of the decision made. Second, to detect the availability of local hand labor that could be hired for the reconstruction of the road by contractors hired to do the works so require. And third, to make settlers aware of the need for community involvement in future preventive maintenance activities.

c. Continuous Community Involvement

"Patronatos", both in the urban and rural areas, have tended either to be functional only over short periods of time or to function irregularly. When this tendency is taken into account, the use of "patronatos" to implement a permanent preventive maintenance program could be questioned.

In the past, "patronatos" have had short lives for two reasons. On the one hand, many of them, whether organized by the initiative of community members or under the auspices of development agencies, have been constituted with the purpose of implementing specific projects (e.g., constructing a school or a health center, installing a water system). Once these projects are completed, "patronatos" may enter a period of inactivity which will be overcome only when new community problems arise. On the other hand, there are "patronatos" which have been organized essentially for political reasons. Traditional parties have often organized such associations with the intention of implementing one or various development projects that can improve the party image and can increase the number of party affiliates. In such cases, "patronatos" have been generally promoted by municipalities and, as a consequence, disappear when there is a change of administration.

Under this project, however, the factors affecting the irregular operation of "patronatos" may be controlled. The mechanisms to control these factors and insure the involvement of community members in the maintenance of the road before and after the project's PACD are: (1) timely interventions on the part of the project promoter during the project's life; (2) implementation of a systematic information campaign regarding the status of the project among the different institutions responsible for providing basic social services to the areas where the infrastructure has been improved; (3) implementation of a program to train members in the organization and implementation of collective endeavors; and (4) establishment of adequate linkages with municipalities.

Previous activities related to the promotion of community involvement in road maintenance under Project 522-0164 did not have the anticipated impact mainly because the promoter's field visits were too sporadic. The mobilization of community members for road maintenance purposes should not become a one-time intervention. The promoter will prepare a workplan. This plan will include visits to target communities with the intention of reminding community members of the need to maintain the road. These visits will be made during the dry season in order to avoid maintenance activities interfering with the preparation and/or cultivation of the land.

### d. Project Design and Local Social Structure

The Project has been designed so that local village organizations will have limited responsibility for the reconstruction and primary responsibility for the maintenance of rural roads. The role of the village in access road subprojects is limited to assistance in the identification and recruitment of labor for the road construction firms. Prior to the beginning of reconstruction of the roads, villages will be asked whether they wish to have a road rehabilitated and whether they will participate in construction and maintenance. They will assist contracted contruction companies by providing paid laborers during the construction. There is little doubt that this level of responsibility is feasible. It has been tried and found to be effective. Furthermore, knowledge of the social structure of the region is sufficient to predict that local village patronatos will respond favorably to the approach delineated in the project design.

The maintenance phase, however, is somewhat problematical. Local village organizations will be provided with tools by SECOPT. However, maintenance requires sustained and organized labor efforts, as well as some technical know-how.

The problem of sustained effort has been minimized in the design of the Project. The engineering design reduces the amount of maintenance requirements for the roads to only two man-days per month. Since the selection process for roads guarantees a minimum of 10 families per kilometer of trail (and probably more like 30), the typical roads will require no more than one or two days of labor per year from each able-bodied male in its area of influence. Nevertheless, the mobilization of this labor will require sustained organizational efforts. Patronato organizations are most apt to generate enthusiasm in the village for short bursts of effort on identifiable projects. Sustained maintenance efforts will require a long-term commitment which is more likely to be achieved from the municipal administrative structure. Furthermore, patronatos are village-specific, with few ties between villages whereas the maintenance of roads will require inter-village organization of labor and the determination of the area of responsibility of each village for roads that serve a number of villages. Therefore, it will be necessary for the Project to include agreements with the patronatos and with the municipalities for maintenance. The municipality can achieve intervillage cooperation by organizing and dividing labor among various villages affected by a particular road.

The problem of sufficient local know-how will be addressed by two principal project-developed means. Supervisory engineers from the DGM will perform periodic supervision of road conditions to detect maintenance needs. They will be in communication with the municipal authorities in their areas. Furthermore, the construction firms will, to the extent possible, contract local personnel as foremen during the construction phase, thus providing on-the-job training for individuals who will become the foremen of maintenance crews. The maintenance agreement with municipalities will include provision for naming persons with these acquired skills as maintenance foremen.

### G. Environmental Analysis

The Project will not include construction of new roadways. No penetration roads will be built nor will new areas be opened. All activities will focus on the upgrading and maintenance of existing roadbeds. Accordingly, the potential for direct environmental impact will be limited to clearing of rights-of-way, minimal diversion of drainage patterns and minor levels of dust and/or stream sedimentation during construction. All of these potential impacts will be controlled or avoided through prudent construction practices. For example, the possibility of erosion caused by turn-out construction, roadbed rehabilitation and associated altered drainage patterns will be minimized by seeding and mulching of road shoulders and the installation of small check dams. Bridges and culvert will be designed to allow the free passage of water and avoid disruption of the aquatic plant and animal environment.

The Project's environmental effects are both direct, affecting the improved roads themselves, and indirect, affecting the people and lands served by the roads. Direct effects include such things as reducing erosion of road beds, improving drainage along roads, and eliminating stagnant pools associated with unimproved roads. Indirect effects include increased access to environmental services for rural people and beneficial changes in land use. Anticipated changes in land use include such practices as more intensive cultivation of good land, reduced grazing of marginal lands, and lower incidence of fire.

As was true of Rural Roads I, the Project will rely on an environmental review process to ensure that specific subprojects are environmentally sound. The review process uses a matrix of environmental conditions and proposed subproject actions to compare the expected environmental results of a subproject with the existing state of the environment. If it appears from the matrix that a proposed subproject will have a deleterious effect on the environment that subproject will not be accepted.

To attain uniform application of the environmental review process, the project will conduct one or more seminars on how to apply the process. Subproject evaluation will include an environmental evaluation component to determine how land use has been affected by the subproject. Measures will be taken to alleviate any land use practices that tend to degrade the environment. It should be noted that, while the inspects described above are not so serious as to warrant an environmental assessment (and im fact a negative determination was recommended in the IEE) steps will be taken in the course of the Project to examine the environmetal implications of subsequent work to assume minimal impact at any given work site.

Honduras suffers from a number of environmental problems related to land use and to the human environment. This Project could serve as a vehicle for ameliorative action to these problems.

1. The Environmental Review Process

To assure that ecological concerns are taken into consideration with all Project related upgrading activities an Environmental Review will be a standard component of the selection process. The Review will be carried out in conjunction with economic and social analyses, to be performed for each subproject, to screen and select the roadways to be upgraded or reconstructed.

2. The Environmental Review Document and its Use

The Environmental Review for each construction package will be carried out by means of an Environmental Review Document (ERD). The purpose of the ERD is twofold: 1) the ERD will help subproject evaluators to identify major direct and indirect environmental impacts that might occur in any given subprojects, and 2) the ERD will enable all evaluators to determine which subprojects are unacceptable from an environmental perspective.

The ERD itself will consist of a standard package including cover sheet, instructions for the use of the ERD, a matrix, a sample ERD which has been completed, a section for comments and recommendations to be made by the Natural Resources, etc.) with respect to subproject impact on National Parks or reserves and finally, and a environmental determination (positive or negative) signed by the field evaluator and reviewed by the Administrative Unit in Tegucigalpa.

For each construction package, an insert section will be used to describe in detail the roads to be considered in the Environmental Review. The description will include the number of roadways, their distance, towns or villages connected by the roadways, and a map showing the relationships and locations of the roadways.

## V. A.I.D. MONITORING

A.I.D.'s Engineering Office currently has 9 engineers, including two U.S. Direct Hires, one PASA, two contract engineers and four FSN's.

One of the Direct Hire engineers will be the Project Officer. He/She will be assisted by personnel from the Office of Development Finance in the monitoring of this Project. Nevertheless, the current work load of the Mission is such that it is imperative that the Engineering Office continues to provide partial funding to retain the services of the currently available PASA engineer, who has been the Project Manager for the RRI Project. Consequently, this Project provides $870,000 in Grant funds to finance technical assistance which will include the services of this engineer who will act as A.I.D.'s liaison with and advisor to SECOPT during the implementation of this Project. SECOPT is in agreement with this arrangement.

In addition, these Grant funds will be used for contracting the services of a local hire engineer to assist with the provision of monitoring and liaison services under the Project. Finally, an economist who will assist with and train Honduran counterparts in data gathering for transport costs, agricultural production information and general demographic characteristics in the Project area will also be contracted with these Grant funds.

## VI. IMPLEMENTATION PLAN

### 1. Schedule of Major Events

It is anticipated that Rural Roads II Project will be implemented according to the following schedule:

| DATE | ACTIVITY |
|---|---|
| June 24, 1985 | Project Authorized |
| June 31, 1985 | Project Agreement signed and Implementation Letter No. 1 issued. |
| July 15, 1985 | Conditions Precedent to initial disbursements met. |
| July 30, 1985 | Technical Assistance contracted and underway. |
| August 15, 1985 | SECOPT National Administrative and Technical staff in place. |
| August 15, 1985 | Regional Administrative and Technical staff in place and trained. |
| August 15, 1985 | Architectural designs for four sub-regional engineering offices complete. |
| August 31, 1985 | Bidding documents for commodities procurement complete. |
| September 1, 1985 | Invitation for Bids for commodities published. |
| September 1, 1985 | Begin socio-economic analyses of candidate subprojects. |
| September 1, 1985 | Begin road condition surveys. |
| September 15, 1985 | Begin community organization and training for routine maintenance. |
| October 30, 1985 | Conditions precedent to disbursement for initial maintenance operation met. |
| October 30, 1985 | Award contracts for all commodity contracts. |

| DATE | ACTIVITY |
| --- | --- |
| January 1, 1986 | Receive first delivery of hand tools and equipment. |
| January 15, 1986 | Begin routine maintenance through communities. |
| May 1, 1986 | Four sub-regional engineering centers construction completed. |
| June 1, 1986 | Maintenance audit complete. |
| January 1, 1987 | Mid-term Evaluation complete. |
| January 1, 1989 | Final Project Evaluation |

## VII. PROCUREMENT PLAN

The Project envisages essentially seven procurement actions: the purchase of rural road maintenance tools and equipment, contruction of regional offices, the purchase of regional office administrative and engineering equipment, the purchase of vehicles, the provision of technical assistance in the form of a Project Coordinator and monitors, training and construction contracts and contract evaluations (see Annex K for procurement action schedule).

Technical assistance will be procured with Grant funds and will have its source and origin from a country in either A.I.D. Geographic Code 000 or the host country.

The technical assistance staff of one Project Coordinator and two engineering monitors positions will continue to be established as under predecessor project (0164) with the exception that an economist position will be added to provide training coordination and technical assistance to the three technical assistance selection units in data collection, surveying techniques and analysis.

The tools and equipment necessary for the routine maintenance will be purchased to the extent possible through the USAID/Honduras Rural Technologies Project which will be establishing small tool and equipment fabrication plants throughout Honduras. Tools not available through these means will be purchased locally or imported.

Although the project will have three main regional offices for project implementation there will still be a need for as many as four sub-regional offices in the more remote areas. In these remote areas, building spaces meeting the minimum engineering office standards are not available and structures will need to be constructed using project funds. The required land will be purchased by counterpart funds.

Construction contracts will all be fairly low value, and will be let on an invitation for bid basis, using contractors from a list of 28 local, prequalified contractors held by the DGC. The DGC has let numerous A.I.D. financed construction contracts before, and is thoroughly familiar with A.I.D.'s contract procedures, so this project will present no undue administrative problems.

Evaluations and audits are budgeted at $150,000 and will be arranged on a negotiated procurement basis.

## VIII. EVALUATION PLAN

The evaluation plan for this project will include two evaluations: a midterm evaluation and an impact evaluation.

The midterm evaluation, to be conducted in January 1987, will deal with the following issues: (1) the extent to which established road selection criteria, including consideration of planned or implemented additional AID

interventions, are being applied; (2) the efficiency of the dollar attribution system established by the Project to ensure that importers of spare parts for heavy equipment would have access to needed foreign exchange; (3) the efficiency of paid labor to carry out preventive road maintenance activities; and (4) the commitment of SECOPT to implement the general maintenance management plan developed as part of the Project.

An impact evaluation will be conducted during the last year of the project's life. This evaluation will be based on the baseline data collected during Rural Roads I and that which will be collected under Rural Roads II. Main variables considered for the baseline data collection exercise and the impact evaluation are: migration patterns, agrarian structure, land tenancy, access to services such as credit and technical assistance, agricultural practices and level of farm technology, family participation in agricultural activities, and importance of farm vs. off-farm income.

## IX. CONDITIONS, COVENANTS AND NEGOTIATING STATUS

The Project Committee recommends that the following conditions and covenants be included in the Project Agreement.

### A. Conditions Precedent to Initial Disbursement

Prior to any disbursement or the issuance of any commitment document under the Project Agreement to finance Technical Assistance, the Cooperating Country shall furnish, in form and substance satisfactory to A.I.D.:

a. An opinion of Counsel acceptable to A.I.D. that this Agreement has been duly authorized and/or ratified by, and executed on behalf of, the Borrower/Grantee and that it constitutes a valid and legally binding obligation of the Borrower/Grantee in accordance with all its terms.

b. A statement of the names of the persons holding or acting in the office of the Borrower/Grantee specified in Section 9.c, and a specimen signature of each person specified in such statement.

### B. Conditions Precedent to Additional Disbursements

Prior to any further disbursements or the issuance of any committment documents under the Project Agreement to finance Project Activities, other than technical assistance the Cooperating Country shall furnish in form and substance satisfactory to A.I.D.:

a. Evidence that it has developed a design and construction manual for roads to be rehabilitated under the Project.

b. Evidence that it has developed a process of road selection baed on sound economic, social and evironmental analyses as determined jointly with A.I.D.

c. A Maintenance Management Plan for all roads to be rehabilitated under this Project and the Rural Trails and Access Roads (522-0164) predecesor Project. Most importantly this Plan will:

1) Indicate that the Cooperating Country has established a maintenance budget which includes approximately the Lempira equivalent of $800.00 per kilometer per year, with a commitment to make appropriate adjustment for inflation for future years. A portion of these funds will be used to pay individuals in beneficiary communities for hand labor maintenance.

2) Will establish a system to evaluate, through SECOPT, the rural roads maintenance system on a regular basis and establish alternative maintenance procedures for the roads in the event that rural communities do not provide regular effective maintenance service under the system proposed in the Project Paper.

3) Include all access roads rehabilitated under this Project in the system of roads maintained by the Directorate General of Maintenance of SECOPT, provide that they will be maintained on a regular basis and ensure that maintenance supervisory services will be provided to rural communities which participate in the maintenance of rural roads.

4) Include a budget plan for the provision of the equivalent of not less than Eight Million Three Hundred Sixty Six Thousand United States Dollars ($8,366,000) as the GOH financial contribution to the Maintenance component of the Project.

C. Special Covenants

The Borrower/Grantee further covenants and agrees as follows:

a. That it will cause to be established a mechanism for the Project implementation unit and maintenance personnel to receive their salaries punctually.

b. That it will designate certain specific equipment only for rural road maintenance rehabilitation.

D. Negotiating Status

The development of this Project has been a collaborative process between AID and the Government of Honduras since its inception. Representatives of SECOPT have worked closely with the Mission during all phases of project development. The respective Ministries have been informed of progress in the project development. SECOPT has reviewed and approved the substantive terms and conditions of the Project, and the Minister of Finance and Public Credit formally has requested AID's assistance in carrying out the Project (see Annex A).

Since the Project has the full support of the GOH, no problems are anticipated in negotiating a project agreement.

## LIST OF ACRONYMS USED IN THIS PROJECT PAPER

| | |
|---|---|
| A.I.U. | A.I.D. Implementation Unit |
| CABEI | Central American Bank of Economic Integration |
| CDI/PTR | Centro de Desarrollo Industrial/Proyecto de Tecnologías Rural |
| CDSS | Country Development Strategy Statement |
| COHDEFOR | Corporación Hondurena de Desarrollo Forestal |
| COSUDE | Swiss Development Agency |
| CPM | Critical Path Method |
| DGC | Dirección General de Caminos |
| DGM | Dirección General de Mantenimiento |
| EEC | European Economic Community |
| ERD | Environmental Review Document |
| GDP | Gross Domestic Produce |
| GOH | Government of Honduras |
| IDB | Inter-American Development Bank |
| IFB | Invitation for Bid |
| INA | Instituto Nacional Agrario |
| JEWG | Joint Economic Working Group |
| PP | Project Paper |
| PSU | Policy Selection Unit |
| RMMP | Road Maintenance Management Plan |
| RNP | Registro Nacional de las Personas |
| SANAA | Secretaría Nacional de Acueductos y Alcantarillados |
| SECOPT | Secretaría de Comunicaciones, Obras Públicas y Transporte |
| TASU | Technical Analysis Selection Unit |

# ANNEXES

A. GOH Letter

B. Logical Framework

C. Other Donor Programs

D. Statutory Checklist

E. 611(e) Certification

F. PP Guidance Cable

G. Enviromental Analysis

H. Social Analysis

I. List of Tools Needed

J. Micro-Economic Analysis

K. Procurement Plan

L. Definitions

M. Organization of SECOPT

N. Project Area

O. Estimated Cost of Project

P. Local Construction Firms

Q. Sample Convenio

R. Tentative List of Roads

S. Impact Identification and Evaluation Form

T. Estimated GOH Counterpart Contribution

ANNEX "A"

**SECRETARIA DE HACIENDA Y CREDITO PUBLICO**

**REPUBLICA DE HONDURAS**

Tegucigalpa, D. C.. 18 de junio, 1985 Nº. CP-SF-008

Señor
ANTHONY J. CAUTERUCCI
Director Agencia para el
Desarrollo Internacional
Presente

Señor Director :

Esta Secretaría de Estado en representación del Gobierno de la República de Honduras, solicita a la Agencia para el Desarrollo Internacional (AID) conceda financiamiento hasta por un monto de US$18.685,000.00 y una Donación de hasta US$1.315,000.00 que será utilizado en la ejecución del Proyecto que consistirá en la reconstrucción de aproximadamente 1.000 kms. de caminos de acceso en todo el país incluyendo algunos puentes y el mantenimiento menor de estos caminos.

El Proyecto está considerado como prioritario de acuerdo al Plan Nacional de Desarrollo, tendiente a procurar la reconstrucción y construcción de caminos de acceso a zonas agrícolas, con el propósito de que el Gobierno Central pueda proporcionar una mayor asistencia a las Unidades de Producción a través de los diferentes organismos del Estado.

La dirección del programa en mención es de cuatro años y el costo del mismo se estima en US$26.516.000.00 de los cuales la cantidad de US$6.516.000. será aportado como contraparte con fondos nacionales durante el tiempo de ejecución del Proyecto.

En caso que la Agencia para el Desarrollo Internacional para analizar y resolver favorablemente la presente solicitud, requiera información adicional esta será proporcionada de inmediato y directamente por la Secretaría de Comunicaciones, Obras Públicas y Transporte.

Hago propicia la oportunidad para patentizar al Señor Director, las muestras de nuestra consideración y estima.

RODOLFO MATAMOROS
Subsecretario de Crédito Público
y Administración

CC/GdeC/niv

## LOGICAL FRAMEWORK

| SUMMARY | OBJECTIVELY VERIFIABLE INDICATORS | MEANS OF VERIFICATION | IMPORTANT ASSUMPTIONS |
|---|---|---|---|
| A.1 Goal<br>To increase the income and delivery of social and technical services to the rural small farm family. | A.2 Measurement of Goal Achievement<br>-Increase in productivity by rural families in Project areas as a result of improved access to markets and input supplies.<br>-Expansion of GOH social and technical programs in Project area due to improved access. | A.3 (as related to goal)<br>Community leaders; GOH and private service agencies; field observations. | A.3 (as related to goal)<br>-Honduras will continue on path to democracy after elections in 1985.<br>-GOH Development effort is sustained for 5-10 years. |
| B.1 Purpose<br>1)To institutionalize the rural roads rehabilitation and maintenance capacity within the proper GOH entities. | B.2 End of Project Status<br>1)An additional 50,000 rural families provided with new or improved access roads in all regions of Honduras.<br>2)An increase of 26% by the End-of-Project in the number of kilometers maintained by DGM. | B.3 (as related to purpose)<br>Project progress reports, DGM records; USAID field observations and monitoring reports. | B.3 (as related to purpose)<br>GOH continues to prioritize construction and maintenance of access roads in its planning and budgeting activities.<br>Timely availability of laborers to assist in road improvement and maintenance. |
| C.1 Outputs<br>1)Construction Activity: access roads upgraded bridges constructed.<br>2)Road Maintenance Activity: Access roads maintained Bridges maintained | C.2 Output Indicators<br>1)Approximately 1000 Kms of rural access roads completed with appropriate bridges.<br>2)Maintenance plan for rural access roads developed.<br>-Maintenance being performed in accordance with maintenance plan by communities and DGM. | C.3 (as related to outputs)<br>-Executing units progress reports and joint GOH/AID evaluations.<br>-DGM budget, records and reports, USAID monitoring. | C.3 (as related to outputs)<br>-Weather, labor strikes, availability of construction materials and fuel, and cost increases do not adversely affect progress.<br>-Communities organize to assist in the construction and/or maintenance activities<br>-Sufficient qualified personnel and contractors are available.<br>-Commodities arrive in timely manner. |
| D.1 Inputs<br>1)Construction Activity<br>a. commodities<br>b. construction (roads)<br>c. construction (bridges)<br>2)Road Maintenance Activity<br>a. commodities<br>b. salaries & office space<br>3)Technical Assistance<br>4)Training<br>5)Evaluation | D.2 Budget/Schedule (US$000)<br>135 for vehicles, equipment<br>16,666 for materials, equip. & contracts<br>1,200 " " " " "<br>150 for vehicles, equip., hand tools<br>600 for agency & Proj. specific staff<br>1,015<br>150<br>150 | D.3 (as related to inputs)<br>-Project progress reports<br>-A.I.D. Records | D.3 (as related to inputs)<br>GOH provides adequate budget support for the SECOPT entities involved in this Project. |

## OTHER DONOR PROGRAMS

Following is a summary of the new Road Construction and Highway Rehabilitation Program.

| DONOR | LOCATION/TYPE CONSTRUCTION | LENGTH (Km) | COST ($000s) | STATUS |
|---|---|---|---|---|
| IDB (Old Loans) | Rural Roads-New construction in western Honduras (PRODERO) | 110 | 7,500 | To be finished in April 1985 |
| | Rural Access Roads<br>Paved Highway | 201<br>110 | 27,400 | Started 1980<br>60% complete<br>Finish 1985 |
| | Secondary Roads<br>Forest Zones<br>Sub-base<br>Repave Tela-La Ceiba | <br><br>116<br>103 | 25,200 | Started Sept. 1980<br>Finish Sept. 1985 |
| | Lumber-Mill Roads Olancho<br>Sub-base<br>Pave | <br>172<br>56.5 | 59,500 | Started Jan. 1971<br>Finish April 1985 |
| | SUB-TOTAL | 868.5 | 119,600 | |
| IDB (New loans) | New Costruction<br>Rural Access Roads (Loan amount includes 400 Km of Hand Labor Roads) | 327 | 82,500 | To start in 1985<br>Last three years |
| | Pave Highway between La Ceiba-Jutiapa-Sabá-Olanchito | 123 | 19,000 | To start in 1985 and last 2.5 years |
| | SUB-TOTAL | 450 | 101,500 | |
| CABEI (Old Loans) | Construction Highway between Tegucigalpa and Rio del Hombre | 24 | 12,100 | Started July 1980<br>90% complete<br>Finish April 1985 |
| | Pave Highway La Ceibita to Santa Bárbara | 66 | 16,750 | Started April 1984<br>Finish Dec. 1985 |
| | Highway Sub-base La Paz-Tutule-Marcala | 70 | 17,500 | Started Aug. 1984<br>Finish Feb. 1987 |
| | SUB-TOTAL | 160 | 46,350 | |

| | | | | |
|---|---|---|---|---|
| CABEI (New Loan) | Highway Siguatepeque to Jesus de Otoro | 26 | 13,500 | To be started in 1985 |
| CABEI (Joint Loan) | Rehabilitation Pan-American Highway | 140 | 10,000 | Start 1985 Finish 1987 |
| | Rehabilitation of North Coast Highway | 292 | 40,000 | Start 1985 |

5C(1) - COUNTRY CHECKLIST

Listed below are statutory criteria applicable generally to FAA funds, and criteria applicable to individual fund sources: Development Assistance and Economic Support Fund.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FAA Sec. 481; FY 1984 Continuing Resolution. Has it been determined or certified to the Congress by the President that the government has failed to take adequate measures or steps to prevent narcotic and psychotropic drugs or other controlled substances (as listed in the schedules in section 202 of the Comprehensive Drug Abuse and Prevention control Act of 1971) which are cultivated, produced or processed illicitly, in whole or in part, in such country or transported through such country, from being sold illegally within the jurisdiction of such country, to Unites States government personnel or their dependents or from entering the United States unlawfully?

2. FAA Sec. 620(c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) the debt is not denied or contested by such government?

5C(1) - COUNTRY CHECKLIST

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FAA SEC. 481; FY 1984 Continuing Resolution.
NO

2. FAA Sec. 620 (c).
NO

3. FAA Sec. 620(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?

3. FAA Sec. 620(e)(1).
NO

4. FAA Sec. 532(c), 520(a) 620(f), 620D; FY 1982 Appropriation Act Secs. 512 and 513. Is recipient country a Communist country? Will assistance be provided to Angola, Cambodia, Cuba, Laos, Vietnam, Syria, Libya, Iraq, or South Yemen? Will assistance be provide to Afghanistan or Mozambique without a waiver?

4. FAA Sec. 532(c), 520(a) 620(f), 620D; FY 1982 Appropriation Act Secs. 512 and 513.
NO

5. ISDCA of 1981 Secs. 724, 727 and 730. For specific restrictions on assistance to Nicaragua, see Sec. 724 of the ISDCA of 1981. For specific restrictions on assistance to El Salvador, see Secs. 727 and 730 of the ISDCA of 1981.

5. ISDCA of 1981 Secs. 724, 727 and 730.
N/A

6. FAA Sec. 620 (j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by mob action of U.S. property?

6. FAA Sec. 620 (j).
NO

7. FAA Sec. 620(1). Has the country failed to enter into an agreement with OPIC?

7. FAA Sec. 620(1).
NO

8. FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5. (a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters?

(b) If so, has any deduction required by the Fishermen's Protective Act been made?

8. FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5.
NO

(b)
NO

9. FAA Sec. 620(q); FY 1982 Appropriation Act Sec. 517. (a) Has the government of the recipient country been in default for more than six months on interest or principal of any A.I.D. loan to the country? (b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the appropriation bill appropriates funds?

9. FAA Sec. 620(q); FY 1982 Appropriation Act Sec. 517.
NO

10. FAA Sec 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the amount of foreign exchange or other resources which the country has spent on military equipment? (Reference may be to the annual "Taking into Consideration" memo: "Yes, taken into account by the Administrator at time of approval of Agency OYB." This approval by the Administrator of the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)

10. FAA Sec 620(s).
YES

11. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

11. FAA Sec. 620(t).
NO

12. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the A.I.D. Administrator in determining the current A.I.D. Operational Year Budget? (Reference may be made to the Taking into Consideration memo.)

12. FAA Sec. 620(u).
Honduras is not in arrears to the extent described in Article 19 of the U.N. Charter.

13. FAA Sec. 620A; FY 1982 Appropriation Act Sec. 520. Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed an act of international terrorism? Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed a war crime?

13. FAA Sec. 620A; FY 1982 Appropriation Act Sec. 520.
NO

14. FAA Sec. 666. Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA?

14. FAA Sec. 666.
NO

15. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing, equipment, materials, or technology, without specified arrangements or safeguards? Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device, after August 3, 1977? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan.)

15. FAA Sec. 669, 670.
NO

16. ISDCA of 1981 Sec. 720. Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Session of the General Assembly of the U.N. of Sept. 25 and 28, 1981, and failed to disassociate itself from the communique issued? If so, has the President taken it into account? (Reference may be made to the Taking into Consideration memo.)

16. ISDCA of 1981 Sec. 720.
This has been taken into consideration by the Administrator at the time of approval of the Agency OYB.

17. ISDCA of 1981 Sec. 721. See special requirements for assistance to Haiti.

17. ISDCA of 1981 Sec. 721.
N/A

18. FY 1984 Continuing Resolution. Has the recipient country been determined by the President to have engaged in a consistent pattern of opposition to the foreign policy of the United States?

18. FY 1984 Continuing Resolution.
NO

B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria.

a. FAA Sec. 116. Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy?

2. Economic Support Fund Country Criteria

a. FAA Sec. 502B. Has it been determined that the country has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, has the country made such significant improvement in its human rights record that furnishing such assistance is in the national interest?

b. ISDCA of 1981, Ec. 725(b). If ESF is to be furnished to Argentina, has the President certified that (1) the Govt. of Argentina has made significant progress in human rights; and (2) that the provision of such assistance is in the national interests of the U.S.?

c. ISDCA of 1981, Sec. 726(b). If ESF assistance is to be furnished to Chile, has the President certified that (1) the Govt. of Chile has made

B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria.

a. FAA Sec. 116.
The Department of State has not determined that Hondura violates human rights.

2. Economic Support Fund Country Criteria

a. FAA Sec 502B.
N/A

b. ISDCA of 1981, EC. 725(b).
N/A

c. ISDCA of 1981, Sec. 726(b).
N/A

significant progress in human rights; (2) it is in the national interest of the U.S.; and (3) the Govt. of Chile is not aiding international terrorism and has taken steps to bring to justice those indicted in connection with the murder of Orlando Letelier?

5C(2) PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A includes Criteria applicable to all projects. Part B applies to projects funded from specific sources only: B.1. applies to all projects funded with Development Assistance Funds, B.2. applies to projects funded with Development Assistance loans, and B.3. applies to projects funded from ESF.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT

CR Sec. 133. Notwithstanding any other provision of this joint resolution, none of the funds appropriate under section 101 (b) of this joint resolution may be available for any country during any 3-month period beginning on or after October 1, 1982, immediately following the certification of the President to the Congress that such country is not taking adequate steps to cooperate with the United States to prevent narcotic drugs and other controlled substances (as listed in the schedules in section 202 of the Comprehensive Drug Abuse and Prevention Control Act of 1971 (21 U.S.C. 812)) which are produced, processed, or transported in such country from entering the Unites States unlawfully."

A. GENERAL CRITERIA FOR PROJECT

1. FY 1982 Appropriate Act Sec. 523; FAA Sec. 634A; Sec. 653(b).

(a) Describe how authorizing and appropriations committees of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million oer that amount)?

1. FY 1982 Appropriate Act Sec. 523; FAA Sec. 634A; Sec. 653(b).

(a)
Congress has been informed of A.I.D.'s intention to obligate funds in a Congressional Notification sent in January 1984.

2. FAA Sec. 611 (a) (1). Prior to obligation in excess of $100,00, will there be (a) engineering, financial or other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

2. FAA Sec. 611 (a) (1).
YES

3. FAA Sec. 611 (a) (2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

3. FAA Sec. 611 (a) (2).
No further legislative action required.

4. FAA Sec. 611 (b); FY 1982 Appropriation Act Sec. 501. If for water or water-related land resource construction, has project met the standards and criteria as set forth in the Principles and Standards for Planning Water and Related Land Resources, dated October 25, 1973? (See A.I.D. Handbook 3 for new guidelines.)

4. FAA Sec. 611 (b); FY 1982 Appropriation Act Sec. 501.
N/A

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?

5. FAA Sec. 611(e).
YES

6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.

6. FAA Sec. 209.
Project activities not appropriate for a regional or multilateral Project.

7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, and credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

7. FAA Sec. 601(a).
The Project will be implemented through the contracts to the private sector and foster private initiative through providing financial and technical assistance to local entrepreneurs. It is expected that the roads constructed with this Project will result in greater domestic and international trade, thereby reducing monopolitic practices.

8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise.)

8. FAA Sec. 601(b).
U.S. suppliers will play a significant role in the provision of many Project related commodities.

9. FAA Sec. 612(b), 636(h); FY 1982 Appropriation Act Sec. 507. Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.

9. FAA Sec. 612(b), 636(h); FY 1982 Appropriation Act Sec. 507. Honduras has agreed to provide counterpart financing of local costs.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?

10. FAA Sec. 612(d). The U.S. does not own excess Honduran currency.

11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?

11. FAA Sec. 601(e). YES

12. FY 1982 Appropriation Act Sec. 521. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?

12. FY 1982 Appropriation Act Sec. 521. N/A

13. Faa 118(c) and (d). Does the project comply with the environmental procedures set forth in A.I.D. Regulation 16? Does the project or program take into consideration the problem of the destruction of tropical forests?

13. FAA 118(c) and (d). YES
A.I.D. environmental regulations have been followed in the design of this Project.

14. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditures of project funds (dollars or local currency generated therefrom)?

14. FAA 121(d).
N/A

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria.

a. FAA Sec. 102(b), 111, 113, 281(a). Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward a better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria.

a. FAA Sec. 102(b), 111, 113, 281(a).
The Project will invol;ve the poor in development by actively seeking their participation in this Project.

b. FAA Sec. 103, 103A, 104, 105, 106. Does the project fit the criteria for the type of funds (functional account) being used?

b. FAA Sec. 103, 103A, 104, 105, 106.
YES

c. FAA Sec. 107. Is emphasis on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)?

c. FAA Sec. 107.
An analysis of the most appropriate labor/machine mix has been done for this Project.

d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)?

d. FAA Sec. 110(a).
YES
Honduras will contribute at least 25%.

e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"? (M.O. 1232.1 defined capital project as "the construction, expansion, equipping or alteration of a physical facility or facilities financed by A.I.D. dollar assistance of not less than $100,000, including related advisory, managerial and training services, and not undertaken as part of a project of a predominantly technical assistance character."

e. FAA Sec. 110(b).
NO

f. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?

f. FAA Sec. 122(b).
YES
The Project will contribute to increased agricultural marketing opportunities for the rural poor.

g. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government.

g. FAA Sec. 281(b).
The Project is in concert with Honduras' development plan.

2. Development Assistance Project Criteria (Loans Only)

a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, at a reasonable rate of interest.

b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

c. ISDCA of 1981, Sec. 724(c) and (d). If for Nicaragua, does the loan agreement require that the funds be used to the maximum

2. Development Assistance Project Criteria (Loans Only)

a. FAA Sec. 122(b).
Honduras is capable of compying with the soft loan terms contained in the Project Agreement.

b. FAA Sec. 620(d).
N/A

c. ISDCA of 1981, Sec. 724(c) and (d).
N/A

extent possible for the private sector? Does the project provide for monitoring under FAA Sec. 624(g)?

3. Economic Support Fund Project Criteria

a. FAA Sec. 531(a). Will this assistance promote economic or political stability? To the extent possible, does it reflect the policy directions of FAA Section 102?

b. FAA Sec. 531(c). Will assistance under this chapter be used for military, or paramilitary activities?

c. FAA Sec. 534. Will ESF funds be used to finance the construction of the operation or maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified that such use of funds is indispensable to nonproliferation objectives?

d. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?

3. Economic Support Fund Project Criteria

a. FAA Sec. 531(a).
N/A

b. FAA Sec. 531(c).
N/A

c. FAA Sec. 534.
N/A

d. FAA Sec. 609.
N/A

5C(3) - STANDARD ITEM CHECKLIST

Listed below are the statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. PROCUREMENT

1. FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed?

2. FAA Sec. 604(a). Will all procurement be from the U.S. except as otherwise determined by the President or under delegation from him?

3. FAA Sec. 604(d). If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company?

4. FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.)

A. PROCUREMENT

1. FAA Sec. 602.
Normal A.I.D procedures will be followed.

2. FAA Sec. 604(a).
YES

3. FAA Sec. 604(d).
Honduras does not practice such discrimination.

4. FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a).
N/A

5. FAA Sec. 604(g). Will construction or engineering services be procured from firms of countries otherwise eligible under Code 941, but which have attained a competitive capability in international markets in one or more of these areas?

5. FAA Sec. 604(g).
NO

6. FAA Sec. 603. Is the shipping excluded from compliance with requirements in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent that such vessels are available at fair and reasonable rates?

6. FAA Sec. 603.
Shipping is not excluded from he requirements.

7. FAA Sec. 621. If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? If the facilities of other Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

7. FAA Sec. 621.
YES
Facilities of other Federal agencies will not be utilized.

8. International Air Transport. Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available?

8. International Air Transport. Fair Competitive Practices Act, 1974.
YES

9. FY 1982 Appropriation Act Sec. 504. If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States?

9. FY 1982 Appropriation Act Sec. 504.
YES

B. Construction

1. FAA Sec. 601(d). If capital (e.g., construction) project, will U.S. engineering and professional services be used?

B. Construction

1. FAA Sec. 601(d).
1. No. Under A.I.D. Procurement Guidelines, contracts under $500,000 in value need not be advertised in the U.S.

2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?

2. FAA Sec. 611(c).
YES

3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed $100 million (except for productive enterprises in Egypt that were described in the CP)?

3. FAA Sec. 620(k).
N/A

C. Other Restrictions

1. FAA Sec. 122(b). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?

C. Other Restrictions

1. FAA Sec. 122(b).
YES

2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?

2. FAA Sec. 301(d).
N/A

3. FAA Sec. 620(h). Do arrangements exists to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries?

3. FAA Sec. 620(h).
YES

4. Will arrangements preclude use of financing:

a. FAA Sec. 104(f); FY 1982 Appropriation Act Sec. 525: (1) To pay for performance of abortions as a method of family planning or to motivate or coerce persons to practice abortions; (2) to pay for performance of involuntary sterilization as a method of family planning, or to coerce or provide financial incentive to any person to undergo sterilization; (3) to pay for any biomedical research which relates, in whole or part, to methods or the performance of abortions or involuntary sterilization as a means of family planning; (4) to lobby for abortion?

4.

a. FAA Sec. 104(f); FY 1982 Appropriation Act Sec. 525:
Arrangements preclude the use of funds for this purpose.

b. FAA Sec. 620(g). To compensate owners for expropriated nationalized property?

b. FAA Sec. 620(g).
Arrangements preclude the use of funds for this purpose.

c. FAA Sec. 660. To provide training or advice or provide any financial support for police, prisons, or other law enforcement forces, except for narcotics programs?

c. FAA Sec. 660.
Arrangements preclude the use of funds for this purpose.

d. FAA Sec. 662. For CIA activities?

d. FAA Sec. 662.
Arrangements preclude the use of funds for this purpose.

e. FAA Sec. 636(i). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside the U.S., unless a waiver is obtained?

e. FAA Sec. 636(i).
Motor vehicles purchased will be of U.S. source and origin.

f. FY 1982 Appropriation Act. Sec. 503. To pay pensions, annuities, retirement pay, or adjusted service compensation for military personnel?

f. FY 1982 Appropriation Act. Sec. 503.
Arrangements preclude the use of funds for this purpose.

g. FY 1982 Appropriation Act, Sec. 505. To pay U.N. assessments arrearage or dues?

g. FY 1982 Appropriation Act, Sec. 505.
Arrangements preclude the use of funds for this purpose.

h. FY 1982 Appropriation Act, Sec. 506. To carry out provisions of FAA section 209(d) (Transfer of FAA funds to multilateral organizations for lending)?

h. FY 1982 Appropriation Act, Sec. 506.
Arrangements preclude the use of funds for this purpose.

i. FY 1982 Appropriation Act, Sec. 510. To finance the export of nuclear equipment, fuel, or technology or to train foreign nationals in nuclear fields?

i. FY 1982 Appropriation Act, Sec. 510.
Arrangements preclude the use of funds for this purpose.

j. FY 1982 Appropriation Act, Sec. 511. Will assistance be provided for the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights?

j. FY 1982 Appropriation Act, Sec. 511.
NO

k. FY 1982 Appropriation Act, Sec. 515. To be used for publicity or propaganda purposes within U.S. not authorized by Congress?

k. FY 1982 Appropriation Act, Sec. 515.
Arrangements preclude the use of funds for this purpose.

ANNEX E

CERTIFICATION PURSUANT TO 611(e) OF THE
FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, Carl H. Leonard, acting as the principal officer of the Agency for International Development in Honduras, having taken into account, among other factors, the maintenance and utilization of projects in Honduras previously financed or assisted by the United States, do hereby certify that, in my judgement, Honduras has both the financial capability and human resources capability to effectively maintain and utilize the Project: RURAL ROADS PROJECT II.

Carl H. Leonard
Acting Mission Director
USAID/Honduras

Date: July 1, 1985

ACTION: AID-2 INFO: AMB DCM ECON SA/6 (2)

VZCZCTG0202
PP RUEHTG
DE RUEHC #4847/01 3360324
ZNR UUUUU ZZH
P 010318Z DEC 84
FM SECSTATE WASHDC
TO AMEMBASSY TEGUCIGALPA PRIORITY 3883
BT
UNCLAS STATE 354847

LOC: 318 828
01 DEC 84 1337
CN: 35980
CHRG: AID
DIST: AID

AIDAC

E.O. 12356: N/A
TAGS:
SUBJECT: HONDURAS PP GUIDANCE RURAL ROADS II (522-0214)

1. THE DAEC FOR THE RURAL ROADS II PID WAS HELD NOVEMBER 14, 1984. THE FOLLOWING GUIDANCE IS OFFERED AS ASSISTANCE IN THE PREPARATION OF THE PROJECT PAPER.

2. CLARIFICATION OF CONTRACTING PROCEDURES: THE PP SHOULD CLEARLY INDICATE THE ANTICIPATED METHOD FOR CONTRACTING SERVICES FOR THE PROJECT. IT SHOULD CLARIFY THAT IN NO CASE WILL AID FUNDS BE USED AS AN ADVANCE TO THE CONTRACTOR. IT SHOULD ALSO BE CLEARLY STATED THAT EACH CONTRACT WILL BE LIMITED TO A MAXIMUM VALUE OF DOLLARS 500,000. CONTRACTING TERMS SHOULD BE MODIFIED TO READ QUOTE ANY ELIGIBLE FIRMS UNQUOTE WITH ELIGIBILITY DEFINED AS CACM PARTICIPANT COUNTRIES.

3. SPARE-PARTS PURCHASING: PROVIDING FX FOR SPARE-PART PURCHASES SHOULD BE FULLY EXPLAINED IN THE PP, INCLUDING A DISCUSSION OF THE ALTERNATIVE MECHANISMS WHICH WERE CONSIDERED. THE DISCUSSION SHOULD INCLUDE AN ANALYSIS OF THE MERITS AND POSSIBLE USE OF LOCAL CURRENCY (RATHER THAN PROVIDING DOLLARS) FOR SPARE-PARTS. THE PROJECT PAPER SHOULD CLEARLY INDICATE THAT AID STANDARD SOURCE-ORIGIN REQUIREMENTS WILL BE FOLLOWED ALONG WITH ALL OF THE AID STANDARD PROVISIONS. ADDITIONALLY, THE USE OF QUOTE REGULAR DEALERS UNQUOTE AND QUOTE SUPPLY CERTIFICATES UNQUOTE SHOULD BE CLEARLY INDICATED. AID PROJECT MANAGEMENT SHOULD NOT BE CHARGED WIT QUOTE FOLLOWING THE USE OF SPARE PARTS UNQUOTE PURCHASED UNDER THE PROJECT.

4. FUND USEAGE: DETAILED EXPLANATIONS REGARDING THE METHODOLOGY AND RATIONALE FOR THE QUOTE REVOLVING FUND UNQUOTE AND THE QUOTE ADVANCE FUND UNQUOTE SHOULD BE DESCRIBED AS PART OF THE PROJECT'S IMPLEMENTATION PROCEDURE. IN ADDITION, THE NATURE AND EXTENT OF EXPOSURE OF THE AID CONTRIBUTION IN BOTH MECHANISMS SHOULD BE ANALYZED AND CLEARLY DESCRIBED IN THE PP EMPHASIZING THAT ONLY COUNTERPART FUNDING WILL BE USED FOR THE QUOTE ADVANCE FUND UNQUOTE. THE RISK TO AID FUNDS INHERENT IN THE CONTRACTING PROCESS MUST BE

IDENTIFIED AND DETAILED.

5. MAINTENANCE CONCERNS: THE PP SHOULD INCLUDE A FULL DISCUSSION OF THE CONTEMPLATED MAINTENANCE PLANS AND THE CONCOMITANT LEVERAGE AID WILL BE ABLE TO APPLY TO ASSURE POST-PROJECT MAINTENANCE. THE SCOPE OF COMMUNITY INVOLVEMENT IN MAINTENANCE MUST ALSO BE DETAILED. THE PP SHOULD ALSO EXAMINE THE RELATIONSHIPS AND STRUCTURES OF THE VARIOUS ORGANIZATIONS CHARGED WITH OVERSEEING THE MAINTENANCE. THE NEED FOR PROJECT ACTIVITIES TO STRENGTHEN SEPCOT AND OTHER INSTITUTIONS SHOULD BE DISCUSSED. SPECIFICALLY, THE CAPABILITIES OF SEPCOT AND OTHER IMPLEMENTING SUB-ORGANIZATIONS SHOULD BE THROUGHLY EXPLORED WITH PROJECT ACTIVITIES FOR STRENGTHENING THOSE INSTITUTIONS INCLUDED IN THE PP DISCUSSION.

6. APPROPRIATE CAPITAL-LABOR MIX: THE DIFFICULTY IN DICTATING A SPECIFIC CAPITAL-LABOR MIX TO THE PROJECT'S PRIVATE CONTRACTORS WAS RECOGNIZED BY THE DAEC. NEVERTHELESS, THE MISSION SHOULD CONDUCT AN ECONOMIC COMPARISON OF THE CAPITAL-LABOR MIX ANTICIPATED TO BE USED BY A CONTRACTOR ON A TYPICAL ROAD SEGMENT WITH AN ECONOMICALLY OPTIMAL CAPITAL-LABOR MIX. THIS ANALYSIS WILL INDICATE THE COSTS TO THE HONDURAN ECONOMY OF CHOOSING A PARTICULAR MIX BY DEMONSTRATING THE REDUCTION IN NET BENEFITS THROUGH THE USE OF A NON-OPTIMAL MIX. IN THE EVENT OF POTENTIALLY HIGH ECONOMIC LOSS, THE MISSION SHOULD EXAMINE POSSIBLE MECHANISMS WHICH LEAD TO A MORE ECONOMICALLY OPTIMAL SELECTION OF TECHNOLOGY. AT THE

SAME TIME, HOWEVER, THE COMPARATIVE ANALYSIS SHOULD DETERMINE ANY INCREASES IN THE FINANCIAL COSTS TO THE CONTRACTOR OR TO THE GOH WHICH ARE ASSOCIATED WITH THE ADOPTION OF A MORE ECONOMICALLY-OPTIMAL MIX. THE COMPARISON SHOULD INDICATE THE DIFFERENCES IN THE FINANCIAL COSTS THAT THE GOH WOULD INCUR. THE PP SHOULD INCLUDE ANALYSES WHICH COMBINE THESE VARIOUS MIXES AND PRESENT THEM IN CONJUNCTION WITH THE THREE JUSTIFICATIONS CONTAINED IN THE PID. THOSE JUSTIFICATIONS, WHICH INDICATE THAT AN INORDINANTLY HIGH LABOR-INTENSIVE MIX IS NOT NECESSARILY THE MOST APPROPRIATE ONE, WILL PROVIDE A STRONG AND WELL-BALANCED ARGUMENT FOR WEICHEVER MIX IS CHOSEN.

7. ECONOMIC ANALYSES: SINCE THE ECONOMIC ANALYSIS CONDUCTED FOR THE ORIGINAL 1980 RURAL ROADS PP NOW APPEARS OVERLY COMPLICATED, IT IS RECOMMENDED THAT THE MISSION ADOPT A NEW METHODOLOGY FOR THIS PROJECT. LAC/DR ECONOMIST, BEN SEVERN, WILL POUCH 3 DOCUMENTS WHICH PROVIDE STATE-OF-THE-ART METHODOLOGIES AND EXAMPLES FOR YOUR USE. IN ADDITION, SOME EX POST CASE STUDIES OF



BEST AVAILABLE COPY

90

AGRICULTURAL DEVELOPMENT RESULTING FROM THE IMPROVEMENT OF ROADS UNDER THE FIRST PROJECT SHOULD BE INCLUDED IN THE ECONOMIC ANALYSIS.

8. SEVERN, WHO HAS DEVELOPED A SIMPLIFIED ECONOMIC MODEL FOR ROAD PROJECTS, IS PREPARED TO SPEND 1-2 WEEKS ON TDY TO ASSIST THE MISSION IN THE PREPARATION OF THE DESIGN, METHODOLOGY AND COLLECTION OF THE NECESSARY DATA. PLEASE ADVISE IF ASSISTANCE IS NEEDED.

9. ENVIRONMENTAL CONSIDERATIONS: IN GENERAL, THE MISSION IS COMMENDED ON ITS UNDERSTANDING AND PROPOSED APPROACH TO HANDLING THE POTENTIAL ENVIRONMENTAL IMPACTS. CONSEQUENTLY, THE IEE WILL BE APPROVED SUBJECT TO THE FOLLOWING RECOMMENDATIONS. IT IS FELT THAT THE PARTICIPATION OF THE REGIONAL ENVIRONMENTAL MANAGEMENT SPECIALIST, FRANK ZADROGA, ON THE PP DESIGN IS NECESSARY. HIS ROLE SHOULD INCLUDE THE INTEGRATION OF THE IEE RECOMMENDATIONS INTO THE FINAL DESIGN OF THE PROAG. ADDITIONALLY, THE PP SHOULD INCLUDE AN ANALYSIS WHICH INDICATES THE PROJECT'S IMPACT ON POPULATION MOVEMENTS IN THE TARGETED AREAS.

11. AUDIT RESULTS: THE MISSION SHOULD CONSIDER ANY PERTINENT RECOMMENDATIONS PROVIDED BY THE AUDIT CURRENTLY BEING CONDUCTED ON THE RURAL ROADS PROJECT. SHOULD THE ADOPTION OF ANY RECOMMENDATION RESULT IN A SIGNIFICANT MODIFICATION IN THE PROJECT PURPOSE AID/W SHOULD BE

ADVISED BY CABLE.

12. REDELEGATION OF PP APPROVAL AUTHORITY: THE ASSISTANT ADMINISTRATOR, LAC, HAS GRANTED THE MISSION DIRECTOR, USAID/HONDURAS THE AUTHORITY TO APPROVE THE PROJECT PAPER.
SHULTZ



BEST AVAILABLE COPY

ANNEX G

# ENVIRONMENTAL ANALYSIS

## ENVIRONMENTAL ASPECTS OF AID/HONDURAS RURAL ROADS II PROJECT

### SUMMARY

The Rural Roads II Project, like Rural Roads I, will concentrate on improving existing trails and roads in settled, rural areas.

The Project's environmental effects are both direct, affecting the improved roads themselves, and indirect, affecting the people and lands served by the roads. Direct effects include such things as reducing erosion of road beds, improving drainage along roads, and eliminating stagnant pools associated with unimproved roads. Indirect effects include increased access to environmental services for rural people and beneficial changes in land use. Anticipated changes in land use include such practices as more intensive cultivation of good land, reduced grazing of marginal lands, and lower incidence of fire.

As was true of Rural Roads I, the Project will rely on an environmental review process to ensure that specific subprojects are environmentally sound. The review process uses a matrix of environmental conditions and proposed subproject actions to compare the expected environmental results of a subproject with the existing state of the environment. It it appears from the matrix that a proposed subproject will have a deleterious effect on the environment that subproject will not be accepted.

To attain uniform application of the environmental review process, the project will conduct one or more seminars on how to apply the process. Subproject evaluation will include an environmental evaluation component to determine how land use has been affected by the subproject. Measures will be taken to alleviate any land use practices that tend to degrade the environment.

Honduras suffers from a number of environmental problems related to land use and to the human environment. This Project could serve as a vehicle for ameliorative action to these problems.

### Relationship of Rural Roads II to Rural Roads I

Rural Roads II stems directly from Rural Roads I and carries forward from it the same environmental features. Just as Rural Roads I did, Rural Roads II will improve existing trails and roads; the Project will not entail construction of new roads. The roads that Rural Roads II will improve pass through settled lands and lead to existing settlements. This was true of Rural Roads I also.

## Environmental Backdrop for the Project

Most of the land affected by the Rural Roads II Project supports a complex array of land use practices. The land itself tends to have very variable quality and productive capacity. Land quality changes markedly over short distances. Typically, the land is hilly with very little level land. Slopes vary from moderate to extreme. Soils vary in fertility, depth and susceptibility to erosion. Ordinarily better soils occur on level or gently sloping land, whereas the steeper slopes support poorer soils.

The most intensive and most productive land use occurs on the best land. Here, mixed annual crops, perennial crops, tree crops and confined livestock raising thrive. Often one observes that stable agroforestry has developed on these lands and will probably continue.

Most steep, poor land is also used, however, often beyond its capacity, so that its low productivity actually decreases over time and probably will continue to do so. People farm the hillsides, mainly to grow corn, Honduras' basic subsistence crop. They also graze the hillsides, mostly with cattle, but also with goats. Finally, the hillsides support scrubby forests which yielded their best timber long ago, but which continue to provide firewood, fence posts, wood for crude construction and some lumber for furniture and housing.

Much of the land, especially the hillsides used for cultivation and grazing, is burned frequently, usually annually. Burning makes it easier to clear and prepare land for cultivation. It also promotes growth of tender pasture. Ashes from the burning add quick-release nutrients to the soil. But burning provokes erosion, reduces diversity of plants and animals, and destroys humus. In the long run, frequent wide-spread burning does not enhance land quality but causes land to deteriorate.

The lands affected by Rural Roads II have been settled for some time. Their population appears stable. Improvement of access by the project will probably not attract new settlers; probably it will not promote out-migration either.

## Direct Environmental Aspects of the Project

The Project's direct environmental aspects are associated with the roads themselves. The unimproved roads that the project will improve lack proper drainage. When it rains, the roads themselves serve as channels in which run-off flows. This erodes the roads so that material from the roadbeds washes into streams. Contaminants from the road surface - oil, gasoline, other chemicals and wastes - wash into streams also. Stream crossings on existing roads are unimproved. They are usually muddy, uneven fords into which contaminants drop from passing vehicles. Bad drainage of existing roads causes water to accumulate in stagnant pools which breed mosquitoes and other insects and serve as sinks for human waste and other pollutants.

By designing and constructing road improvements with environmental considerations in mind, the project will alleviate current bad conditions. The philosophy of the project is that sound engineering and sound environmental practices go hand in hand. Roads improved under the project

will have hard, compacted surfaces that resist water penetration and erosion. Drainage ditches will quickly carry water away from road surfaces, channelling it, with culverts where necessary, to the natural drainage system of streams. Large stream crossings will be improved with bridges and fords at smaller streams will be reinforced with rock and concrete, eliminating the existing wallows. The new road drainage systems will also eliminate other stagnant pools associated with the current roads.

## Indirect Environmental Aspects of the Project

The first level of indirect environmental aspects of the project affects the people whom the improved roads will serve. Improved roads will allow services to travel in to the people and will allow people to travel out to services. From an environmental perspective, important services will include medical services as well as those related to disease control, household water supply, family and public sanitation, and food handling and storage. As a result of the project, project beneficiaries should not only obtain improved access to these services, they should have more money to buy them and, eventually, better information with which to choose among them.

The second level of indirect environmental aspects of the project affects the land reached by the improved roads. One underlying assumption of the project is that, when access improves, small farmers will increase production. Increased production will rely on increased inputs and more intensive land use. This scenario should hold true on good land. Farmers will put more time, labor and inputs into their best land which has the greatest capacity for increased productivity. In areas where the proportion of good land to poor land is fairly high, concentration of farmer effort on good land could reduce pressure on poor land. Cultivation, overgrazing, and burning of slopes would decrease; forest and other natural vegetation would become more vigorous; erosion would slacken; and long-term, but low-level productivity of these poor, hilly lands, would be maintained. Productivity on the good lands will have increased from the increased inputs it has received.

Where the ratio of good land to poor land is very low, however, the happy situation just described might not occur. Farmers would still attempt to increase productivity, but in the absence of sufficient good land, they would direct their efforts toward poor land. More slopes would be cultivated; fallow periods would shorten; burning, with attendant erosion and damage to forests, would not abate; already degraded land would be grazed well beyond its sustainable capacity. Under this set of events, positive effects of the project would be short-lived. Production would go up for a while but soon it would fall and, after not too many years, project beneficiaries would be worse off then they started.

## The Project's Environmental Review Process

Rural Roads I examined the direct and indirect environmental aspects of proposed subprojects by way of a formal environmental review process. This process will continue under Rural Roads II.

The environmental review process operates by application in the field of a matrix of environmental indicators. Ten existing environmental conditions are listed along the left side of the matrix and ten proposed subproject actions are listed across the top. Each of the 100 boxes in the matrix is divided diagonally allowing insertion of two numbers in each box. In the upper left half of each box the environmental reviewer inserts a number that indicates the status of each existing condition before the subproject. A number that indicates the anticipated status of each condition after the subproject is inserted in the lower right half of each box. All the numbers for existing conditions before the subproject are summed and so are all the numbers for anticipated conditions after the project. The two totals are compared as the ratio of pre-existing conditions to anticipated conditions. This ratio is then converted to percent. To be approved a subproject must attain at least 75% on the environmental review matrix. That is environmental deterioriation anticipated by the subproject cannot exceed 25%. Sometimes, proposed subprojects do not attain the required 75%. They do get rejected, then, on environmental grounds. Often, however, anticipated improvements in environmental conditions are great enough to produce review results that exceed 100%. That means the reviewer believes performance of the subproject will make environmental conditions better than they would be without the project.

The environmental review matrixes come with definitions and instructions to the reviewer. Nonetheless, they are applied in the field by each reviewer rather subjectively. Under Rural Roads I, some informal comparisons of reviews using the matrixes showed that different reviewers obtain different results. It would be possible in a close case for one reviewer to approve a subproject and another reject it.

Rural Roads II will attain a greater uniformity in the environmental review-process by holding a seminar, lasting two or three days, on application of the review process. The seminar will bring the different people who perform the reviews together in the field to apply the review process to several actual proposed subprojects. Using the proposed subprojects as models, the seminar participants will discuss each environmental condition and each proposed action to reach consensus on what each means and how to determine it on the ground. The seminar could also evoke suggestions for changes in the matrix components or the methodology for applying them. If the Seminar is successful, it might be repeated a few times during the life of the project.

Periodic evaluation of Rural Roads II and its subprojects will include environmental evaluation. This evaluation will compare actual environmental condition in a subproject area a year or two after completion of the subproject with the anticipated environmental condition set out in the matrix for the subproject. Where actual environmental conditions after the subproject show significant deterioration, the project will bring environmental services to the subproject area. These services will come from sources outside the project, e.g., from the Ministry of Health for public health services, from the Ministry of Agriculture for soil conservation services.

Rural Roads I took special precautions with subprojects that passed near parks or reserves or through forest production lands. These subprojects, which form a small fraction of the total, are not approved or executed except with the concurrence and coordination of the Honduran Park Service of Forest Service. This practice of special attention to these subprojects will continue under Rural Roads II.

Relationship of Rural Roads II to General Environmental Conditions in Honduras.

General environmental conditions in Honduras are not good. Land resources are not used as effectively as they could be both from overuse of much poor land and from underuse of some good land. Depleted forest resources are not being replaced and forest lands that cannot sustain grazing or agriculture are being cleared and put to these uses. Uncontrolled fire degrades croplands, grazing lands, and forest lands in much of the country. Wild life resources have become impoverished, largely through destruction of habitat, and there will be no improvement in their condition until habitat improves through better land use. Virtually all surface water sources are contaminated, mostly from human wastes, but also from industrial and agricultural wastes.

These conditions will only improve through long-term, concerted national efforts to improve them. Such efforts could include any or all of the following actions:

- national environmental education;
- classification of land throughout the country in accordance with its productive use capacity, i.e., agriculture, grazing, forestry, or protection;
- land use in conformity with land use capability;
- soil conservation;
- fire control;
- forest management;
- range management;
- wildlife management;
- watershed management;
- establishment, protection and management of parks and reserves;
- management of fisheries and coastal resources;
- water pollution control;
- control of toxic substances;
- air quality control

Good performance of Rural Roads II would facilitate most of these actions. Because Rural Roads II deals directly and indirectly with human and land resources in rural Honduras it could turn into the vehicle for one or more actions oriented toward rural lands. Land use capability classification would be a good place to start as would soil conservation, fire control, or watershed management.

Evaluation of Rural Roads II, specially the evaluations near its completion, should specifically investigate what kinds of conservation projects would be most feasible and most beneficial as follow-on projects.

ANNEX H

# SOCIAL ANALYSIS

## Introduction

This analysis will deal with two main questions. First, the socio-economic impact roads may have. And second, the involvement of community members in the preventive maintenance of roads reconstructed. When discussing the first question, findings of recent field trips to visit roads rehabilitated under Project 522-0164 will be presented. The discussion of the second question will take into account: (a) the socio-economic variables that may affect community involvement in maintenance activities, and (b) the results of similar experiences implemented by other development agencies. The main premise guiding the discussion of community involvement in maintenance activities is that for behavior to take place appropriate responses must be initiated, adequately learned and sustained over time. The last section of this paper presents the conclusions and recommendations resulting from the analysis.

## Socio-Economic Impact of Reconstructed Roads

### a. Background

The roads visited for the purpose of this analysis had been rehabilitated from 12 to 15 months previous to the field trip.

Some of the farmers interviewed were referred to us either by the SECOPT engineer that had participated in the construction of the roads or by community leaders contacted upon arrival to towns visited. Others lived alongside the roads and were selected at random.

Roads visited had been reconstructed in an area where farmers grow basic grains and coffee and raise cattle. Among the farmers contacted, land use is determined both by farm size and area where the farm is located. For the purposes of this discussion small farmers are defined as those who cultivate less than 10 hectares, medium-sized farmers are those that cultivate less than 50 hectares, and larger farmers are those that cultivate over 100 hectares. Small farmers in the lower lands are essentially basic grain growers (e.g., corn and beans), but their counterparts in the highlands cultivate both basic grains and coffee. In some cases, farmers within this size category are also beginning to cultivate cardamom. Medium-sized farmers, on the other hand, cultivate basic grains but are more specialized. They are essentially livestock raisers when farms are located in the lowlands and coffee growers when farms are located in the highlands. Finally, all larger farmers visited have their farms in the lowlands and are mainly livestock raisers. Some of the larger farmers have other sources of income. In these cases, they are either merchants or professionals living in nearby towns.

Main Findings

Findings of the visit paid to this area can be summarized as follows.

(a) Previous to the rehabilitation of the road, farm production used to be transported from the farm to the main highway or to nearby market towns by mules. This situation has totally changed for the majority of farmers visited. At present, middlemen come to the different villages to buy the production. Since prices of most farm goods are generally the same both at the farmgate and in nearby market towns, farmers opt to sell their harvest at the farm. The drudgery previously experienced in trying to get basic grains and coffee to market using mules has now disappeared. In addition, the new marketing system that has developed following the rehabilitation of roads allows producers to save the transportation cost of farm goods to the previous market place. Given their meager cash incomes, this change has especially benefited basic grain growers. Depending on the distance to be travelled and the price paid for goods, transportation costs previously paid could range from 10% to 15% of the market price of a 200-pound sac of corn. Small basic grain growers no longer have to assume these costs.

(b) As a consequence of the road being reconstructed, employment opportunities have been created and production previously lost can now be harvested. Medium-sized farmers growing coffee can now hire the necessary hand labor for harvesting all of their production. On the one hand, before the road was rehabilitated, the isolation of farms discouraged potential workers from participating in the coffee harvest. These workers, mainly women and adolescents, preferred to return home every night after work. The reconstruction of roads has permitted the organization of transportation services for people. Workers can now travel about 30 kms. back and forth between their residence and the farms where they are employed. Family members of either landless peasants or small farmers living in the lowlands can now make up $8.00 per day picking coffee. When the road was unpassable and hand labor was not available, medium sized coffee growers could not harvest all of their production as a substantial amount of ripe coffee berries would fall off the branches and rot on the ground.

(c) Livestock raisers have also benefited from the rehabilitation of roads. On the one hand, those that are mainly milk producers have been able to become permanent milk suppliers. They can take out their production on a regular basis both in the dry and in the rainy season. This situation has allowed them to affiliate to a cooperative selling milk to one of the country's most important milk processing plants. The affiliation to this cooperative permits farmers to obtain stable prices for their production all year round. Before the road was rehabilitated, milk was sold to local cheese producers who would pay $0.20 per liter in the rainy season and $0.26 per liter in the dry season. Currently, farmers

affiliated with the cooperative are obtaining $0.24 per liter all year round. Stabilization of prices has motivated some producers to consider and realize small scale increases in their herd size. For livestock raisers that have mainly beef cattle, on the other hand, the rehabilitation of the roads has allowed them to be in a better bargaining position with respect to buyers. Before the road was rehabilitated, the number of buyers was restricted and producers were selling their herd at prices set by those controlling the market. This situation has now changed and cattle are being sold to buyers that offer the better prices.

(d) Before the roads were rehabilitated under Project 0164, food basket articles used to be sold only by a reduced number of rather large "pulperias" that existed in the area visited. Store owners set up their own prices for these articles, and it has been argued that for certain commodities there were important price differences between these products and similar ones brought in nearly market towns. Since the roads were reconstructed, however, itinerant vendors pay regular visits to the different communities located alongside the roads. These vendors tend to offer the same products at more competitive prices. This situation has forced some of the store owners in the area to try to reduce their prices to the level offered by the vendors.

(e) After the roads were rehabilitated, public and private sector institutions have extended services to the area visited. CONSUPLANE has implemented the PRODERO Project in some of the towns located alongside reconstructed roads. Through this project, participating farmers are being provided technical assistance, agricultural inputs, and home improvement materials. Both the inputs and the home improvements materials are being provided on accessible terms. IHCAFE has also started implementing the Small Farmer Coffee Improvement Project in the area. Small coffee producers have been taken on field trips to visit demonstration plots to show the advantages of technification. Nursery activities have also been initiated. Furthermore, the Ministry of Health has started a latrinization program in one of the communities visited, and PRASAR has already started the installation of a water system in the same town. A rural health center has recently opened in another community, and a nurse working in the area has argued that the rehabilitation of roads has facilitated the work of vaccination brigades that recently visited the field as part of a national immunization program. Finally, a multiple services cooperative financed under an AID project has been paying visits to previously isolated communities trying to motivate farmers to affiliate and have access to services provided. These services include credit, agricultural inputs, technical assistance and marketing.

### 3. Beyond the Facts

It is obvious from the previous discussion that the re-construction of roads may have significant socio-economic impact even short after the reconstruction works have ended. In the area visited, the rehabilitation of roads has played an important role in: (a) reducing previous price differentials between regional marketplaces and isolated towns both for basic grains and food basket products; (b) permitting farmers to save previously assumed transportation costs for farm goods from the farm to regional marketplaces; (c) permitting coffee growers to harvest all of their production; (d) permitting milk producers to obtain stable prices for their production and as a consequence use land more intensively; (e) permitting beef cattle producers to obtain better prices for their livestock; and (f) increasing seasonal jobs for family members. It has also made possible the extension of various services by both public and private sector development agencies to the newly connected towns.

The field visit also revealed two additional conclusions. On the one hand, once roads are reconstructed, those farmers already well established with respect to land and capital, benefit the most from the improved infrastructure. Formal credit, technical assistance to technify and/or diversify production, and improved marketing channels need to be made available to the smaller producers so that some of the socio-economic benefits caused by the rehabilitation of roads will also reach them. Formal credit, technification and improved marketing outlets are particularly important for small coffee growers. Once roads were rehabilitated, these producers began accepting production credit from middlemen with the condition that the harvest be delivered to the latter. Middlemen set the price of production when the informal credit transactions are carried out. This price may be as much as 15% less than what it would be obtained if production were to be sold during the harvest. Since this type of credit is made available for a period ranging from two to three months, the terms of loans made are detrimental to the farmers' income. The second conclusion when findings are interpreted is that additional credit and technical assistance for basic grain production greater than that already being provided is necessary.

Improved infrastructure is instrumental to development and should not be considered as an end in itself. Impact of road rehabilitation will be magnified when it is connected with other development interventions implemented by public and private sector institutions, financed or not by AID.

## C. Community Participation in the Preventive Maintenance of Roads Reconstructed

### 1. The Role of Patronatos

According to an old law dating from (1906) that regulates the functioning of municipalities, local governments are responsible for the organization and functioning of public services, including the construction and maintenance of public roads. Municipalities, however, have continuously faced financial difficulties and, in most cases, have not been able to comply with those obligations. Autonomous agencies such as INA, SANAA, COHDEFOR and RNP have

slowly replaced municipalities in managing services and resources. Due to the lack of inadequate cadaster programs and the limited capacity of most property owners to pay real estate taxes, particularly in the more rural municipalities in the country, the municipal treasuries cannot depend on property taxes to perform their functions. The income base of municipalities is often limited to local taxes levied on community members exercising given professions and to fees charged for certain services rendered, including the rental of stands at marketplaces. In some cases, the subsidies awarded by the central government to municipalities is the only source of income that allows them to operate. A recent study of 16 municipalities located in the border departments with El Salvador concluded, for example, that if central government subsidies received by these municipalities had not been made available, local governments would not have even had the needed resources to pay the salaries of their staff.

Associations of community members, known as "patronatos", have slowly replaced local governments in performing some of the local development functions that the latter have not been able to carry out. In contrast to the urban based "patronatos" which tend to be more militant in nature, rural "patronatos", as pointed out by Zûniga (1979), are organized with the purpose of soliciting and/or managing funds made available by public or private development agencies to construct, improve, expand or maintain public utilities and needed infrastructure. In order to promote community participation in the preventive maintenance of roads to be reconstructed under this project, project implementors could either seek to organize "patronatos" or obtain the support of those already organized. The eventual success in organizing or mobilizing "patronatos" for this purpose will depend on the promotional strategy that is adopted. This strategy will include mechanisms to: (1) approach communities; (2) initiate the maintenance activities indicated, and (3) insure that they are carried out over the long term according to pre-established maintenance plans.

2. Openness Toward Community Involvement in Preventive Maintenance

Since the purpose of the project is to expand and maintain the rural road network in Honduras, people living in the areas where the project is likely to be implemented have already benefited from access to development poles and service centers in their respective regions. The possibility of re-establishing a lost linkage with these centers will have a two-fold effect. First, it will motivate settlers to lobby for the inclusion of the road going through their community in the list of roads to be reconstructed. Secondly, it will influence the settlers' predispositions to participate in the maintenance of roads rehabilitated.

In similar projects implemented in the past, the interest expressed by communities in having roads rehabilitated has been one of the criteria utilized to pre-select routes to be reconstructed. This practice will be continued in this project, and promotional activities to either organize or mobilize community involvement in the eventual maintenance of the road will take into consideration existing interests and predispositions. Once an eligible project for reconstruction has been selected, the project promoter will visit all towns located in the road's area of influence. The purpose of this initial visit will be three-fold. First, to inform settlers of the decision made; second, to detect the availability of local hand labor that could be hired for the reconstruction of the road by contractors hired to do the works so require; and third, to make settlers aware of the need for community involvement in future preventive maintenance activities.

## 3. Initial Community Mobilization: Some Intervening Factors and Possible Intervention Strategies

If the interest manifested by communities in the reconstruction of infrastructure previously used all year round could constitute the basis for the promotion of community involvement particularly in road maintenance, the eventual mobilization of community members to perform may depend on other variables. These variables may be: agro-economic, demographic, ecological and informational/educational. There are at least five factors that may intervene and affect actual community performance: (1) the prevailing land tenure system in the area and the resulting income base of settlers; (2) the dominant settlement pattern; (3) the population size of benefiting communities; (4) the time when maintenance activities must be carried out; and (5) the information community members may have regarding the road sections where preventive maintenance is crucial and their capacity to perform the tasks required.

Based on the above reasoning, we can argue that the mobilization of community members for preventive maintenance activities will be easier when settlers are farmers whose income comes mainly from on-farm activities; when there are several towns alongside the road and each community can assume the responsibility of maintaining only certain sections of the road; when the size of these towns permits the formation of road maintenance teams; when the maintenance activities do not concide with prevailing agricultural pursuits; and when settlers have access to needed maintenance tools, can use them and know what road sections under their maintenance jurisdiction need special attention. When the opposite situation is present, however, community mobilization will be more difficult. That is, it will be harder in regions characterized by the prevalence of minifundismo and share-cropping where peasants rely heavily on their off-farm income; when the distribution and compliance with maintenance assignments may be limited either by the presence of a dispersed settlement pattern or the concentration of the population at the end of the road; and when settlers, even when having needed maintenance tools, ignore how and where the maintenance activities must be carried out.

Under optimal conditions, one of the main responsibilities of the promoter will be the organization of the maintenance teams and the assignment of maintenance responsibilities to them. Under opposite conditions, however, the interventions on the part of the promoter will require additional planning and follow-up. If the majority of settlers that could participate in the preventive maintenance program have a rather low income, and if their involvement in this program precludes them from obtaining temporary employment off the farm, project implementors must offer incentives to insure that necessary maintenance activities are carried out. Incentives offered must compensate for potential income losses that their involvement in the preventive maintenance program could suppose. Food for work programs to carry out similar activities have been implemented by other international donors, especially in highly poverty sricken areas. These experiences have had positive results, particularly when coordination between donors has existed. This coordination has required agencies implementing different types of projects (e.g., health, home improvement, infrastructure) to avoid either concomitant interventions or offering food rations of different sizes for similar work shifts. In order to avoid creating unnecessary expectations in other areas where poverty is less generalized, promoters must clarify to

participants that food for work programs are implemented for equity reasons alone and only after a socio-economic profile of the area has been prepared. The direct and indirect benefits of this project, as well as those of others that may be implemented once roads are reconstructed, may change the income base of an important portion of those micro-farmers who are now forced to complement their revenue with off-farm activities. If this occurs, flexibility in project implementation should exist. This flexibility should permit the determination of the possibility of food for work programs in support of road maintenance activities provided that an evaluation indicates that this can be done.

Cases of either population concentration in one settlement at the end of a reconstructed road or of exceptional dispersion of inhabitants alongside rehabilitated routes will create logistical and organizational problems which project implementors must be able to solve. With respect to the first situation, the provision of transportation to the road sections where maintenance must be carried out could be required. The DGC or the DGM must see that this transportation is provided. In the second situation, the project promoter must establish zones of intervention, organize maintenance teams accordingly and assign maintenance responsibilities.

During his initial visits to communities benefiting from project activities, the project promoter must gather information regarding the capacity of settlers to carry out the preventive maintenance tasks required to keep the road usable all year round. The promoter must avoid assuming that the apparent simplicity of anticipated preventive maintenance tasks eliminates the need for any type of training at all. The identification of training needs must be done based on a road maintenance plan that could be prepared both by the road reconstructors and the reconstruction supervisor. Furthermore, it is advisable that this training not be limited to road miantenance per se. Both to provide immediate benefits to potential participants in maintenance teams and to obtain a stronger commitment on their part with respect to the maintenance of the infrastructure rehabilitated, the training plan should also include courses in basic construction techniques. These courses could allow settlers to acquire the necessary elementary skills to improve their homes in case they desire to do so. The project's financial plan should include the necessary provisions to implement the training program that could be designed once training needs are identified.

Finally, it is important to keep in mind that communities are composed of different socio-economic groups. Given this heterogeneity, it is possible that the professional/occupational activities in which some community members may be involved could preclude them from getting directly involved in maintenance tasks. Project managers will have to design mechanisms that can make it feasible for monetary and in-kind contributions from these community members to be collected and adequately utilized.

4. Continuous Community Involvement

"Patronatos", both in the urban and rural areas, have tended either to be functional only over short periods of time or to function irregularly. When this tendency is taken into account, the use of "patronatos" to implement a permanent preventive maintenance program could be questioned.

In the past, "patronatos" have had short lives for two reasons. On the one hand, many of them, whether organized by the initiative of community members or under the auspices of development agencies, have been constituted with the purpose of implementing specific projects (e.g., constructing a school or a health center, installing a water system). Once these projects are completed, "patronatos" may enter a period of inactivity which will be overcome only when new community problems arise. On the other hand, there are "patronatos" which have been organized essentially for political reasons. Traditional parties have often organized such associations with the intention of implementing one or various development projects that can improve the party image and can increase the number of party affiliates. In such cases, "patronatos" have been generally promoted by municipalities and, as a consequence, disappear when there is a change of administration.

Under this project, however, the factors affecting the irregular operation of "patronatos" may be controlled. The mechanisms to control these factors and insure the involvement of community members in the maintenance of the road before and after the project's PACD are: (1) timely interventions on the part of the project promoter during the project's life; (2) implementation of a systematic information campaign regarding the status of the project among the different institutions responsible for providing basic social services to the areas where the infrastructure has been improved; (3) implementation of a program to train members in the organization and implementation of collective endeavors; and (4) establishment of adequate linkages with municipalities.

Previous activities related to the promotion of community involvement in road maintenance under Project 522-0164 did not have the anticipated impact mainly because the promoter's field visits were too sporadic. The mobilization of community members for road maintenance purposes will not become a one-time intervention. The promotor will prepare a workplan. This plan will include visits to target communities with the intention of reminding community members of the need to maintain the road. These visits must be made during the dry season in order to avoid maintenance activities interfering with the preparation and/or cultivation of the land. On the other hand, promotors may play an important liaison role between benefited communities and the public and private institutions that could extend their services to them. It should be the promoter's responsibility to directly and systematically inform these institutions of the status of te rehabilitation works. The need to provide the information directly to the pertinent institutions stems from the inefficiency observed in similar interventions in the past where such data was provided to a centralized agency in charge of planning and coordinating the provision of services within the public sector. Furthermore, the promoter must realize that his work will be of limited duration, despite the need for permanent community involvement in maintenance activities. He must be aware of the fact that maintenance teams must continue to operate beyond the PACD. With this in mind, he must train "patronato" members to establish development priorities, to organize and mobilize local resources, and to define needs and lobby for support from both public and private sector development institutions. Last but not least, the intervention strategy on the part of the promoter must also include the development of adequate linkages between "patronatos" and municipalities. Since municipalities are permanent local institutions with the legal responsibility of maintaining public roads, it is only logical that whenever possible they coordinate with "patronatos" in

implementing preventive road maintenance programs. Despite their financial limitations, municipalities still have the recognized authority to summon citizens to participate in community development programs, including road maintenance. This recognized authority could be of great use for project implementation.

Once the importance of "patronato"-municipality linkages is recognized, what remains to be defined is who is to have the initiative in implementing the preventive maintenance program that may be eventually designed. There are municipalities with a long reputation of being committed to local development just as there are municipalities known for a marked degree of inactivity. It is our recommendation that in the first case promoters take advantage of tradition and rely on existing commitments to implement the maintenance program. In the second case, the implementation initiative should correspond to the "patronatos".

"Patronatos" organized for political reasons will represent a challenge to project implementers. When they exist, it is advisable that a special independent road maintenance team be organized. To outlive changes in the local government structure, this team should bring together community members of different political tendencies.

5. The Role of the Promotor

a. Previous Experience and Advantages of the Present Strategy

The design of previous A.I.D. financed road reconstruction projects has included promotion activities to get communities involved both in the reconstruction and maintenance of roads. As indicated above, these activities did not have the expected effects since they were implemented by either Peace Corps volunteers or promoters hired by SECOPT but not directly linked to the A.I.D. Executing Unit within DGC. The lack of this institutional linkage made it difficult, if not impossible, to effectively coordinate the promotion of community involvement with the reconstruction works. Peace Corps Volunteers carried out their promotional activities too much in advance to the actual reconstruction of roads, and in some cases these activities were implemented in communities where existing roads were never rehabilitated. Promoters hired by SECOPT, for their part, were characterized by erratic interventions and little continuity in their work if any. The present project promoters will be hired directly by the DGC. Through this mechanism, the coordination between reconstruction and promotional activities is likely to improve.

b. The Need for an Intervention by Stages

We have already discussed some of the problems that will be confronted by promoters and the way in which they can be handled. Our suggestions will be now be presented in an integrated fashion with the intention of providing guidelines for the elaboration of a systematic workplan for project promoters. The basic premise behind these suggestions is that promoters will be involved in promotional activities from the beginning of project implementation and that their interventions will be carried out in stages.

During the first stage, the promoter must make a reconnaissance trip to pre-selected communities where the project could be implemented. During this visit, the promoter must inform settlers about the purpose of the project and at the same time collect basic socio-economic data regarding the characteristics of the area visited. Information collected must allow the promoter to accomplish two objectives. First, to determine if communities are eligible project beneficiaries; and second, to gather the first evaluative elements regarding an eventual intervention to mobilize community members for road maintenance purposes.

During the second stage, if it has been determined that community members can be involved in the reconstruction works, the promoter could proceed to organize reconstruction squads. He could also take advantage of the occasion to make a more in-depth structural analysis of communities. This analysis should allow him to design a detailed strategy to mobilize settlers to participate in the maintenance of roads. That is, the needs for training for food for work programs, the linkages that need to be developed between "patronatos" and local governments, and the possibility of collecting monetary and in-kind contributions from wealthier community members can be all identified at this time.

During the third stage, the training of community members may be initiated if the need to do so has been detected. Maintenance activities per se will also begin to take place during this stage. At this time, the promoter must make sure that public and private sector institutions that can extend their services to the newly reconnected areas are aware of the status of project activities.

During the last stage, the promoter must undertake road maintenance follow-up activities to insure that communities understand and are committed to preventive road maintenance and that needed tasks can be implemented with minimum outside intervention. As part of the strategy to assure the continuous performance of maintenance teams, promoters must design a mechanism to set the example and publicly recognize community members characterized by their outstanding interest in the implementation of the preventive maintenance plan conceived.

## D. Summary and Conclusions

### 1. Socio-Economic Impact

(a) In one area visited, the reconstruction of roads has contributed to : (i) the reduction of previous price differentials between regional marketplaces and isolated towns both for basic grains and food basket products; (ii) the savings of transportation costs of farm products from the farm to regional marketplaces previously assumed by producers; (iii) the complete harvest of coffee production obtained by middle sized coffee growers; (iv) the access to stable prices all year round for milk producers and the subsequent interest in increasing the size of herds and in using the land more intensively; and (v) the increment in seasonal jobs in agriculture for women and adolescents. It is expected that similar accomplishments can be achieved through this project.

(b) Despite impact pointed out, socio-economic benefits generated by road construction projects can be reaped much easier by larger farmers given their access to land, capital and technology. For benefits to equally reach small farmers, they need to have access to formal credit, technical assistance to technify and/or diversify production and improved marketing outlets. Private and public sector institutions often implement projects that provide these services to small farmers in the same areas where roads are rehabilitated. Some of these projects are financed by A.I.D., others are not. To insure magnification of project impact, particularly in the case of small producers, improved coordination of development interventions is needed, independently of who funds them. Project implementers must be aware of the fact that roads are instrumental to development and should not be considered an end in itself. If this fact is not recognized, instead of fostering growth with equity, roads could contribute to maintain prevailing socio-economic disparity in the countryside.

2. Road Maintenance

(a) "Patronatos" constitute an adequate mechanism to involve community members in the preventive maintenance of roads.

(b) Members of communities benefited by the project will show their willingness to participate in preventive maintenance activities as a consequence of the fact that these tasks will allow them to regain a lost benefit: their linkage with regional development poles.

(c) It is necessary to distinguish the openness of community members with respect to road maintenance activities from the actual mobilization of the population to carry them out.

(d) There is not one but various valid strategies to mobilize community involvement in road maintenance. The strategy adopted must be in accord with existing socio-economic characteristics of towns where the mobilizaion must take place. It should be the promoter's responsibility to prepare the profile of the region where this mobilization will take place and to define the strategy suitable to accomplish project objectives.

(e) In those areas where the incidence of minifundismo and sharecopping prevail, the mobilization of community members is likely to require the use of incentives similar to those employed in food for work projects. To insure that roads maintenance activities are carried out in these areas, the necessary linkages with the Food for Peace Program must be incorporated in project design.

(f) To reinforce the commitment that community members benefiting from the project may have with respect to road maintenance activities, training programs implemented should not be limited to roads maintenance tasks per se. Such training programs

should also include courses on basis construction techniques. This training should allow community members to acquire the necessary skills to improve their homes, if they desire to do so.

(g) Project implementers must design mechanisms to allow community members that cannot directly participate in maintenance tasks to make monetary and in-kind contributions. Adequate mechanisms must be designed and incorporated into the project to insure that these contributions are properly managed and utilized.

(h) The promotional strategies implemented under this project must include activities allowing for preventive maintenance tasks are carried out continuously, even beyond the project's PACD.

Besides timely interventions on the part of promoters to mobilize community members on an annual basis so that maintenance activities are carried out, it is also necessary to: (i) link the project with other development interventions; (ii) train "patronato" members in the management of their association and in the planning and implementation of collective endeavors, and (iii) establish adequate linkages with local governments.

(i) The promoter's intervention must be designed in stages. the type of activities to be carried out will vary from stage to stage.

(j) Institutionalize the system of publicly recognizing community members characterized by their outstanding contribution/interest in the road maintenance program.

(k) Project design must include mechanisms to prevent that the morale of promoters and the promotional activities themselves are affected by the personnel management problems characteristic of the Hondudran public sector.

(l) Members of benefiting communities are likely to be open to the signature of agreements formalizing their commitment with maintenance activities. However, these agreements will represent a moral rather than a legal obligation.

Consequently, compliance can only be enforced at the outset of project implementation. To make moral obligations become convictions, promotional activities must be carried out permanently during the project's life.

(m) Agreements must be signed both by municipalites and "patronatos".

ANNEX I

## LIST OF TOOLS NEEDED

### Hand Tools - Maintenance

A. Preventive Maintenance

- Road surface patching
- Repairs and conformation of drainage ditch
- Cleaning and/or repair of culverts and retaining walls, R-O-W brushing.

B. Typical Crew and Equipment

| Crew | | Equipment | |
|---|---|---|---|
| 1 | Foreman | 2 | wheel barrows |
| 13 | Laborers | 5 | shovels R.P.L.H. |
| | | 8 | picks |
| | | 2 | steel bars |
| | | 2 | sledge hammers 10# |
| | | 3 | machetes |
| | | 10 | files |
| | | 4 | chisel |
| | | 2 | axes |
| | | 1 | set mason tools |
| | | 1 | cart or gravel spreader |
| | | 1 | 3-wheeled freight bycicle |

Maintenance rate = 100.00 L.M./day/road crew

C. Total Labor and Hand Tools Needs

For 2,000.00 kilometers, 80 road crews per year are needed.

| Crew | | Equipment | |
|---|---|---|---|
| 80 | Foremen | 160 | wheel barrows |
| 1040 | Laborers | 400 | shovels R.P.L.H. |
| | | 640 | picks |
| | | 160 | steel bars |
| | | 160 | sledge hammers 10# |
| | | 240 | machetes |
| | | 800 | files |
| | | 320 | chisel |
| | | 160 | axes |
| | | 80 | set mason tools |
| | | 80 | carts or gravel spreader |
| | | 40 | 3 wheeled bicycle carts |

D. COST

ESTIMATED UNIT PRICE

| Hand Tools | Quantity | Estimated Unit Price ($) | Total (US$) |
|---|---|---|---|
| Wheel barrows | 160 | 100.00 | 16,000.00 |
| Shovels R.P.L.H. | 400 | 7.50 | 3,000.00 |
| Picks | 640 | 6.00 | 3,840.00 |
| Steel bars | 160 | 19.00 | 3,040 00 |
| Sledge Hammers 10# | 160 | 20.00 | 3,200.00 |
| Machetes | 240 | 5.00 | 1,200.00 |
| Files | 800 | 1.00 | 800.00 |
| Chisel | 320 | 2.50 | 800.00 |
| Axes | 160 | 15.00 | 2,400.00 |
| Set mason tools | 80 | 22.50 | 1,800.00 |
| Cart or gravel spreader | 80 | 150.00 | 12,000.00 |
| 3-wheeled bicycle cart | 40 | 500.00 | 20,000.00 |
| Miscellaneous, spare parts | | | 19,920.00 |
| | | Grand Total | $100,000.00 |

ANNEX J

# MICRO ECONOMIC ANALYSIS

## Methodology Employed in the Benefit/Cost Analysis

### 1. General Methodology

When rural access road improvement reduces spoilage, wastage, and increases the quality, and reduces the transportation cost, and existing production, the analysis is straightforward and unambiguous because these benefits are clearly the direct result of two cost items: road improvement and maintenance costs. However, when the road improvement also leads to extra lands being brought into production and possibly to increased productivity, the road costs cannot be said to be totally responsible for these increased benefits because agricultural input costs are obviously needed to actually effect increased production benefits.

For this Project we assume that no new infrastructure costs such as increased agricultural extension or agricultural bank staffs will be needed to obtain the increased production. We do expect, however, that there will be an increase in the use of inputs such as fertilizer, seeds, equipment and labor in order to obtain the additional production. These extra costs will be included in the post-road farm budgets and will be listed as separate cost items along side the construction, administration, and maintenance costs in the denominator of the Benefit/Cost equation and expressed algebraically as (Farms)(dTC). The basic elements, of the general methodology are listed below.

a. The time horizon of the benefits attributable to an individual road is projected annually over a 10 year period after completion of the road improvement.

b. At the 10th year, a residual value is assigned to the roads, culverts, bridges, etc.

c. Economic rather than financial concepts are appropriate.

d. The with and without concepts of project analysis are utilized.

e. The value of outputs and inputs is based on current baseline information and is kept constant throughout the life of a given road project. This procedure makes the assumption that relative prices for the various road benefits and costs will be constant over the ten-year benefit time horizon.

f. Incremental benefits include among others:

- the value of increased production due to more lands brought under cultivation;

- the value of increased production due to the induced increase in productivity on old lands and new lands over the ten year period;
- the value of the reduction in spoilage, wastage, etc., road system, and the value of reduction of crop losses incurred by not reaping due to impassable roads during heavy rains; and
- the value of the reduction in vehicle operating costs in the movement of commodities to and from a specific road area, i.e., user savings.

g. Incremental costs include among others:

- the road constructions costs for a specific road and adequate anual maintenance;
- administrative costs associated with construction and maintenance;
- agricultural infrastructure costs such as augmented extension agent staffs and new storage facilities (none is anticipated under this Project); and
- agricultural input costs for new lands and for increasing productivity on old and new land; with input costs defined to include, in addition to the cost of the actual inputs, the cost of production and intermediate credit used to obtain the inputs and the cost of new land brought into cultivation. (These costs are contained in the with and without project farm budget analysis.)

h. Shadow prices are used for such items as unskilled labor, capital equipment and agricultural products.

## 2. Specific Methodology for Evaluating Individual Rural Road Segments During Project Implementation Period

Individual road segments proposed for project financing will be analyzed in terms of their probable farm income impact. Anticipated costs and benefits will be discounted at 12%. Only those roads achieving a B/C ratio of 1 or greater will make the final eligibility list as discussed in Stage 6 of the selection process. The B/C ratio will then be one of four factors used to determine the ultimate priority list. By accepting only roads with a benefit/cost ratio of 1.0 or better an internal rate of return to the project of at least 12% will be insured.

### a. Benefits

The only benefits quantified for the feasibility analysis will be the increases in agricultural production, including increases in hectarage and productivity, and increases in farm gate prices.

The savings in transportation cost to the farmer will be estimated by comparing costs on dirt and improved roads in the area. This savings will be reflected in the transportation costs for the production sold in the pre-and without-road farm budgets. While, as noted in the text of the PP, the trucker will also share in the transportation cost savings, these benefits will not be included because their exclusion will not appreciably affect the absolute value of the B/C ratios, nor their relative values.

b. Development of Farm Budget of Typical Farm, With and Without the Project, i.e., With and Without Road Improvement

1. Without-Project Farm Budget

From information found in existing studies and from on-site surveys of the farm in the area of each road segment. Analysts will develop farm budgets that represent the existing situation for the average or typical farmer. If several distinct farming patterns or crop combinations or farm sizes eixts in an area, the appropriate number of "typical" farm budgets will be constructed.

Without any road improvement, it is assumed that there will be no change in farming practices or relative prices and that as a result the same farm budget(s) will apply year after year. Thus, for this analysis, the farm budget existing before the project is equivalent, in economic jargon, to the without-project farm budget, a concept used by economists to capture the changes in farm budgets that may occur over time even in the absence of improved roads.

2. With-Project Farm Budget

Once the without-project farm budget(s) is developed, the analysts will then estiamte the changes, discussed in the benefits section above, that are likely to occur as a result of the project, i.e., as a result of road improvement, and produce a with-project farm budget(s) for the typical farm(s) in the area of influence of each road segment.

Some or all of the following information sources will be used by the analysts to arrive at the estimatd changes found in the with-project farm budget(s):

a. On-site farm survey
b. Agricultural studies of area
c. Soil maps
d. Survey of nearby similar communities which have had an improved road for some time.

The change, or difference, in total farm revenue and total farm costs between the with and without road improvement farm budgets will be used in the economic analysis of each road segment.

With few exceptions, the rural trails and dirt tracks to be improved under the project will have littel land that is not already included within the boundaries of existing farms. For these cases, as noted above, the total change figures for the typical farm (obtained from the difference between the with and without-project farm budgets) are multiplied by the total number of farms within the area of influence of the road to obtain the total effect on all the farms. However, for those few road segments that do have extra land and are likely to attract new farmers, the analyst will multiply the figures from the with-project farm budget by the number of anticipated new farms to be attracted to the area. The opportunity cost for these new farmers will be considered to be zero. Thus, the with-project farm budget figures for these new farms will represent the total change in revenue and total change in cost to them and to the economy.

3. Typical Area Farm Budgets

To reduce the amount of field work needed to obtain the information to develop these budgets whereever possible, "area" farm budgets will be developed that can be used as proxies for an average farm along any road within a given area. If there are significant differences within an area, more than one typical farm budget will be developed for that area. Likewise, if there are significant differences in farm size along any given road, farm budgets by farm size will be developed. Given the similarity of land use potential, climate, and terrain, it may be possible to use an average "area" farm budget in the vast majority of cases.

Assuming that one average with-and without-farm budget can capture the change in total farm revenue (dTR) and total farm cost (dTC) (and hence the change in net revenue) the following equation represents the procedure for estimating the total change in farm income (DY) due to road improvement for a given road segment:

$$DY = \text{No. of Farms} \times dTR - \text{No. of Farms} \times dTC$$

It is assumed that the income change will begin one year after completion of road improvement (the second year of the B/C analysis) and will increase in a linear fashion until the maximum change is reached in the fifth year after road completion.

d. General Assumptions and Shadow Prices Used in Analysis

1. Shadow Pricing Agricultural Products and Inputs:

The agricultural products and their inputs will be priced at a value net of subsidies and taxes. World prices will be used to determine these net values.

2. Salvage Value of Road:

The salvage value of an improved road at the end of its assumed 10 year life is considered a benefit for the purposes of the Benefit/Cost analysis. This salvage value; including bridges and fords, is conservatively estimated at 55% of cost after 10 years. No attempt will be made to shadow price the resulting value.

3. Cost Assumptions

Projects costs are relatively straightforward in terms of equipment, labor, and operating costs for construction and maintenance, economic costs are equivalent to financial costs with exception of unskilled labor, and capital costs, which are shadow priced.

a. Shadow Pricing Unskilled Labor

Will be shadow priced at 50% of its financial value.

b. Construction Costs

The economic cost is obtained from the financial cost figure by shadow pricing the unskilled labor and capital components. Unskilled labor is shadow priced at 50% of its financial value, capital costs are adjusted upward by 1.3 to reflect the fact that the equipment was purchasedat at L 2 to US$1 rate when it should have been purchased at a rate closer to L 2.6 to US$ (the replacement value certainly should be at this higher price). The figure 1.3 is obtained by dividing L 2.6 by 2.0.

Capital equipment cost are estimated to be 60% of total construction cost, skilled labor 25%, and unskilled labor 15%. Thus, the economic cost of a 10 km. road, with a financial cost of L 300,000, would be calculated in the following manner:

| | | |
|---|---|---|
| Capital | L 300,000 x .6 x 1.3 | = L 234,000 |
| Skilled labor | | = L 75,000 |
| Unskilled labor | L 45,000 x .5 | = L 22,500 |
| | | L 331,500 |

It is the L 331,500 figure that will then be used in the B/C analysts.

c. Administrative Cost

Total administrative costs associated with the construction of an average of 1,000 kms is $7,500,000 or 50% of construction cost. The construction cost of a road segment is multiplied by the 1.50

factor in order to pro-rate administrative costs to each road segment. Administrative costs are not shadow priced.

d. Maintenance Cost

The economic cost of $553 per kilometer is obtained by shadow pricing the financial cost figure $500/km:

| | |
|---|---|
| Capital: L 500 x .6 x 1.3 | = L 390.00 |
| Skilled labor | = L 125.00 |
| Unskilled labor | = L 37.50 |
| | L 552.50 |

4. Other Assumptions

a. The shadow price of foreign exchange is assumed to be equal to L2.6 to US$1.

b. The opportunity cost of capital is assumed to be 12%.

c. For the purpose of economic appraisal, prices are held constant on the assumption that benefits and costs will be equally affected by inflation.

e. Benefit/Cost Analysis

1. A Simplified Rigourous Approach

There already exists a tentative list of roads amounting to a total of 1,900 kms. and it undoubtedly will grow once the populace learns of the program. This anticipated high number of rural road improvement requests combined with their low construction cost/low traffic count makes it impractical to conduct extensive surveys for each candidate road as is frequently done to analyze more expensive, paved road projects. The conventional type of analysis would not only be extremely costly, both absolutely and relatively, but time consuming as well. While such cost is not justified, it still is necessary to develop a method that adequately discriminates between proposed subprojects on the basis of net economic benefits. For this Project, the existing census and climatological data, and land use and topographic maps will provide the TASU with excellent data sources for developing average "area" without-and-with-road farm budgets that are reasonably accurate and cost-effective estimates of the income changes expected to occur as a result of road improvement.

2. Easily Used by Non-Competitive/Financial Personnel

To further reduce the cost of the feasibility analysis, a simplified Benefit/Cost procuedure, as described below, has been developed so that non-economic/financial peronnel can conduct the analysis with minimum supervision and training.

It is a "simplified" approach requiring that only a few numbers and calculations be supplied in order to obtain the benefit/cost ratio for each road. Compounded discount factors have already been calculated and the major algebraic manipulations completed. Values for the major variables that will be used during the first six months have already been calculated and are presented below. The economists in the TASU will periodically review and update these values and make needed changes in the basic equations used.

The simplification of the B/C analysis does not imply that its integrity has been reduced or impared as a tool for road selection. Rather, by simplification we mean a reduction of the conventional tabular B/C presentation (with rows representing each year of a project's life, with the costs and benefits appropriately disocunted, their yearly present values added, and the B/C rates determined) to a simple algebraic expression.

3. Easier To Teach Than the Typical Internal Rate of Return Analysis

Benefit/cost analysis has been chosen as the rate of return procedure for the project and for the implementation phase in lieu of internal rate of return (IRR) analysis. The simplified B/C approach used here has been tested and used by SECOPT personnel for the previous AID rural road projects, and in other countries has proved to be a conceptually and operationally easier approach to teach to non-economical/financial personnel, who are responsible for much of the data collection and calculations, than has the IRR approach.

4. Explanation of B/C Equation Used in The Economic Analysis

a. Generalized Presentation

The general equation is expressed in the following manner:

$$B/C = \frac{(\text{Farms})\ (\text{dTR})\ \text{ASDF}_1 + (\text{Salv})\ (\text{DF}_1)}{\text{Const}(\text{DF}_2) + \text{Maint}(\text{SDF}_1) + (\text{Farms})\ (\text{dTC})(\text{ASDF}_2)}$$

where:

Farms = the total number of farms affected by the road improvement

dTR, dTC maximum change in total revenue (cost) for average farm in the fifth year after road construction

$\text{ASDF}_1$ = adjusted sum of discount factors applied to dTR

Salv = salvage value

$DF_1$ = appropriate year discount factor to be applied to salvage value

Const = road construction cost

DF = Appropriate year discunt factor to be applied to construction costs

Maint = yearly maintenance cost

$SDF_1$ = sum of discount factors applied to maintenance cost

$ASDF_2$ = adjusted sum of discount factors applied to dTC

The above equation can be modified to include more than one typical farm. For example, the following equation accomodates three different typical farms:

$$B/C = \frac{\sum_{i=1} (ASDF_i)\ (F_i)\ (dTR_i) + (Salv)\ (DF)}{(Const)\ (DF) + (Maint)\ (SDF) + \sum_{i=1}^{3} (ASDF_i)\ (F_i)\ (dTC_i)}$$

b. Specific Application For This Project

For this project, we apply the following assumptions to the first equation in order to reduce the number of unknowns:

1. all values are economic values, that is, where appropriate, financial prices have been shadow priced.

2. 10 year project life

3. 12% discount factor

4. Road construction is assumed to be completed at the end of the year, hence, the discount factor is .893 rather than 1.0.

5. Administrative Cost is 50% of Construction Cost. Thus we multiply the Construction Cost by 1.5 in the equation. Administrative Cost could be included in the equation, but for sake of a cleaner presentation, it has been omitted.

6. Maintenance Cost is constant at L 552 /km., beginning the year after construction (conceptually year 2) and continuing for 10 years. The sum of discount factors at 12% for years 2-11 = 5.05.

7. Salvage Value is assumed to be 55% of Construction Cost and is discounted in the eleventh year with a value of .287.

8. Farm revenue and costs are assumed to change linearly from year 2 until they attain a maximum five years later in year 6. To be able to simplify the equation and use just the maximum attained figures represented by dTR and dTC, the discount factors need to be adjusted. That process is shown in Table 1 . For this project the value is 3.56.

The above assumptions produce the following equations.

Considering first just the various sum of discount factors, we get:

$$B/C = \frac{(Farms)(dTR)(3.56) + (Salv)(.287)}{(1.5)(Const)(.893) + (Maint/km)(kms)(5.05) + (Farms)(dTC)(3.56)}$$

Adding the information for Salvage Value and Maintenance, the equation is reduced to five unknowns:

$$B/C = \frac{(Farms)(dTR)(3.56) + (Const)(.55)(.287)}{(1.5)(Const)(.893) + (L\ 552)(kms)(5.05) + (Farms)(dTC)(3.56)}$$

Simplifying further:

$$B/C = \frac{(Farms)(dTR)(3.56) + (Const)(.16)}{(1.5)(Const)(.893) + (L\ 2788)(kms) + (Farms)(dTC)(3.56)}$$

We are left with five unknowns:

--the number of average farms within the area of influence of the road;
--the change in total revenue per average farm;
--the construction cost of the road segment;
--the length of the road in kilometers; and
--the change in total cost per average farm.

This is the data that the TASU must collect for each road segment analysed.

## Adjusting Discount Factors for dTR and dTC

| | (1) | | (2) | | (3) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Yearly Income | | | | | | | | |
| Year | dTR[a] | X | $dTR_1/dTR$ | X | Discount Factor 12% | = | dTR | X | Adjusted Discount Factor (2) x (3) |
| 1 | | | | | | | | | |
| 2 | dTR | | 1/5 | | .797 | = | dTR | | .16 |
| 3 | dTR | | 2/5 | | .612 | = | dTR | | .24 |
| 4 | dTR | | 3/5 | | .636 | = | dTR | | .38 |
| 5 | dTR | | 4/5 | | .567 | = | dTR | | .45 |
| 6 | dTR | | 5/5 | | .506 | = | dTR | | .51 |
| 7-11[b] | dTR | | 5/5 | | 1.82 | = | dTR | | 1.82 |
| | | | | | | | dTR | | (3.56) |

Rounding: dTR (3.56) = Present value of change in total revenue from year two through year fifteen.

dTC (3.56)[c] = Present value of change in total cost from year two through year fifteen.

---

a dTR equals maximum change in total revenue assumed to occur in year five after road construction, or year six of the project life.

b Since dTR is not adjusted for years seven through eleven, the discount factors can be summed.

c Our linear assumptions lead to the equivalency between the two ASFS.

ANNEX K

RURAL ROADS II
PROCUREMENT PLAN

| Commodity/Service | Description | Estimated Cost US$ 000 | Source | Type of Procurement | Delivery Date | Lead Time | Waiver Purchase Agent | Approval Required | Publicize CBD |
|---|---|---|---|---|---|---|---|---|---|
| 01 Management and Planning | | | | | | | | | |
| 1. Micro computer (4) | IBM PCxt | 40 | 000 | Competitive | 10/85 | 6 mos. | USAID/H | Proprietary Procurement | |
| 2. Equipment (4) | Engineering Office | 40 | 000/935 | Competitive | 10/85 | 6 mos. | USAID/H | None | X |
| 3. TA | Computer Training | 2 | 000/935 | Non-competitive | 10/85 | 2 mos. | USAID/H | Non-Competitive Justification | |
| | Management and Supervision Training | 50 | 000/935 | Formal Sol. | 10/85 | 6 mos. | USAID/H | None | X |
| 4. Office Bldgs. (4) | Construction of Engineering Offices | 200 | 000/935 | Competitive | 5/86 | 12 mos. | USAID/H | None | X (Local) |
| 02 Construction | | | | | | | | | |
| 1. Vehicles (8) | Pickup trucks | 120 | 000 | Competitive | 1/86 | 8 mos. | USAID/H | Proprietary Procurement | |
| 2. TA | 3 Res. Engrs. 1 Economist | 815 | 000/935 | Competitive | 6/85 | 2 mos. | USAID/H | None | |
| | Technical Training | 50 | 000/935 | Formal Sol. | 10/85 | 6 mos. | USAID/H | None | X |
| 3. Evaluation | Impact | 150 | 935 | Competitive | 12/86 | 18 mos. | USAID/H | None | X (Local) |
| 03 Maintenance | | | | | | | | | |
| 1. Vehicles (3) | Pickup trucks | 45 | 000 | Competitive | 1/86 | 8 mos. | USAID/H | Proprietary Procurement | |
| 2. Tools | Hand tools for road maintenance | 68 | 000/935 | Competitive | 1/86 | 8 mos. | USAID/H | None | X |
| 3. Equipment | 3-wheeled bycicle (40) | 20 | | | | | | | |
| | mini-trailer (80) | 12 | 935 | Competitive | 2/86 | 9 mos. | USAID/H | Proprietary Procurement | |
| 4. TA | Technical Training | 50 | 000/935 | Formal Sol. | 10/85 | 6 mos. | USAID/H | None | X |

ANNEX L

## DEFINITIONS

Following are definitions of terms that have been used in this paper:

1. Primary or Arterial Road. Characterized by one or more of the following criteria:

   i. Provides key access to a large land area and/or links up major population centers.

   ii. May be paved or unpaved.

   iii. Provides for maximum mobility and travel efficiency for multi-purpose activities (basically handles through traffic or moves traffic between major cities).

   iv. Usually provides constant service.

2. Secondary or Collector Road. Characterized by one or more of the following:

   i) Accesses smaller areas and links up secondary or smaller population centers or towns.

   ii) Connects to primary roads.

   iii) Collects traffic from tertiary roads.

3. Tertiary or Rural Access Road. All roads which are not primary or secondary roads characterized by one or more of the following:

   i) Provide access from isolated rural areas to the primary or secondary road network, and normally do not provide link betwen two primary or secondary roads.;

   ii) Unpaved, one lane road constructed to minimal geometric design standards.

   iii) May be subject in seasonal access due to weather, or access only by four wheel drive or other special vehicle.

4. Reconstruction/Rehabilitation/Betterment for the purposes of this project are synonymous terms and are defined as corrective measures or minor construction, and will include such activities as: construction or reconstruction of ditches; construction of transverse drains; minor realignment to minimize grades; construction of new bridges or new decking on existing bridges; construction of new culverts or cleaning and repair of existing culverts; minimum cuts and fills; escarification, grading, ballast and compaction of road surface. These construction activities are based on plans and specifications in accordance with the design and construction manual approved by A.I.D.

5. Road Maintenance Management Plan (RMMP)

A Road Maintenance Management Plan will be a condition precedent to Initial Disbursement for construction.

The purpose of the Maintenance Management Plan is to improve the decision making processes in managing and implementing the maintenance of rural roads.

As a minimum the RMMP will describe how area maintenance plans will be implemented for both preventive (routine) and deferred (annual) maintenance.

The RMMP will include a description and purpose of maintenance level, maintenance activity standards that are to be used in the implementation of the area maintenance plan.

6. Road Area Maintenance Plan (RAMP)

The purpose of the Area Maintenance Plan is to plan, budget and schedule for implementation the required maintenance level, activities and standards for preventive (routine) maintenance and deferred (annual) maintenance on Project roads, road links or segments on an area by area basis.

The RAMP will be developed in accordance with the Road Maintenance Management Plan prior to sub-project implementation and updated annually as conditions warrant.

7. Preventive/ Routine Maintenance

Routine maintenance is the ordinary maintenance activities such as ditch and culvert cleaning, filling and hand tamping of potholes, brushing out or small slide removal that can be readily accomplished by hand labor using such tools as pick, shovel, machete, wheelbarrow. Transportation may or may not be required.

8. Deferred (annual) Maintenance

Deferred maintenance are activities that may be scheduled at a later date such as grading, surfacing replacement, compaction that normally require the use of mechanized equipment. This is normally accomplished twice per year once (prior to the rainy season).

9. Maintenance Level

Maintenance Level will define the level of maintenance required that considers average daily traffic (ADT) and other varying conditions that will provide for the proper level-of-service on a road, road link, or road segment.

10. Maintenance Activity Standards

Maintenance activity standards will define what the activity is (description and purpose), how it is measured (e.g. mts, km, man-hours), how it is applied (e.g. scheduling, crew size, equipment), and how much it costs.

Following is a general list of maintenance activities to be included for definition and use in the RMMP and RAMP.

1) General Activities (e.g. road logs, condition surveys)

2) Traveled Way Activities (e.g. compaction blading, etc.)

3) Drainage Activities (e.g. ditch cleared, catch basins, etc.)

4) Roadway Activities (e.g. vegetative cover, brushing out, etc.)

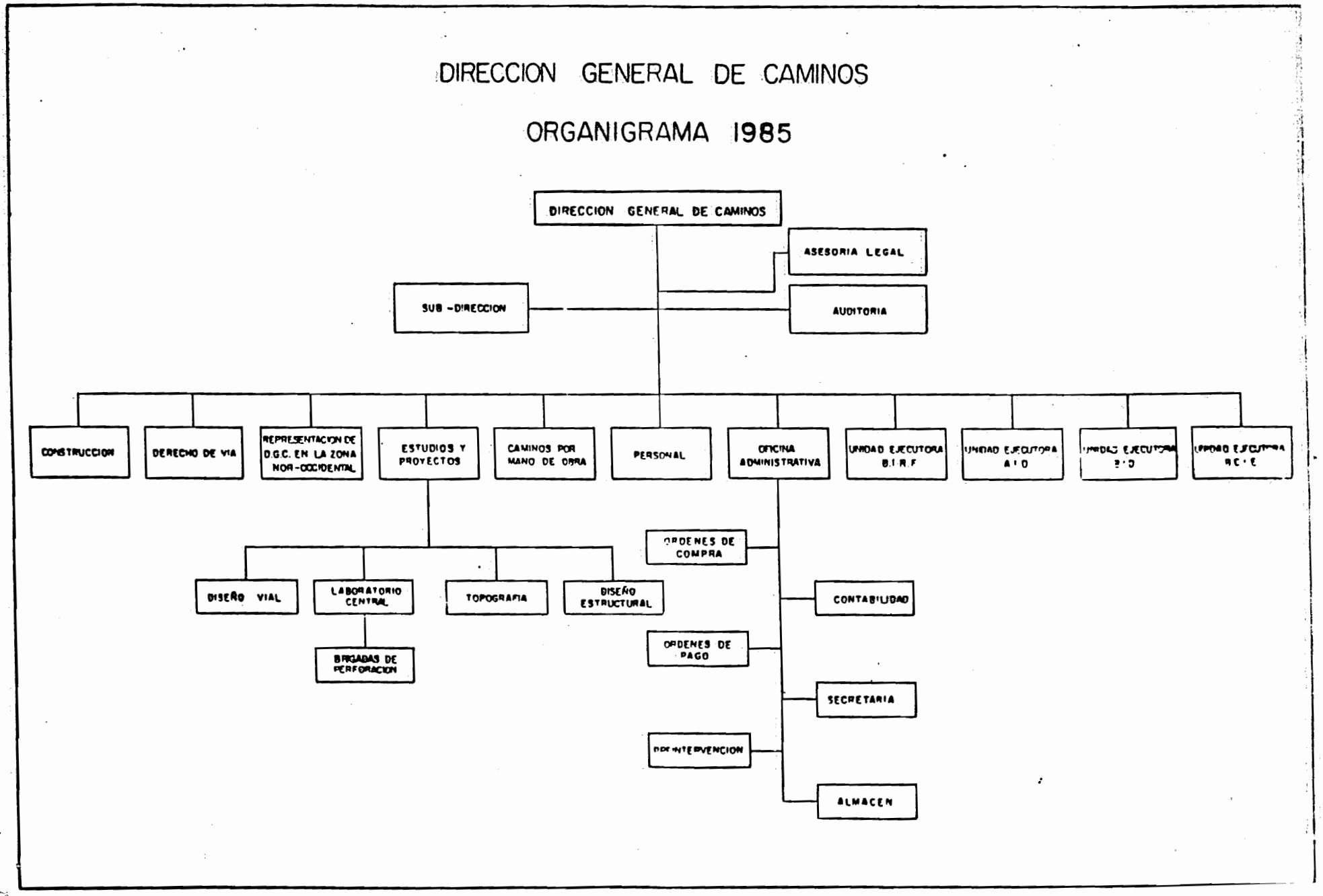
5) Structure Activities (e.g. bridges, guardrails, etc.)

6) Traffic Services Activities (signing, route markers, physical closure devices).

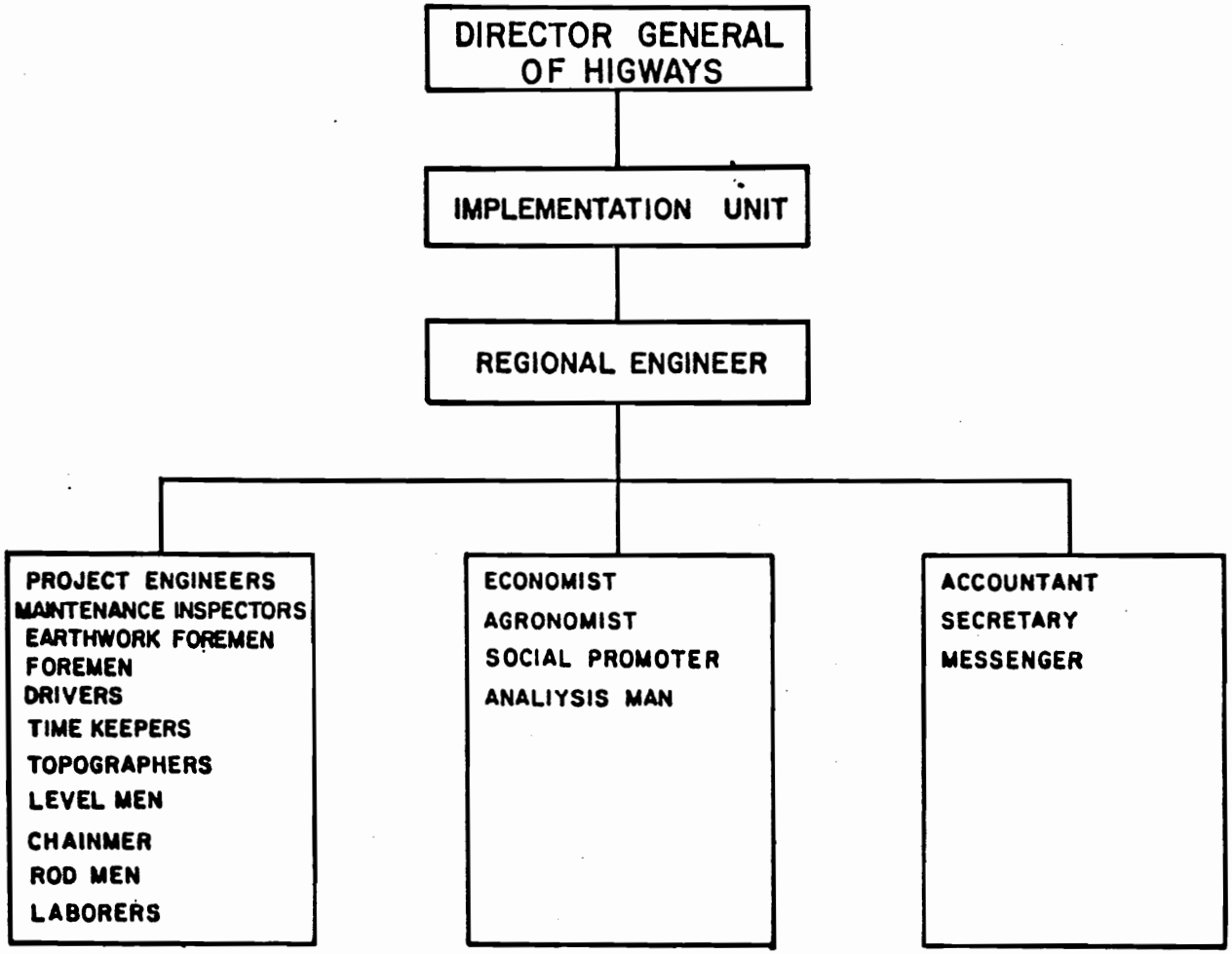
The engineering studies, preliminary information and reports, and other data indicate that this is a feasible and sound project. The estimated cost of equipment and materials have been developed based upon the most reliable data available taking into consideration probable escalation costs. These estimates are considered reasonably firm. All materials and equipment are available and the acquisition of these items present no special problems. It is the judgement of the Project Commitee that the requirements of Section 611 (a) (1) of the Foreign Assistance Act of 1961, as amended, have been met.

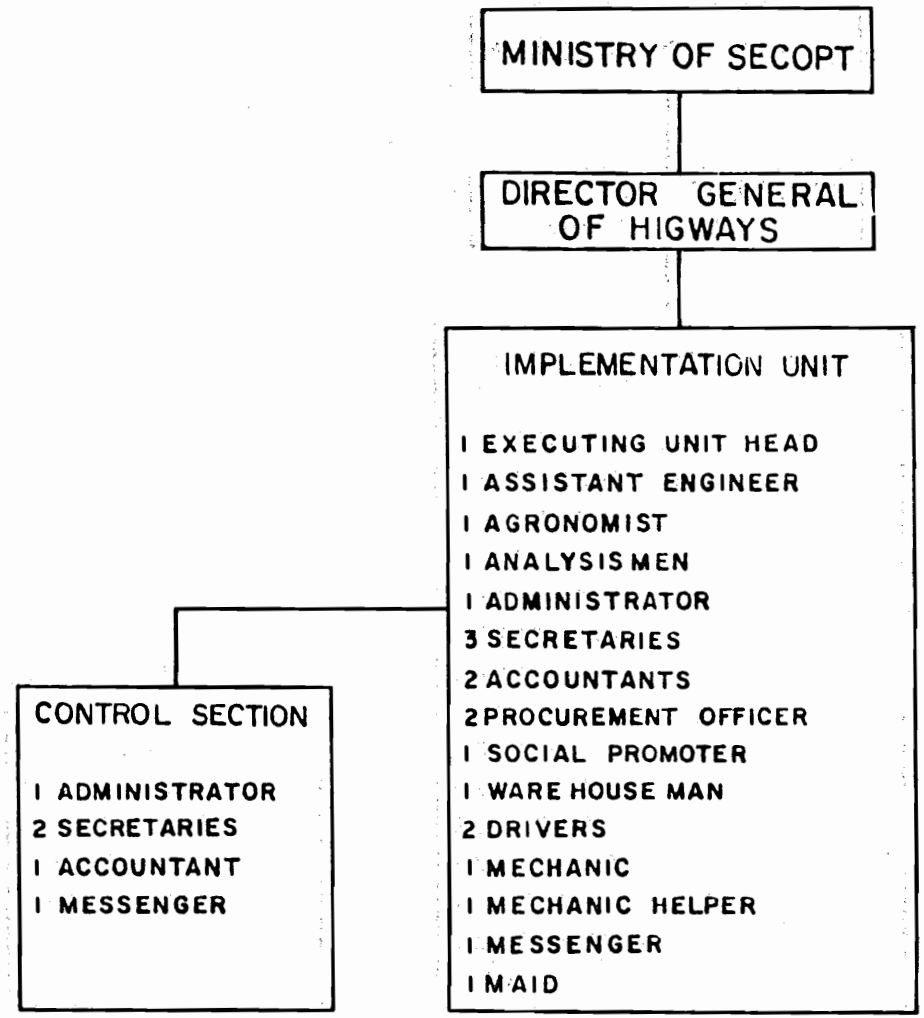
ORGANIZATION OF SECOPT

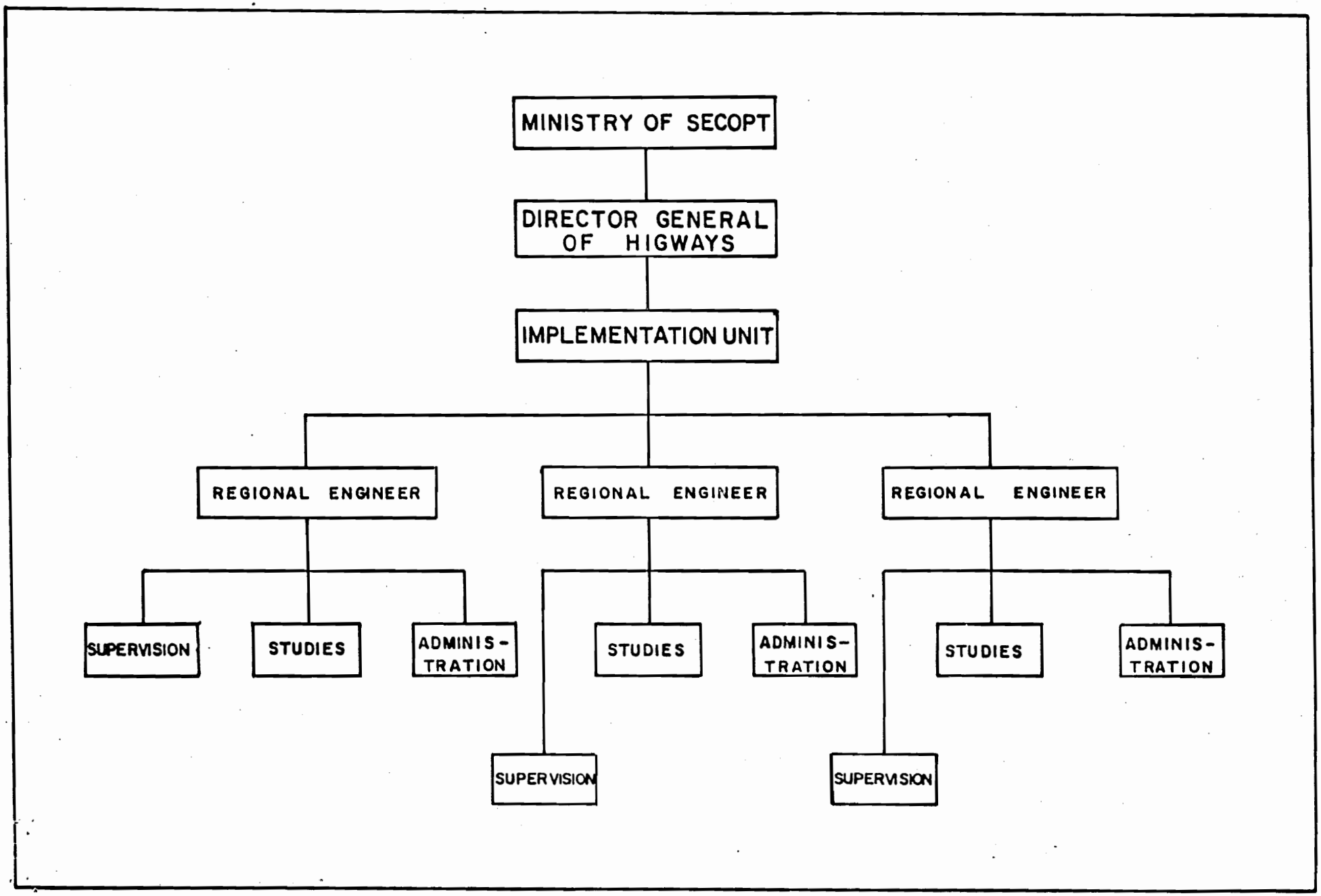
ANNEX M



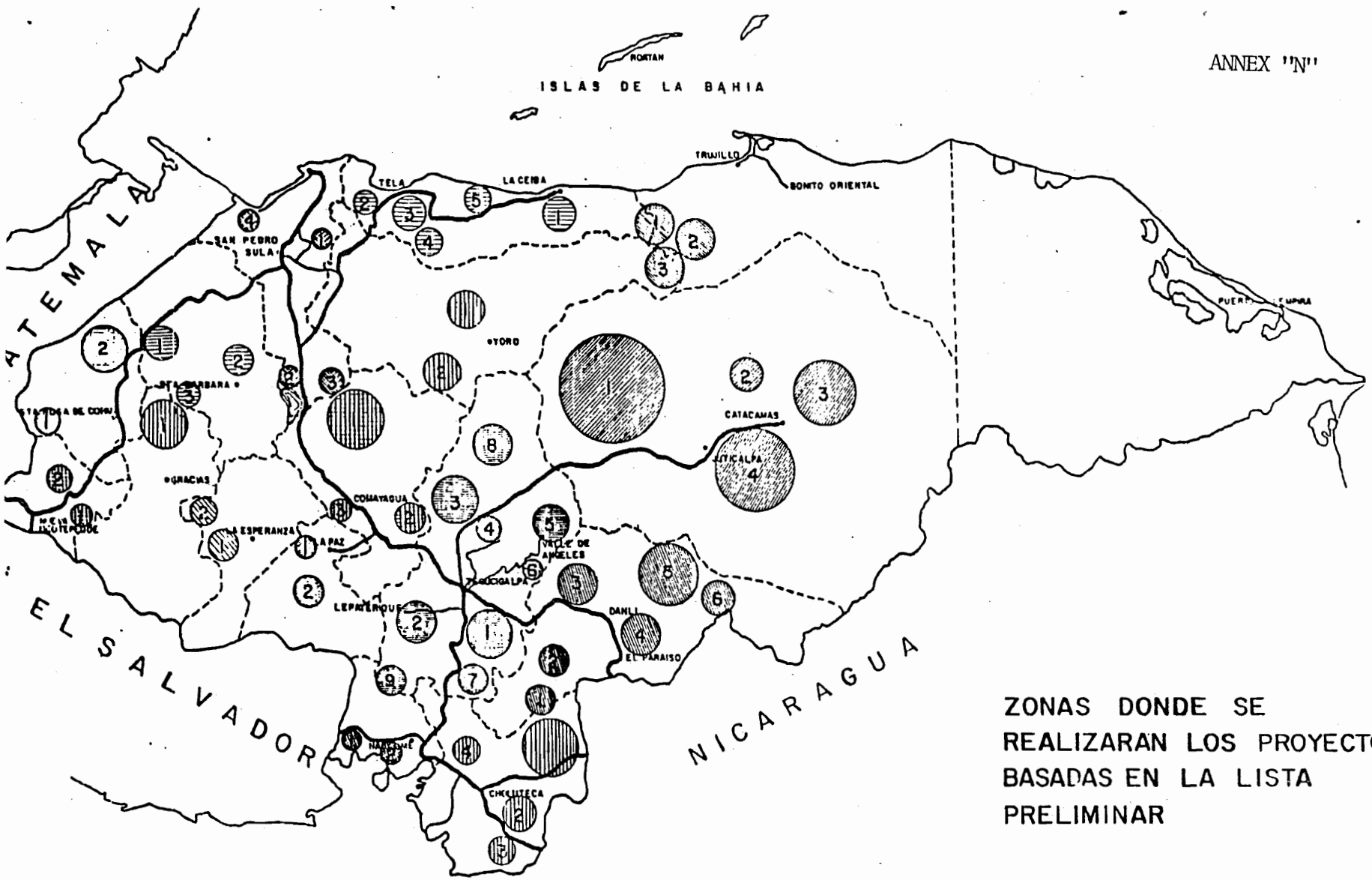

BEST AVAILABLE COPY


DIRECTOR GENERAL OF HIGWAYS
IMPLEMENTATION UNIT
REGIONAL ENGINEER
PROJECT ENGINEERS
MAINTENANCE INSPECTORS
EARTHWORK FOREMEN
FOREMEN
DRIVERS
TIME KEEPERS
TOPOGRAPHERS
LEVEL MEN
CHAINMER
ROD MEN
LABORERS
ECONOMIST
AGRONOMIST
SOCIAL PROMOTER
ANALIYSIS MAN
ACCOUNTANT
SECRETARY
MESSENGER


MINISTRY OF SECOPT
DIRECTOR GENERAL OF HIGWAYS
IMPLEMENTATION UNIT
1 EXECUTING UNIT HEAD
1 ASSISTANT ENGINEER
1 AGRONOMIST
1 ANALYSIS MEN
1 ADMINISTRATOR
3 SECRETARIES
2 ACCOUNTANTS
2 PROCUREMENT OFFICER
1 SOCIAL PROMOTER
1 WARE HOUSE MAN
2 DRIVERS
1 MECHANIC
1 MECHANIC HELPER
1 MESSENGER
1 MAID
CONTROL SECTION
1 ADMINISTRATOR
2 SECRETARIES
1 ACCOUNTANT
1 MESSENGER


MINISTRY OF SECOPT
DIRECTOR GENERAL OF HIGWAYS
IMPLEMENTATION UNIT
REGIONAL ENGINEER
REGIONAL ENGINEER
REGIONAL ENGINEER
SUPERVISION
STUDIES
ADMINIS-TRATION
STUDIES
ADMINIS-TRATION
STUDIES
ADMINIS-TRATION
SUPERVISION
SUPERVISION

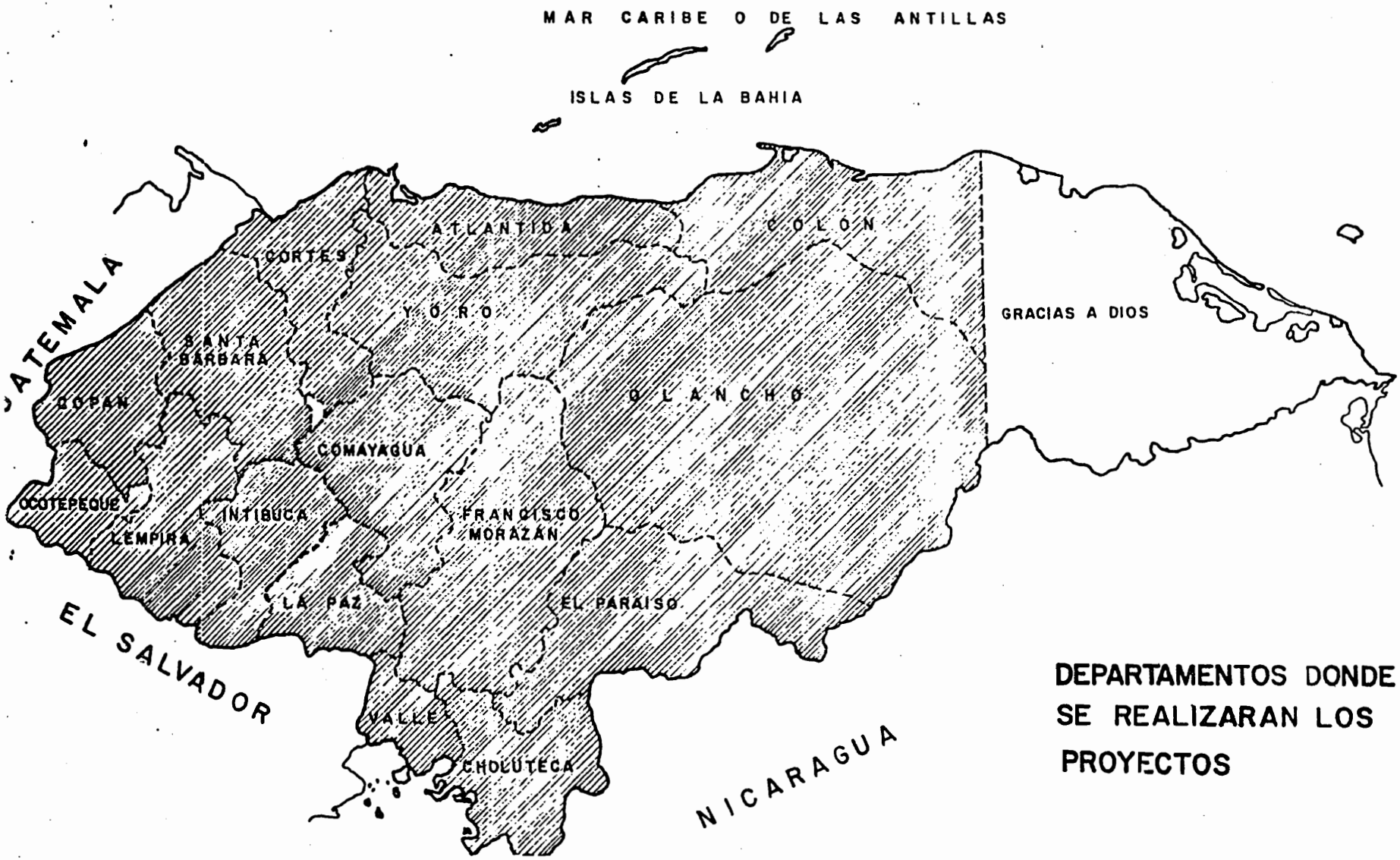
ANNEX "N"




ZONAS DONDE SE REALIZARAN LOS PROYECTOS BASADAS EN LA LISTA PRELIMINAR

BEST AVAILABLE COPY

129




DEPARTAMENTOS DONDE SE REALIZARAN LOS PROYECTOS

BEST AVAILABLE COPY

## ESTIMATED COST FOR RURAL TRAIL PROJECT - 1 KM

| DESCRIPTION | EQUIPMENT | MATERIALS | LABOR | TOTAL LPS |
|---|---|---|---|---|
| D-6 140 H.P.<br>27 hrs. at L 90.00/hr | 2,298.00 | | 132.00 | 2,430.00 |
| Dump Trucks<br>8 hrs. at L 28.00/hr | 212.00 | | 12.00 | 224.00 |
| Air Compressor w/Jack Hammer<br>8 hrs. at L 70.00/hr | 536.00 | | 24.00 | 560.00 |
| Vibratory Compactor<br>8 hrs. at L 90.00/hr | 708.00 | | 12.00 | 720.00 |
| Water Truck<br>8 hrs. at L 45.00/hr | 348.00 | | 12.00 | 360.00 |
| Motorgrader 135 HP<br>15 hrs. at L 70.00/hr | 1,020.00 | | 30.00 | 1,050.00 |
| Loader 920 - 1.3 cubic yds.<br>8 hrs. at L 60.00/hr | 464.00 | | 16.00 | 480.00 |
| Culverts:<br>15 lin. meters, 24"<br>at L 190.00/m | 194.00 | 2,067.00 | 589.00 | 2,850.00 |
| 5 lin. meters, 30"<br>at L 275.00/m | 112.00 | 1,035.00 | 228.00 | 1,375.00 |
| Headwalls and Drop inlets<br>stone 18.80 $mts^3$/Km | 819.00 | 1,850.00 | 815.00 | 3,484.00 |
| Concrete Submerged Ford | 189.00 | 205.00 | 48.00 | 442.00 |
| Fencing | 368.00 | 710.00 | 379.00 | 1,457.00 |
| Clearing Grubbing | 91.00 | 45.00 | 364.00 | 500.00 |
| Select Material 600 $mts^3$<br>at L 15.00/$mts^3$ | 7,650.00 | | 1,350.00 | 9,000.00 |
| TOTALS | 15,009.00 | 5,912.00 | 4,011.00 | 24,932.00 |
| US$ Equivalent | (7,504.50) | (2,956.00) | (2,005.50) | (12,466.00) |

US$ 1.00 = L 2.00

## ESTIMATED COST FOR ACCESS ROAD PROJECT - 1 KM

| DESCRIPTION | EQUIPMENT | MATERIALS | LABOR | TOTAL LPS |
|---|---|---|---|---|
| D-6 140 H.P.<br>40 hrs. at L 90.00/hr | 3,411.00 | | 189.00 | 3,600.00 |
| Dump Trucks<br>12 hrs. at L 28.00/hr | 318.00 | | 18.00 | 336.00 |
| Air Compressor w/Jack Hammer<br>10 hrs. at L 70.00/hr | 658.00 | | 42.00 | 700.00 |
| Vibratory Compactor<br>12 hrs. at L 90.00/hr | 1,060.00 | | 20.00 | 1,080.00 |
| Water Truck<br>12 hrs. at L 45.00/hr | 521.00 | | 19.00 | 540.00 |
| Motorgrader 125 HP<br>20 hrs. at L 70.00/hr | 1,200.00 | | 200.00 | 1,400.00 |
| Loader 920 - 1.3 cubic yds.<br>12 hrs at L 60.00/hr | 695.00 | | 25.00 | 720.00 |
| 14 lin. meters, 24"<br>at L 190.00/l.m. | 181.00 | 1,529.00 | 950.00 | 2,660.00 |
| 7 lin. meters, 36"<br>at L 390.00/m | 211.00 | 2,001.00 | 518.00 | 2,730.00 |
| Headwalls, stone<br>Drop inlets, stone | 932.00 | 1,389.00 | 1,263.00 | 3,584.00 |
| Concrete Submerged Ford | 197.00 | 215.00 | 51.00 | 463.00 |
| Fencing | 387.00 | 1,444.00 | 681.00 | 2,512.00 |
| Clearing Grubbing | 91.00 | 45.00 | 364.00 | 500.00 |
| Select Borrow - 825 $mts^3$<br>at L 15.00/$mts^3$ | 10,364.00 | | 2,011.00 | 12,375.00 |
| TOTALS | 20,226.00 | 6,623.00 | 6,351.00 | 33,200.00 |
| US$ Equivalent | (10,113.00) | (3,311.50) | (3,175.50) | (16,600.00) |

US$ 1.00 = L 2.00

# LOCAL CONSTRUCTION FIRMS

| | Descripción | Activo Circulante |
|---|---|---|
| 1. | Constructora Aguilar | Lps 13,004,982.0 |
| 2. | Saopin de Honduras | 8,308,995.0 |
| 3. | Constructores Técnicos | 6,014,439.0 |
| 4. | Nello L. Teer | 5,077,421.0 |
| 5. | Pavimentos de Honduras | 4,178,175.0 |
| 6. | Constructora ETERNA | 3,055,287.0 |
| 7. | EDINSA - Nacional de Ingenieros | 2,403,429.0 |
| 8. | ICCASA | 2,297,912.0 |
| 9. | Constructora Ayon Cordova | 1,799,573.0 |
| 10. | Constructora Salinas Cardona - Lempira | 1,848,015.0 |
| 11. | Constructora Salvador García y Asocs. | 1,389,000.0 |
| 12. | Constructora Regina | 1,226,997.0 |
| 13. | Constructora FALCON | 743,947.0 |
| 14. | Constructora PRODECON | 714,155.0 |
| 15. | Construcciones de Honduras | 576,108.0 |
| 16. | Constructora PAREDES | 503,770.0 |
| 17. | Constructora ECO | 495,983.0 |
| 18. | Constructora TICAMAYA | 486,105.0 |
| 19. | Constructora DICSU | 466,000.0 |
| 20. | Constructora YUM-KAX | 367,183.0 |
| 21. | Constructora La Victoria | 356,000.0 |
| 22. | Constructora ETECOS | 241,489.0 |
| 23. | Constructora ETIN | 274,546.0 |
| 24. | Constructora HIRISI | 170,075.0 |
| 25. | Constructora Rodríguez - ChiHam | 160,223.0 |
| 26. | Constructora FAMAICA | 146,353.0 |
| 27. | Constructora CONGOLON | 130,000.0 |
| 28. | Constructora UNITECNIA | 101,502.0 |

SAMPLE CONVENIO

ANNEX Q

## DIRECCION GENERAL DE MANTENIMIENTO

### CONVENIO
### PARA EL MANTENIMIENTO DE UN CAMINO RURAL

Conforme al programa de la Dirección General de Caminos por medio de la Unidad Ejecutora Préstamos de la A.I.D., y con el fin de construir un camino rural entre - - - - - - - - - - - - - - - - - - para dar acceso vial a las aldeas de - - - - - - - - - - - - - - - - - en el Municipio de - - - - - - - - - - - - - - - - del Departamento de - - - - - - - - - - - - - - -, se efectúa este convenio entre - - - - - - - - - - - - - - - - - y la Dirección General de Mantenimiento.

Plan de Acciones y Responsabilidades de las partes de este Convenio

A. Son responsabilidades de la Dirección General de Mantenimiento de Caminos:

- Ejecutar el Plan de Mantenimiento
- Proporcionar la Asistencia Técnica del Mantenimiento del Camino, inspeccionándolo o impartiendo instrucciones al personal que ejecuta los trabajos.
- Asignar el personal requerido para ejecutar los trabajos.
- Suministrar las herramientas necesarias para el mantenimiento del camino construído.
- Suministrar los materiales de mantenimiento y gastos de operación de los vehículos.

B. La comunidad, representada por - - - - - - - - - - - - - - - acuerda de contribuir con:

- El personal suficiente para la ejecución de la obra, según el Plan de Mantenimiento contenido en el Convenio.
- Proporcionar el derecho de vía de acuerdo a las indicaciones del ingeniero responsable de la obra.

DIRECTOR GENERAL DE MANTENIMIENTO

ALCALDE MUNICIPAL O SU REPRESENTANTE

PRESIDENTE PATRONATO

# TENTATIVE LIST OF ROADS

## DEPARTAMENTO DE ATLANTIDA

| ZONA 1 | LONGITUD (KMS.) |
|---|---|
| 1.- La Ceiba-Las Mangas-Río Viejo-Yaruca-Las Flores-San José .. | 91.0 |
| TOTAL ..... | 91.0 |

| ZONA 2 | |
|---|---|
| 1.- Las Delicias-El Naranjo-Mezapa-Toloa Adentro-Aldea de Villa franca-La Unión-La Fortuna ..... | 35.0 |
| 2.- Arena Blanca-La Fortuna ..... | 45.0 |
| 3.- Morejen-La Fortuna ..... | 1.5 |
| 4.- Carretera Tela-La Ceiba-Mezapita, Acceso a Suyapa de Lean.. | 10.0 |
| TOTAL ..... | 91.5 |

| ZONA 3 | |
|---|---|
| 1.- La Esperanza de Santiago-Aldea del Norte Sion ..... | 10.0 |
| 2.- Acceso al Jute ..... | 1.5 |
| TOTAL ..... | 11.5 |

| ZONA 4 | |
|---|---|
| 1.- Nueva Florida-Texiguat-El Retiro-Jilamo (Puente Río Lean).. | 25.0 |
| 2.- Las Delicias-Nueva Florida ..... | 39.0 |
| TOTAL ..... | 64.0 |

| ZONA 5 | |
|---|---|
| 1.- Siempre Viva-Mata de Guineo-Flores de Italia-Los Cerritos-San José-Esparta ..... | 23.1 |
| TOTAL ..... | 23.1 |

LONGITUD TOTAL DEPARTAMENTO DE ATLANTIDA ..... 281.1

## DEPARTAMENTO DE COLON

| ZONA 1 | |
|---|---|
| 1.- Jutiapa-El Dulce-Tomalá-Ilamapa-Descombros-Puente Alto-Planes. | 45.0 |
| | 45.0 |

DEPARTAMENTO DE COPAN

| ZONA 1 | LONGITUD (KMS.) |
|---|---|
| 1.- Santa Rita-La Libertad ..... | 25.0 |
| 2.- Cabañas-Río Negro ..... | 40.0 |
| TOTAL .... | 65.0 |

| ZONA 2 | |
|---|---|
| 1.- Ocotán-Peña Blanca-San Joaquín ..... | 10.0 |
| 2.- Florida-Las Cañas-Rastrojitos-La Elencia-El Ermitaño-El Calichón ..... | 25.0 |
| TOTAL .... | 35.0 |

| | |
|---|---|
| LONGITUD TOTAL DEPARTAMENTO DE COPAN ..... | 100.0 |

DEPARTAMENTO DE CORTES

| ZONA 1 | |
|---|---|
| 1.- Hacienda La Cabaña-Jucutuma-Las Sabanas-San José del Boquerón-Flor del Valle ..... | 13.0 |
| 2.- Arenales-Choloma ..... | 33.7 |
| TOTAL .... | 46.7 |

| ZONA 2 | |
|---|---|
| 1.- San Antonio de Cortés-La Chanchona-Santa Rita-Nueva Granada-El Chiquibuite-Los Santa-Cinco Cerritos-SanRafael-Empalme-Carretera a Santa Bárbara ..... | 29.4 |
| 2.- San Luis-Guayabas Agrias-Vallecito, El Aguacate-Las Colmenas-Vallecito-Pedernales-El Picacho-La Ceibita..... | 25.0 |
| 3.- Villanueva-San José-El Guábano-Los Altos-Empalme carretera a San Isidro ..... | 14.5 |
| 4.- Desvío a Chasnigua-Chasnigua ..... | 4.0 |
| TOTAL .... | 72.9 |

| ZONA 3 | |
|---|---|
| 1.- Desvío a San Isidro (carretera a Sta. Cruz de Yojoa)-San Isidro-Victoria-Conchía-La Montañuela-El Paraíso-El Buen Pastor . | 24.0 |
| 2.- Victoria-Casas Viejas-La Laguna-El Jícaro, Desvío El Jícaro-Los Mangos-La Ceiba ..... | 22.0 |
| TOTAL .... | 46.0 |

| ZONA 2 | LONGITUD (KMS.) |
|---|---|
| 1.- Sabá-El Jaguillo Muerto-Orica-Palos de Agua Arriba-Rancho Quemado | 15.0 |
| 2.- El Achiote-Palos de Agua Abajo-Paguales | 7.0 |
| 3.- Lérida-Cuaca Viejo-Cuaca Nuevo-El Cayo Sierra-La Concepción-Ceibita-Tocoa | 24.0 |
| 4.- Planes-Monte de Oro-Lucía-Terrero de Flores-Los Cocos-Uyuca-El Juncal | 29.0 |
| TOTAL | 75.0 |

| ZONA 3 | |
|---|---|
| 1.- Macora-Plan Grande-San Francisco-Maloa-Armenia-Balsamo Oriental-Tepusteca-Agua Caliente-Las Golondrinas-Sabá | 51.0 |
| TOTAL | 51.0 |

| | |
|---|---|
| LONGITUD TOTAL DEPARTAMENTOS DE COLON-ATLANTIDA-YORO | 171.0 |

DEPARTAMENTO DE COMAYAGUA

| ZONA 1 | |
|---|---|
| 1.- Los Jobos, carretera a La Libertad-Aldea Guacamayas-Vega del Río Humuya, enlace carretera vieja a La Trinidad | 9.0 |
| 2.- Meambar-El Palmital-Concepción de Belen | 28.0 |
| 3.- Siguatepeque-Río Bonito | 25.0 |
| 4.- Acceso a La Cienaga | 5.0 |
| TOTAL | 67.0 |

| ZONA 2 | |
|---|---|
| 1.- Los Cimientos-El Horno-Agua Zarca-Planes-Río Blanco | 50.0 |
| TOTAL | 50.0 |

| ZONA 3 | |
|---|---|
| 1.- San Antonio de Cañas-Tontoral-Barrio Nuevo-Veracruz | 12.0 |
| 2.- Lejamaní-El Trapiche-El Pacón-Los Chircales | 10.0 |
| 3.- Acceso a La Cienaga | 6.0 |
| 4.- El Octavo (Escuela Fco. Morazán)-Carretera Nueva a La Paz | 3.0 |
| TOTAL | 31.0 |

| | |
|---|---|
| LONGITUD TOTAL EN EL DEPARTAMENTO DE COMAYAGUA | 150.0 |

| ZONA 4 | LONGITUD (KMS.) |
|---|---|
| 1.- Buena Vista-Barra del Motagua-Carretera pavimentada-El Triunfo ..... | 5.5 |
| TOTAL ..... | 5.5 |
| LONGITUD TOTAL DEPARTAMENTO DE CORTES ..... | 171.1 |

DEPARTAMENTO DE CHOLUTECA

| ZONA 1 | |
|---|---|
| 1.- Morolica-San Marcos de Colón ..... | 24.0 |
| 2.- Apacilagua-Morolica ..... | 26.0 |
| 3.- Apacilagua-La Garza-Los Dos Caminos-Travesía-El Jobal ..... | 15.0 |
| 4.- San Marcos de Colón-El Rodeo-San Juán de Duyusupo-Cacamuyá.. | 20.0 |
| 5.- San Francisco-Las Trementinas ..... | 15.0 |
| 6.- El Banquito-Carretera Panamericana-Desvío a Caña Vieja..... | 10.0 |
| TOTAL ..... | 110.0 |

| ZONA 2 | |
|---|---|
| 1.- El Triunfo-Nance Dulce-San Benito-Concepción de María-El Corpus ..... | 35.0 |
| 2.- El Corpus-La Laguna-Tuscagua, Accesos al Quebrachito, El Pueblito y Los Cocos ..... | 19.0 |
| TOTAL ..... | 54.0 |

| ZONA 3 | |
|---|---|
| 1.- El Cordón (carretera panamericana)-Los Cerritos-El Estribo.. | 15.0 |
| 2.- Tres Piedras (carretera panamericana)-El Carao-Los Cerritos. | 15.0 |
| TOTAL ..... | 30.0 |

| ZONA 4 | |
|---|---|
| 1.- San Martín-Los Hatillos de la Castaña-Cerro El Trapiche-El Rincón de la Castaña-El Pochote-Chapulín ..... | 26.0 |
| TOTAL ..... | 26.0 |
| LONGITUD TOTAL DEPARTAMENTO DE CHOLUTECA | 220.0 |

DEPARTAMENTO DE EL PARAISO

| ZONA 1 | LONGITUD (KMS.) |
|---|---|
| 1.- San Antonio de Flores-Portillo del Arado Grande | 24.0 |
| 2.- San Antonio de Flores-Duyure | 11.0 |
| TOTAL | 35.0 |

| ZONA 2 | |
|---|---|
| 1.- Alauca-Las Pintadas-Orealí | 21.0 |
| TOTAL | 21.0 |

| ZONA 3 | |
|---|---|
| 1.- Las Crucitas-Teupasenti | 30.0 |
| 2.- Carretera pavimentada a Danlí-La Chorrera-El Barro, Aeceso a Loma Limpia | 17.0 |
| TOTAL | 47.0 |

| ZONA 4 | |
|---|---|
| 1.- Chichimora-El Porvenir-El Orebradón | 15.0 |
| 2.- Carretera a El Paraíso-Santa Ana-Jutiapa-Accesos al Gualiqueme y El Hatillo | 36.0 |
| 3.- Acceso a Los Corrales-Las Mangas-El Cedral-Las Selvas | 33.0 |
| 4.- El Matasano-Zaragoza-Las Camelias | 10.0 |
| 5.- Acceso a Cebadilla-El Triunfo-Bañaderos | 22.0 |
| TOTAL | 116.0 |

| ZONA 5 | |
|---|---|
| 1.- Los Almendros-Calpules-El Zarzal | 12.0 |
| 2.- El Zarzal-Quebrada Arriba-Las Cañas-Azabache | 23.0 |
| 3.- Calpules-Quebrada Larga-Pie de la Cuesta-Villa Santa-Los Trozos-Santa Elena-Palmilla-Troncones-Joyas Galanas-La Cooperativa | 49.0 |
| 4.- Santa María-Santa Elena | 11.0 |
| 5.- Río Siales-Sonaguera | 10.0 |
| TOTAL | 105.0 |

| ZONA 6 | |
|---|---|
| 1.- Los Planes-Trojes | 36.0 |
| TOTAL | 36.0 |

| | LONGITUD (KMS.) |
|---|---|
| LONGITUD TOTAL DEPARTAMENTO DE EL PARAISO | 360.0 |

DEPARTAMENTO DE FRANCISCO MORAZAN

ZONA 1

| | | |
|---|---|---|
| 1.- | Linaca-Piedra Grande-Calaire-El Rincón ..... | 7.1 |
| 2.- | El Encanto-La Estancia-El Terrero ..... | 2.6 |
| 3.- | Los Ranchos-Las Moras-El Tule ..... | 3.3 |
| 4.- | El Terrero-Santa Elena-Aguacate Arriba-Aguacate Abajo, Acceso a Yucuma y El Mozotal ..... | 10.4 |
| 5.- | Motuas-El Carrizal-Las Trancas-El Boquerón ..... | 9.1 |
| | TOTAL ..... | 32.5 |

ZONA 2

| | | |
|---|---|---|
| 1.- | San Matías-La Lagunita-Ocote Vuelto-La Laguna del Panal-El Quiscamote ..... | 13.0 |
| 2.- | Ojojona-Guarisne-Llano de Juán García-Zurcos de Caña-El Aguacatal-Sabana del Conejo-Lepaterique (Los Ranchos) ..... | 30.0 |
| 3.- | La Calera-Las Olominas-La Sabana ..... | 10.0 |
| 4.- | El Platanar-Managuara Arriba-El Platanar ..... | 5.0 |
| | TOTAL ..... | 58.0 |

ZONA 3

| | | |
|---|---|---|
| 1.- | El Jicarito-Coa Arriba-Río Hondo ..... | 30.0 |
| 2.- | Carretera pavimentada Olancho-Agalteca ..... | 28.0 |
| 3.- | Ilamapa-La Laguna-Mata de Plátano-Pueblo Nuevo ..... | 21.0 |
| 4.- | Los Izotes-San Antonio de Los Pastos-Jalapa-La Primera Sabana. | 15.0 |
| 5.- | Agalteca-Zinguizapa-Trinidad de Quebradas-San Isidro-Vallecito | 31.0 |
| | TOTAL ..... | 125.0 |

ZONA 4

| | | |
|---|---|---|
| 1.- | La Cantadora-Los Limones-Jutiapa Abajo-Los Planes-El Chaparro. | 10.4 |
| | TOTAL ..... | 10.4 |

ZONA 5

| | | |
|---|---|---|
| 1.- | Valle de Angeles-San Juán de Flores ..... | 22.0 |
| 2.- | Desvío a Miravalle-Miravalle-Ojo de Agua-San Luis..... | 10.5 |
| 3.- | Cofradía-Yamaguare-San Luis-Las Delicias-El Zancudero..... | 21.0 |
| 4.- | San Juán de Flores-Cofradía-Joyas de Carvallo ..... | 25.0 |
| | TOTAL ..... | 78.5 |

| ZONA 6 | LONGITUD (KMS.) |
|---|---|
| 1.- Santa Lucía - La Montañita | 10.0 |
| TOTAL | 10.0 |

| ZONA 7 | |
|---|---|
| 1.- Salalaica-Desvío carretera El Zamorano | 25.0 |
| 2.- San Buenaventura-Nueva Armenia | 26.0 |
| TOTAL | 51.0 |

| ZONA 8 | |
|---|---|
| 1.- Orica-El Portillo de Córdoba-Urrutia-El Escaño de Tepale | 30.0 |
| TOTAL | 30.0 |

| ZONA 9 | |
|---|---|
| 1.- Concepción de María-San Marcos de Curarén | 12.0 |
| 2.- San Miguelito-La Libertad | 4.0 |
| TOTAL | 16.0 |

| | |
|---|---|
| LONGITUD TOTAL DEPARTAMENTO FRANCISCO MORAZAN | 411.4 |

DEPARTAMENTO DE INTIBUCA

| ZONA 1 | |
|---|---|
| 1.- Dolores-San Miguelito | 13.5 |
| 2.- El Comedero-Segua | 10.0 |
| 3.- Toco-Chupocay | 8.0 |
| TOTAL | 31.5 |

| ZONA 2 | |
|---|---|
| 1.- San Juán-Cataulaca-Cocire-San José | 14.0 |
| 2.- San Juán-El Peloncito | 7.5 |
| 3.- Acceso al Espinal | 2.5 |
| 4.- Soledad-Lomas del Horno | 2.0 |
| TOTAL | 26.0 |

| | |
|---|---|
| LONGITUD TOTAL DEPARTAMENTO DE INTIBUCA | 57.5 |

DEPARTAMENTO DE LA PAZ

| ZONA 1 | LONGITUD (KMS.) |
|---|---|
| 1.- Santa María-Santiago de Puringla-San Antonio ..... | 8.5 |
| 2.- Santa María-Agua Blanca-San José..... | 9.0 |
| TOTAL ..... | 17.5 |

| ZONA 2 | |
|---|---|
| 1.- Opatoro-Guajiquiro ..... | 14.0 |
| TOTAL ..... | 14.0 |

| | |
|---|---|
| LONGITUD TOTAL DEPARTAMENTO DE LA PAZ ..... | 31.5 |

DEPARTAMENTO DE LEMPIRA

| ZONA 1 | |
|---|---|
| 1.- Las Flores-Lepaera-San Jose-El Belloto-Las Sandías-El Benque-Gualciras-La Unión ..... | 46.0 |
| 2.- Siguatepeque (carretera Gracias-Sta. Rosa)-Moaca-Consolación-El Ocotillo-El Carmen-Plan Grande ..... | 23.0 |
| TOTAL ..... | 69 0 |

| | |
|---|---|
| LONGITUD TOTAL DEPARTAMENTO DE LEMPIRA ..... | 69.0 |

DEPARTAMENTO DE OCOTEPEQUE

| ZONA 1 | |
|---|---|
| 1.- San Marcos-Santa Teresa ..... | 8.0 |
| 2.- San Francisco del Valle-El Sile-El Rodeo ..... | 7.5 |
| TOTAL ..... | 15.5 |

| ZONA 2 | |
|---|---|
| 1.- Carretera de Occidente-Dolores Merendón ..... | 13.0 |
| 2.- La Labor-Tershapa-El Rosario-Los Ranchos-Fraternidad ..... | 18.0 |
| TOTAL ..... | 31.0 |

| | |
|---|---|
| LONGITUD TOTAL DEPARTAMENTO DE OCOTEPEQUE ..... | 46.5 |

DEPARTAMENTO DE OLANCHO

| ZONA 1 | LONGITUD (KMS.) |
|---|---|
| 1.- Gualaco-Chindona-El Aguacate-San Lorenzo | 30.0 |
| 2.- Manto-La Guata | 40.0 |
| 3.- El Naranjal-El Guayabito | 5.0 |
| 4.- La Carta-Guistaca-Los Horcones-La Laguna-San Antonio y accesos al Rincón, San Benito y El Tizate | 24.0 |
| 5.- Talanguera-El Trapiche-Caloma-Boca del Monte-Paso del Pito | 16.0 |
| 6.- La Soledad-El Pataste-El Peñasquito y acceso al Bebedero | 14.0 |
| 7.- El Higuerito-Guasmiles-Santa Elena-El Caulote-El Carbonal-Jimasque-El Bebedero-La Soledad-San Antonio | 52.0 |
| 8.- Concordia-El Naranjal-Tablón-Villa de Fátima-Lavaderos | 12.0 |
| 9.- El Rosario-La Ceiba-La Empalizada-Ocotal del Naipe-El Cuabano-La Cañada del Novillo-San Antonio | 26.0 |
| 10- San Antonio-Quebrada Honda-El Barro-Yocón | 19.0 |
| 11- El Naranjal-Las Casitas-La Laguna-Terreros Blancos-La Guadalupe-La Concepción | 32.0 |
| TOTAL | 270.0 |

| ZONA 2 | |
|---|---|
| 1.- La Venta-La Jagua-El Barranco-El Barrero-El Zope-El Maguelar-El Potrero | 28.0 |
| 2.- El Barrero-Las Trojas-El Quebrachal | 13.0 |
| 3.- Villa San Carlos-El Jobo-La Aguja-El Ciruelo | 30.0 |
| 4.- Acceso a La Masica-El Limonal-Charrascas | 7.0 |
| 5.- Villa San Carlos-Madre Cacao-Dos Ríos | 6.0 |
| 6.- Buenos Aires-San Martín | 5.0 |
| TOTAL | 89.0 |

| ZONA 3 | |
|---|---|
| 1.- Dulce Nombre de Culmí-El Cerro-Wampusito-Pueblo Viejo-San Pedro Pisijires | 22.0 |
| 2.- Wampú-San José del Guamo | 24.0 |
| 3.- San Pedro Pisijires-Marañones-La Colonia-La Pimienta-Las Marías | 23.0 |
| TOTAL | 69.0 |

| ZONA 4 | |
|---|---|
| 1.- Terrero Blanco-El Ocotillal-Guapinoles-San Pedro Arriba | 73.0 |
| 2.- Zopilotepe-Las Llaves-El Retiro-El Bijao-Los Hornos-El Peligro y acceso al Rusio | 47.0 |
| TOTAL | 120.0 |

| | |
|---|---|
| LONGITUD TOTAL DEPARTAMENTO DE OLANCHO | 548.0 |

DEPARTAMENTO DE SANTA BARBARA

| ZONA 1 | LONGITUD (KMS.) |
|---|---|
| 1.- Río Blanco-San Isidro-San Luis ..... | 30.0 |
| 2.- Virrey-Río Blanco-Palma Real-El Chile ..... | 38.0 |
| 3.- San Isidro-Buena Vista-La Ruidosa-El Triunfo ..... | 30.0 |
| TOTAL ..... | 98.0 |

| ZONA 2 | |
|---|---|
| 1.- Loma Larga-Colinas ..... | 7.5 |
| 2.- San José de Colinas-Las Joyas-San Luis Planes-San José de Colón-Cacaulapa ..... | 15.0 |
| TOTAL ..... | 22.5 |

| ZONA 3 | |
|---|---|
| 1.- Quebrada Grande-Valle de La Cruz-Atima-Berlín ..... | 25.0 |
| TOTAL ..... | 25.0 |

| | |
|---|---|
| LONGITUD TOTAL DEPARTAMENTO DE SANTA BARBARA ..... | 145.5 |

DEPARTAMENTO DE VALLE

| ZONA 1 | |
|---|---|
| 1.- Carretera Panamericana-El Chorro-Alianza, Desvío (San José)-Santa Rita ..... | 20.0 |
| 2.- Carretera Panamericana-Mesatepe-El Guayabo-Paso Real ..... | 7.0 |
| 3.- Carretera Panamericana-El Tránsito-La Baraja-Paso Real-El Zorrillo-Los Luises-El Aceituno ..... | 17.0 |
| TOTAL .... | 44.0 |

| ZONA 2 | |
|---|---|
| 1.- Carretera Panamericana-Quebrichito-Las Minitas-Macuelizo-Los Comales-Nagarejo-Agua Fía, Playa Grande-Las Palmas, Nagarejo-El Vado, acceso a La Brea ..... | 19.0 |
| TOTAL..... | 19.0 |

| | |
|---|---|
| LONGITUD TOTAL DEPARTAMENTO DE VALLE ..... | 63.0 |

DEPARTAMENTO DE YORO

| ZONA 1 | LONGITUD (KMS.) |
|---|---|
| 1.- La Habana-El Rosario-Locomapa-Mezcales ..... | 35.0 |
| TOTAL ..... | 35.0 |

| ZONA 2 | |
|---|---|
| 1.- Yorito-Pueblo Viejo-Santa Marta-Paujiles-El Ocotal ..... | 17.0 |
| 2.- Yorito-Vallecillo-Mina Honda-El Ocote ..... | 7.0 |
| 3.- Yorito-Jalapa-San Antonio-El Desmonte-Sulaco ..... | 26.0 |
| 4.- San Antonio-Las Cañas-Victoria ..... | 18.0 |
| TOTAL ..... | 68.0 |

LONGITUD TOTAL DEL DEPARTAMENTO DE YORO ..... 103.0

DEPARTAMENTO DE FRANCISCO MORAZAN, EL PARAISO Y CHOLUTECA.

| ZONA 1 | LONGITUD (KMS.) |
|---|---|
| 1.- Lizapa-Morolica ..... | 76.0 |
| TOTAL ..... | 76.0 |

GRAN TOTAL ..... 3,002.6 KMS.

3. IMPACT IDENTIFICATION AND EVALUATION FORM

| Impact Areas and Sub-Areas | Impact Identification and Evaluation |
|---|---|
| **A. LAND USE** | |
| 1. Changing the character of the land through: | |
| a. Increasing the population | N |
| b. Extracting natural resources | N |
| c. Land clearing | L |
| d. Changing soil character | N |
| 2. Altering natural defenses | L |
| 3. Foreclosing important uses | N |
| 4. Jeopardizing man or his works | N |
| 5. Other factors | |
| _____ | _____ |
| _____ | _____ |
| **B. WATER QUALITY** | |
| 1. Physical state of water | L |
| 2. Chemical and biological states | N |
| 3. Ecological balance | L |
| 4. Other factors | |
| _____ | _____ |
| _____ | _____ |

1/ Symbol meanings:
N - NO environmental impact
L - LITTLE environmental impact
M - MODERATE environmental impact
H - HIGH environmental impact
U - UNKNOWN environmental impact

BEST AVAILABLE COPY

IMPACT IDENTIFICATION AND EVALUATION FORM

| | Impact Identification and Evaluation |
|---|---|
| **C. ATMOSPHERIC** | |
| 1. Air additives | N |
| 2. Air pollution | L |
| 3. Noise pollution | L |
| 4. Other factors<br>Short Term Construction Air Pollution | |
| **D. NATURAL RESOURCES** | |
| 1. Diversion, altered use of water | L |
| 2. Irreversible, inefficient commitments | N |
| 3. Other factors | |
| **E. CULTURAL** | |
| 1. Alteri[illegible] physical symbols | N |
| 2. Dilution of cultural traditions | N |
| 3. Other factors | |
| **F. SOCIO-ECONOMIC** | |
| 1. Changes in economic/employment patterns | M |
| 2. Changes in population | L |
| 3. Changes in cultural patterns | L |
| 4. Other factors | |

Best Available Document

IMPACT IDENTIFICATION AND EVALUATION FORM

| | Impact Identification and Evaluation |
|---|---|
| **G. HEALTH** | |
| 1. Changing a natural environment | L |
| 2. Eliminating an ecosystem element | N |
| 3. Other factors | |
| _____ | _____ |
| _____ | _____ |
| **H. GENERAL** | |
| 1. International impacts | N |
| 2. Controversial impacts | N |
| 3. Larger program impacts | L |
| 4. Other factors | |
| _____ | _____ |
| _____ | _____ |
| **I. OTHER POSSIBLE IMPACTS (not listed above)** | |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

BEST AVAILABLE COPY

PROJECT: RURAL ROADS II
EXECUTING UNIT OF THE PROJECT
ACTIVITY: ADMINISTRATION
SOURCE OF FUNDS: GOVERNMENT OF HONDURAS COUNTERPART (U.S. $)

| ORDER NUMBER | POSITIONS | QUANTITY | MONTHLY SALARY | 1986 | 1987 | 1988 | 1989 | TOTAL |
|---|---|---|---|---|---|---|---|---|
| 1. | Executing Unit Head | 1 | 2,000 | 24,000 | 24,000 | 24,000 | 24,000 | 96,000 |
| 2. | Assistant Engineer | 1 | 1,750 | 21,000 | 21,000 | 21,000 | 21,000 | 84,000 |
| 3. | Agronomist | 3 | 1,500 | 54,000 | 54,000 | 54,000 | 54,000 | 216,000 |
| 4. | Administrator | 1 | 750 | 9,000 | 9,000 | 9,000 | 9,000 | 36,000 |
| 5. | Analysis Man | 3 | 600 | 21,600 | 21,600 | 21,600 | 21,600 | 86,400 |
| 6. | Social Promoter | 1 | 500 | 6,000 | 6,000 | 6,000 | 6,000 | 24,000 |
| 7. | Accountants | 2 | 400 | 9,600 | 9,600 | 9,600 | 9,600 | 38,400 |
| 8. | Mechanic | 1 | 425 | 5,100 | 5,100 | 5,100 | 5,100 | 20,400 |
| 9. | Procurement Officers | 2 | 375 | 9,000 | 9,000 | 9,000 | 9,000 | 36,000 |
| 10. | Secretaries | 3 | 300 | 10,800 | 10,800 | 10,800 | 10,800 | 43,200 |
| 11. | Warehouse Man | 1 | 300 | 3,600 | 3,600 | 3,600 | 3,600 | 14,400 |
| 12. | Drivers | 2 | 250 | 6,000 | 6,000 | 6,000 | 6,000 | 24,000 |
| 13. | Messenger | 1 | 170 | 2,040 | 2,040 | 2,040 | 2,040 | 8,160 |
| 14. | Mechanic Helper | 1 | 170 | 2,040 | 2,040 | 2,040 | 2,040 | 8,160 |
| 15. | Maid | 1 | 150 | 1,800 | 1,800 | 1,800 | 1,800 | 7,200 |
| TOTAL PERSONNEL | | | | 185,580 | 185,580 | 185,580 | 185,580 | 742,320 |
| OTHER COSTS | | | | | | | | |
| | Operating Costs | | | 12,500 | 12,500 | 12,500 | 12,500 | 50,000 |
| | Per Diem | | | 6,300 | 6,300 | 6,300 | 6,300 | 25,200 |
| | Fuels & Lubricants | | | 18,550 | 18,550 | 18,550 | 18,550 | 74,200 |
| | Drafting & Design | | | 20,000 | 20,000 | 20,000 | 20,000 | 80,000 |
| | Soil & Laboratory Technicians | | | 5,000 | 5,000 | 5,000 | 5,000 | 20,000 |
| | Total Other Costs | | | 62,350 | 62,350 | 62,350 | 62,350 | 249,400 |
| GRAND TOTAL | | | | 247,930 | 247,930 | 247,930 | 247,930 | 991,720 |

ANNEX No. T

PROJECT: RURAL ROADS II
EXECUTING UNIT OF THE PROJECT
ACTIVITY: OPERATION AND SUPERVISION
SOURCE OF FUNDS: GOVERNMENT OF HONDURAS COUNTERPART (U.S. $)

| ORDER NUMBER | POSITIONS | QUANTITY | MONTHLY SALARY | 1986 | 1987 | 1988 | 1989 | TOTAL |
|---|---|---|---|---|---|---|---|---|
| 1 | Supervisors Engineers | 3 | 2,000 | 72,000 | 72,000 | 72,000 | 72,000 | 288,000 |
| 2 | Project Engineers | 14 | 1,750 | 189,000(9)* | 294,000 | 294,000 | 231,000(11)* | 1,008,000 |
| 3 | Economist | 1 | 1,500 | 18,000 | 18,000 | 18,000 | 18,000 | 72,000 |
| 4 | Foreman | 21 | 600 | 79,200(11)* | 151,200 | 151,200 | 108,000(15)* | 489,600 |
| 5 | Earth Work Foreman | 11 | 450 | 59,400 | 59,400 | 59,400 | 59,400 | 237,600 |
| 6 | Accountants | 11 | 350 | 46,200 | 46,200 | 46,200 | 46,200 | 184,800 |
| 7 | Social Promoters | 3 | 500 | 18,000 | 18,000 | 18,000 | 18,000 | 72,000 |
| 8 | Topographers | 6 | 450 | 16,200(3)* | 32,400 | 32,400 | 32,400 | 113,400 |
| 9 | Mechanic | 1 | 425 | 5,100 | 5,100 | 5,100 | 5,100 | 20,400 |
| 10 | Levelman | 2 | 300 | 7,200 | 7,200 | 7,200 | 7,200 | 28,800 |
| 11 | Drivers | 34 | 250 | 72,000(24)* | 102,000 | 102,000 | 90,000(30)* | 366,000 |
| 12 | Timekeepers | 44 | 200 | 105,600 | 105,600 | 105,600 | 105,600 | 422,400 |
| 13 | Chainmen | 12 | 225 | 32,400 | 32,400 | 32,400 | 32,400 | 129,600 |
| 14 | Mechanic Helper | 2 | 170 | 4,080 | 4,080 | 4,080 | 4,080 | 16,320 |
| 15 | Rodman | 12 | 100 | 14,400 | 14,400 | 14,400 | 14,400 | 57,600 |
| 16 | Laborers | 48 | 100 | 57,600 | 57,600 | 57,600 | 57,600 | 230,400 |
| TOTAL PERSONNEL | | | | 796,380 | 1,019,580 | 1,019,580 | 901,380 | 3,736,920 |
| OTHER COSTS | | | | | | | | |
| | Office Rent | | | 4,800 | 4,800 | 4,800 | 4,800 | 19,200 |
| | Fuel & Lubricants | | | 118,350 | 118,350 | 118,350 | 118,350 | 473,400 |
| | Vehicles Reparating | | | 57,720 | 57,720 | 57,720 | 57,720 | 230,880 |
| | Tires | | | 56,254 | 56,254 | 56,254 | 56,254 | 225,016 |
| TOTAL OTHER COSTS | | | | 237,124 | 237,124 | 237,124 | 237,124 | 948,496 |
| GRAND TOTAL | | | | 1,033,504 | 1,256,704 | 1,256,704 | 1,138,504 | 4,685,416 |