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DEPARTMENT OF STATE  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
Washington, D.C. 20523

PROJECT PAPER

GUATEMALA

INTEGRATED AREA DEVELOPMENT STUDIES

Project Number: 520-0249

LAC/DR-78-12

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<b>AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I</b>		<b>1. TRANSACTION CODE</b> <input checked="" type="checkbox"/> A    A = ADD <input type="checkbox"/> C    C = CHANGE <input type="checkbox"/> D    D = DELETE	<b>PAF</b> <b>2. DOCUMENT CODE</b> 5
<b>3. COUNTRY/ENTITY</b> GUATEMALA		<b>4. DOCUMENT REVISION NUMBER</b> <input type="checkbox"/>	
<b>5. PROJECT NUMBER (7 digits)</b> [520-0249]	<b>6. BUREAU/OFFICE</b> A. SYMBOL    B. CODE IAC            [3]		<b>7. PROJECT TITLE (Maximum 40 characters)</b> [Integrated Area Dev. Studies]
<b>8. PROJECT APPROVAL DECISION</b> <input checked="" type="checkbox"/> A    A = APPROVED <input type="checkbox"/> D    D = DISAPPROVED <input type="checkbox"/> DE   DE = DEAUTHORIZED		<b>9. EST. PERIOD OF IMPLEMENTATION</b> YRS. [02]    QTRS. [ ]	

10. APPROVED BUDGET AID APPROPRIATED FUNDS (\$000)									
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY 78		H. 2ND FY 79		K. 3RD FY	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
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TOTALS				220		278			

A. APPROPRIATION	N. 4TH FY		O. 5TH FY		LIFE OF PROJECT		11. PROJECT FUNDING AUTHORIZED (ENTER APPROPRIATE CODE(S)) 1 = LIFE OF PROJECT 2 = INCREMENTAL LIFE OF PROJECT	A. GRANT	B. LOAN
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TOTALS					498		C. PROJECT FUNDING AUTHORIZED THRU		FY [79]

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED (\$000)				13. FUNDS RESERVED FOR ALLOTMENT				
A. APPROPRIATION	B. ALLOTMENT REQUEST NO. _____			TYPED NAME (Chief, NGR/FM/PSD)				
	C. GRANT	D. LOAN						
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TOTALS		220						

14. SOURCE/ORIGIN OF GOODS AND SERVICES     000     941     LOCAL     OTHER \_\_\_\_\_

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED \_\_\_\_\_

FOR PPC/PIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL USAID/ Guatemala	17. ACTION DATE MM DD YY 05 18 78	18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE MM DD YY

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

PART II

NAME OF COUNTRY/ENTITY: Guatemala/USAID

NAME OF PROJECT: Integrated Area  
Development Studies

NUMBER OF PROJECT: 520-0249

Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a grant to the Government of Guatemala, the Cooperating Country, of not to Exceed Two Hundred Twenty Thousand United States Dollars (\$220,000) ("Authorized Amount") to help in financing certain foreign exchange and local currency costs of goods and services required for the Project as described in the following paragraph. The Project consists of the development and execution of a systematic planning methodology for determining the needs and priorities for economic and social infrastructure and services to improve the quality of life and increase incomes of rural Guatemalans.

I approve a total level of A.I.D. appropriated funding planned for this Project of not to exceed four hundred ninety-eight United States Dollars (\$498,000), during the period FY 1978 through FY 1979. I approve further increments during that period of grant funding up to \$278,000, subject to the availability of funds in accordance with AID allotment procedures.

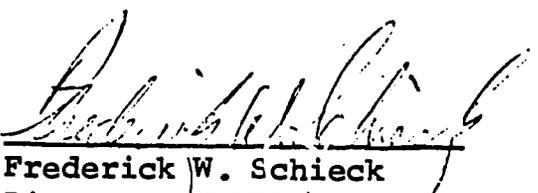
I hereby authorize the initiation of the negotiation and execution of the Project Agreement in accordance with A.I.D. regulations and Delegations of Authority. Such Agreement shall be subject to the following terms, covenants and conditions, in addition to such other terms and conditions as A.I.D. may deem appropriate.

a. Source and Origin of Goods and Services

Goods and services financed by A.I.D. under the Project shall have their source and origin in the Cooperating Country, or in the United States, except as A.I.D. may otherwise agree in writing.

b. Staffing Pattern

Prior to any disbursement, or the issuance of any commitment documents under the Project Agreement to finance costs of local contract technicians and surveyors, Grantee shall furnish in form and substance satisfactory to A.I.D., a staffing pattern for the implementation units to be located in the Ministry of Agriculture and Municipal Development Institute (INFOM) indicating the assignment of Project and non-Project funded personnel to be furnished by the participating agencies.

Signature:   
Frederick W. Schieck  
Director, USAID/Guatemala

Clearances: CDKoone AK ORD  
ASilver adi PRM  
for CFlinner SE CONT #1  
BVeret BT RLA  
LHunsaker GP ADMIN 5/18  
ECarrasco GH ADIR

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Department of State

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TELEGRAM

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PRC  
CTR  
AIDAC

CMGT F.O. 11652: N/A

FM SUBJ: INTEGRATED AREA DEVELOPMENT STUDIES - PROJECT 520-0249

ED SUBJECT PAF AND PROJECT PAPER APPROVED HERE JUNE 5, 1978  
AA/DS AND POUCHED TO BETSY CARTER LAC/CEN. APPRECIATE ALLOTMENT  
OA \$200,000 SOONEST TO ENABLE US TO EXECUTE PROJECT AGREEMENT  
AND ISSUE PIO/T TO INITIATE TITLE XII SELECTION PANEL ACTION.  
CONGRESSIONAL NOTIFICATION NOT REQUIRED.  
ANDREWS

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# PROJECT PAPER

## GUATEMALA - INTEGRATED AREA DEVELOPMENT STUDIES

<u>Table of Contents</u>		Page No.
PART I -	<u>Summary &amp; Recommendations</u>	
A.	Project Facesheet .....	1
B.	Recommendations .....	2
C.	Description of the Project .....	2
D.	Summary and Findings .....	5
PART II -	<u>Project Background</u>	6
A.	Project Setting .....	6
B.	Project Rationale .....	8
PART III -	<u>Project Description</u>	13
A.	Goal .....	13
B.	Purpose .....	13
C.	Detailed Project Description .....	14
1.	Introduction .....	14
2.	Project Outputs .....	15
a.	Study One: Inventory .....	15
	of available Infrastruc- ture and Services: Definition of Guatemala's Rural/Urban Hierarchy.....	15
b.	Study Two: Inventory of the Natural Resource Base and Determination of its Economic Potential for Each Location in the Study Area.....	18

	c. Combining the Information provided by the Two Studies and Initial Screening of Investment Possibilities.....	22
	3. Utilization of the Project Results.....	26
	D. Project Inputs .....	27
PART IV	<u>Project Analyses</u> .....	29
	A. Technical Analysis .....	29
	1. Appropriateness of Analytical Techniques. ....	29
	2. Feasibility of Implementation Methodology. ....	31
	B. Financial Plan .....	36
	C. Social Analysis .....	41
	D. Economic Analysis .....	42
PART V	<u>Project Implementation Plan</u> .....	45
	A. Administrative Arrangements.....	45
	1. INFOM, USPA and Implementation Arrangements for Study One.....	47
	2. UPE and Implementation Arrangements for Study Two. ....	50
	3. Updating and Continuation of Data Base.....	53

B. Implementation Schedule ..... 54  
C. Evaluation Plan ..... 58

Logical Framework

ANNEXES

- I - MAP OF AID TARGET AREA
- II - ENVIRONMENTAL IMPACT STATEMENT
- III - MAPS ILLUSTRATING THE TYPE OF INFORMATION TO BE DERIVED FROM STUDY ONE AND TWO
- IV - ILLUSTRATION OF AN APPLICATION OF THE DATA AND METHODOLOGY.

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AGENCY FOR INTERNATIONAL DEVELOPMENT  
**PROJECT PAPER FACESHEET**

1. TRANSACTION CODE  
 A ADD  
 C CHANGE  
 D DELETE

2. DOCUMENT CODE  
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3. COUNTRY/ENTITY  
GUATEMALA

4. DOCUMENT REVISION NUMBER  
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7. PROJECT TITLE (Maximum 40 characters)  
Integrated Area Develop. Studies

8. ESTIMATED FY OF PROJECT COMPLETION  
FY 80

9. ESTIMATED DATE OF OBLIGATION  
 A. INITIAL FY 78 B. QUARTER 3  
 C. FINAL FY 79 (Enter 1, 2, 3, or 4)

10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$1 - )

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL	109.1	110.9	220.0	220.0	278.0	498.0
(GRANT)	( 109.1 )	( 110.9 )	( 220.0 )	( 220.0 )	( 278.0 )	( 498.0 )
(LOAN)	( )	( )	( )	( )	( )	( )
OTHER U.S. 1.						
2.						
HOST COUNTRY	15.0	150.0	165.0	35.0	342.0	377.0
OTHER DONOR(S)						
TOTALS	124.1	260.9	385.0	255.0	620.0	875.0

11. PROPOSED BUDGET APPROPRIATED FUNDS (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY		H. 2ND FY		K. 3RD FY	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) FN	281	063		220.0		278.0			
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TOTALS									

A. APPROPRIATION	N. 4TH FY		O. 5TH FY		LIFE OF PROJECT		12. IN-DEPTH EVALUATION SCHEDULED
	G. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN	
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13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

2 1 = NO  
2 = YES

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: *Frederick W. Schieck*  
Frederick W. Schieck

TITLE: Director, USAID/Guatemala

DATE SIGNED: MM DD YY  
06 05 78

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION  
MM DD YY

B. Recommendations

Approval is recommended for a grant in the amount of \$ 498,000 over a two-year life of project to assist Government of Guatemala to evolve and implement a systematic methodology for planning public investments in infrastructure and increased services in rural Guatemala.<sup>1/</sup>

C. Description of the Project

1. Grantee

The Government of Guatemala will be the Grantee. Responsibility for implementing the program and administering the grant assistance will be assigned to the Ministry of Agriculture and the National Institute for Municipal Development (INFOM). The Sectoral Planning Unit (USPA), and the Studies and Projects Unit (UEP), will be the units with major responsibility for the Ministry of Agriculture's implementation activities.

In addition to the implementing agencies, a Steering Committee will be formed from representatives of the various GOG agencies which will benefit from the data generated and may be expected to utilize the planning methodology to be developed. The purpose of this committee will be to assure the relevance of the data collected and to facilitate broad application of the planning methodology at the completion of the project.

2. Project Summary

The sector goal which this project addresses is to improve the quality of life and increase of incomes of Guatemalan's in rural areas. In addressing this goal, the Mission has

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<sup>1/</sup> Infrastructure includes access roads, bridges, markets, slaughterhouses, potable water, sewage, schools, health facilities, electricity, community centers. Services include agricultural extension, credit, input supply & product marketing, commercial artisanry and small industry credit, and social services related to health and education.

focused its efforts on an area consisting of 206 municipalities which were defined as economically marginal or submarginal based upon a series of indicators of social and economic well-being. 1/ Many localities within the target area still lack access to the most basic infrastructure and public services to stimulate their development. Most are lacking in farm-to-market roads, accessible input and product markets, irrigation, energy for irrigation, and other agricultural production-related infrastructure. The coverage of services such as credit, extension, health posts and education is equally limited.

The problem which emerges, however, is how to precisely define the nature and extent of these constraints in order to establish priorities for meeting them such that (1) those most in need might receive the greatest benefit, and (2) that each added component of infrastructure or services provides the maximum impact upon the economic growth and quality of life in the community. Furthermore, it has become more and more apparent that the available data base and the planning process currently employed in Guatemala are not sufficient for this purpose.

In view of these findings, this project proposes to assist the GOG to evolve and implement a systematic methodology for (1) determining the type of infrastructure and services most required in each municipality, and (2) establishing priorities among communities for such investments.

The proposed project consists of the following steps:

- a. Conduct a study of the nature and spatial distribution of the existing infrastructure and services in each of 157

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1/ A municipality is a political subdivision similar to a county or parish in the United States. See Annex I for map illustrating the location of the submarginal municipalities.

municipalities, 1/ and analyze their hierarchical inter-relationships.

- b. Conduct a study of the quality and spatial distribution of the natural resources, and their current and potential economic use of each of the same municipalities.
- c. Classify and map the information forthcoming from the above studies in such a way that the analyst can determine the suitability of an investment according to:
  - i. The economic potential of the natural resource base at each investment site.
  - ii. The need for specific types of public infrastructure and services in each site.
  - iii. The suitability of locating an investment at each site given the spatial relationship of that site to the surrounding localities.
- d. Initial screening of investment possibilities, applying appropriate economic and social criteria, to establish priority investment programs and determine the most indicated sites for such investments.

The ultimate beneficiaries of this effort to improve the investment planning process will be the population of the 157 poorest municipalities within AID's target area. The direct benefits will be derived from subsequent investments in public infrastructure and services which address the most critical needs identified for each community and are appropri-

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1/ A total of 206 municipalities have been selected as the AID target area. (See 1978 DAP for details of the selection process and location of the municipalities). This project has established the 157 municipalities identified as submarginal as a minimum goal with the intention of evaluating all 206 municipalities if after the project is underway it is determined that the larger number can be achieved within the time frame and funding available.

ate to development potential of each location.

USAID plans to develop its programs for providing critical small scale infrastructure and needed services based upon the findings derived from this project. Utilizing the information USAID will be able to identify and pursue needs for infrastructure of a scale which corresponds directly to the needs of the intended beneficiaries.

Improving planning is a critical intermediate step to assure the appropriateness of later investment programs and to maximize their cost-effectiveness in bringing about those changes which will increase the incomes and well-being of the small farmers, landless laborers, artisans, small businessmen and their families who live in the target area.

### C. Summary Findings

The Project Committee has reviewed the technical, economic, social and financial aspects of the proposed project. On the basis of this review and the investigations of specialized consultants during the project design, the Committee recommends that a grant be authorized to the Government of Guatemala not to exceed \$498,000.

This recommendation is based upon the findings that current process of planning of public investment programs is too dispersed, based upon inadequate data, and is, as a whole, not undertaken in a systematic manner. As a consequence, USAID believes that an improved planning process, such as this project proposes to develop, is fundamental for guiding the future investment programs which will provide infrastructure and needed services in rural Guatemala. It is the Mission's judgement that with the data to be generated during this project, and a systematic methodology for applying these data, the GOG will be able to improve decision-making with respect to public investment choices for both internal and international funding. (See Annex IV for an illustration of how the forthcoming data and methodology could be applied to an investment project).

Given that the Project consists of two complementary studies and a planning exercise, it has been determined that its execution will have no detrimental impact upon the environment. (See environmental impact determination appended as Annex II). Therefore, it is

expected that the Project will have a positive long-term impact as a result of encouraging public investments which facilitate development in directions which reflect appropriate use of the natural resource base.

## II. PROJECT BACKGROUND

### A. Project Setting

Guatemala GDP per capita climbed to an estimated \$4.3 billion by 1976 with a major push from record coffee prices. Another prime contributing factor in the jump in GDP was the considerable increase in construction activities in Guatemala City and surrounding areas as a result of reconstruction efforts following the 1976 earthquake and large amounts of local and international investment funds being channelled into new hotels, apartments, and office buildings. But neither the record GDP per capita nor the boom atmosphere of Guatemala City provide a true picture of Guatemala in 1978. In the rural areas, where 70% of the population resides, per capita incomes are well below \$200, more than 80% of the children under the age of five suffer from some form of malnutrition, the crude birth rate exceeds 40 per 1,000; illiteracy is over 50%, only 51% of primary school-age children are in school, there is one doctor for every 4,500 people and life expectancy at birth is about 50 years.

These problems are most acute in 206 municipalities described as the USAID target area. These municipalities were identified through a process of ranking all of the nation's 326 municipalities utilizing a number of indices as indicators of the income, productivity and well-being of their inhabitants. Each municipality was then designated on a relative scale as sub-marginal (157), marginal (49), and developed (120). The 206 municipalities selected as AID's target group covers 70% of the rural population, the poorest segment of that population. Eighty-two percent of the rural Indian population is included in this grouping.

The principal contributing factors to the poverty encountered in this area are (1) the limited land base available to the majority of farm families, (2) under-utilization of available labor resources, (3) lack of appropriate technology resulting in low levels of productivity of both labor and land resources, and (4) inadequate access to

the basic infrastructure and services required for development at the community level. Although these factors are inter-related, the project concerns itself mainly with providing suitable data and analytical foundation for attacking the problem of lack of access to needed infrastructure and services.

Beginning with its second Five-Year Development Plan (1971-1975), the GOG with the assistance of international donors, has turned its attention increasingly to the problems of the rural areas. Major programs were mounted in agricultural research, extension and credit, cooperative, development, schools and health post construction, teacher and health worker training. For example, the Agricultural Development Bank made over 20,000 loans in 1976 and agricultural and credit cooperatives provided credit and other services to another 40,000 small farmers compared with less than 10,000 small farmers who received credit and other services from the GOG and cooperatives in 1971. Over 200 Rural Health technicians are now assigned to work in the rural areas and some 804 new classrooms were built during 1970-74.

This effort to reach out to the rural poor was intended to continue under the 3rd Five-Year Development Plan (1975-1979) as indicated by its stated goal of increasing the proportion of national economic growth commanded by the poorest 50% of the population. Unfortunately, the disastrous earthquake of February 4, 1976, interrupted many of these efforts and there is now a serious question whether the goals of the plan can be achieved without a substantial redirection and a major increase in the size of programs designed to carry it out.

There is some indication that such mid-course corrections may be forthcoming under the recently completed revision of the GOG investment plan for the last years of the 1975-1979 planning period. Major changes appear to be sharply increased level of investment, especially in health and education infrastructure, in order to replace earthquake damaged facilities and at the same time continue expansion of other infrastructure and services in the rural area.

B. PROJECT RATIONALE

The USAID program in Guatemala is directed towards alleviating constraints which impede the realization of increased employment and incomes and improved quality of life for the rural poor majority. Projects in agricultural research, extension, credit, cooperative development, small-scale irrigation, soil conservation rural access roads and agricultural marketing have been designed to assist in increasing small farmer incomes. Projects in school construction, health services, teacher training, construction of municipal infrastructure and services, and rural enterprises development are aimed at improving the quality of life and increasing employment opportunities in the poorer rural areas. These programs have assisted the GOG and the cooperative institutions to expand greatly their outreach capacity.

Since 1973 these efforts have been concentrated on the USAID target area as described earlier. However, there are still major shortfalls in the infrastructure and services required to provide opportunities for the rural poor to improve their incomes and quality of life. For example, only 60,000 of some 250,000 small farmers (3.5 hectares or less) in the target area are participating in GOG or cooperative credit programs; some 1.5 million people do not have ready access to preventative and curative medical services, and adequate bilingual education is available to less than 10% of the Indian children living in rural areas.

These problems are most acute in the small, neglected rural communities known as aldeas and caserios where the majority of the rural population resides. Concern for the lack of infrastructure and services in these small communities and

the smaller county seats (cabeceras municipales) 1/ prompted the USAID to submit two Project Review Papers (Market Towns Services Improvement in 1975 and Community Development in 1976) and a FY 1979 PID (Small Farmer Diversification Systems) for AID/W consideration.

The Market Towns project was postponed after the 1976 earthquake to allow the Municipal Development Institute (INFOM) to concentrate on reconstruction activities financed under the FY 1976 Municipal Earthquake Recovery Loan. The Community Development proposal was set aside in favor of the present approach which provides for closer linkages with local and national government programs. Finally, project design work is commencing on the Small Farmer Diversification Project.

We continue to believe that the substance of these three proposals addresses directly a series of key constraints to increasing income and improving quality of life in the rural areas, principally the inadequacy and/or non-availability of essential public infrastructure and services.

However, the one question which consistently arose in the development of all three proposals (and on which this project focuses) is how to precisely define the nature and extent of these constraints in order to establish priorities for meeting them in a manner such that (1) those most in need (the USAID target group) might receive the greatest benefit from the proposed projects, and (2) each added component of infrastructure or services complements those already existing such that an economic multiplier is achieved from each new investment. Furthermore, it has become more and more apparent during the project development process that the data base and analytical tools available in Guatemala are not sufficient for this purpose.

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1/ Equivalent to a county seat in the United States.

With attention drawn to this problem, it became obvious that the problem was not unique to USAID projects. For example, the GOG and other international agencies have shown interest in determining the feasibility of devising and carrying out intensive, integrated development plans focused upon selected regions of the country. In fact, both the IDB and OAS have been involved in attempts to develop integrated investment plans, one for the Western Highlands and another for the Department of Baja Verapaz. Although it is too early to make far-reaching judgments on these projects, there is no doubt that the lack of recent, reliable disaggregated data on existing infrastructure and services, and economic potential, is severely hampering their efforts.

As an initial step toward resolving this problem, the USAID decided to carry out an intensive review of current planning methodology and resource allocation procedures utilized by the GOG and some non-governmental agencies involved in providing infrastructure and services in the rural areas. The Mission obtained the TDY assistance of Dr. Dean Schreiner from TAB/AGR and contracted the services of Dr. Fred Mann, Dr. Allen Austin and George Muncrief for this purpose.

The principal objectives of the review were to determine (1) to what degree these planning and allocation procedures defined the nature and extent of the requirements for rural infrastructure and services and (2) what criteria were being used to determine relative priorities for meeting these requirements.

As part of the intensive review, Muncrief studied GOG, international and private, non-profit agencies responsible for implementation activities, coordinating functions, or development of information for projects involving investment in infrastructure and services. A questionnaire was developed for the study which addressed the objectives stated below.

1. Describe current practices of GOG and international agencies for determining priorities for investment in rural infrastructure projects.
2. Examine sources of information used in planning for rural infrastructure.
3. Describe and evaluate internal planning process for rural infrastructure.

4. Describe process for reviewing priorities for resource allocation.
5. Describe coordination of activities among government and non-government agencies involved in provision of rural infrastructure.
6. Review current and planned activities and financing for 1977-79 and general plans for 1980-85.

After thorough investigation of current planning and resource allocation procedures, the USAID consultants concluded that Guatemala currently has no systematic planning approach for building infrastructure and providing services in the rural areas. Investment plans of GOG agencies have tended to be based almost exclusively on their functional responsibilities such as roads, education, health services or agricultural infrastructure, with no integration of planning and limited investment in the poorest rural areas of the country. While there is a national development plan with a preliminary regional and urban infrastructure investment strategy, planning and implementation of investments have lacked coordination and have been characterized by frequent overlap and duplication of efforts, and have resulted in little attention being directed to infrastructure investments in areas lower than the cabecera municipal.

As the investigation of current GOG procedures progressed, it became apparent to the USAID consultants and staff that a major missing ingredient in the planning process was a mechanism to translate macro-economic objectives into projects which would assure that equity considerations stressed by GOG could be met. To the extent that a regional development strategy has been articulated, it demonstrates a clear macro-economic bias, tending to emphasize net increases in aggregate economic growth without focusing on the techniques that are required to achieve the equity objectives which are posed in the present 1975-1979 Development Plan. Although regional centers requiring major investments have been identified, the supporting system (infrastructure and services) of lower order centers and surrounding hinterlands has not been defined. Thus, the analysis which would allow rational choices to be made between investments alternatives that would have the greatest impact on the target group living in those areas has not been performed.

In summary, the present "planning" approach most closely adheres to the method of greasing the squeaky wheel. An appropriate model of the current operating environment would show that the investment agencies are subjected to external pressures such as demands from towns and villages for services, political pressures for actions in certain regions, and internal pressure from field workers for action in certain regions or on specific projects. Under such a system, the poorest rural areas often have been and will continue to be at a severe disadvantage bypassed by the main stream of national development efforts.

Further, inappropriate infrastructure investments may be made which are out of phase with level of development of the community and not related to its most pressing needs. Such investments which do not complement existing infrastructure nor relate to the natural and human resources encountered at the local level will have low returns in terms of both income and equity objectives.

In view of the above and the GOG's expressed interest in investing in programs which stress equity as well as productivity, both the GOG and the USAID have come to the conclusion that an alternative planning methodology will have to be adapted and applied to enable governmental and non-governmental agencies to:

1. Define with precision the nature and extent of the requirement for rural infrastructure and services.
2. Establish criteria for determining relative priorities between alternatives for investment in infrastructure and services, and,
3. Determine the roles, responsibilities and coordination required among governmental institutions operating in the rural areas to assure complementarity and avoid costly competition and duplication of efforts.

The working group charged with carrying out the intensive review concluded that such a planning mechanism would benefit from the application of analytical techniques which (1) stress spatial relationships and allow planners to delineate more precisely the coverage of existing infrastructure and services (2) identify the nature and magnitude of gaps in coverage, and (3) develop criteria for assigning priorities for future investments which take into account economic potential and social need.

### III. PROJECT DESCRIPTION

#### A. GOAL

This Project contributes to the overall rural development sector goal of improving the quality of life and increasing the incomes of rural Guatemalans by developing the statistical and analytical basis for improved planning of public investments to provide them with badly needed infrastructure and services.

#### B. PURPOSE

This Project has as its general purpose improving the appropriateness of public investment programs so that they address the highest priority needs for infrastructure and services in the AID target areas, and assuring that the selection of sites for such investments is in accordance with the locations where the need is greatest. To accomplish this general purpose, a more specific purpose of the Project is to assist the GOG to evolve and execute a systematic planning methodology for determining the needs and priorities for economic and social infrastructure and services to achieve the goals stated above.

The basic underlying assumption is that the productivity of firms and the well-being of families in the rural areas is to a large extent dependent upon public investments in infrastructure and services, and that the current process utilized in planning these investments does not adequately reflect and serve the needs of the proposed clientele. Improving the productivity of small farm agriculture and other rural enterprises requires additional inputs such as capital items--seeds, fertilizer, pesticides, power, water, other raw materials--labor, and technical assistance which are either directly or indirectly provided through public sector services. In addition they require a broader based set of inputs that directly and indirectly facilitate the production process, such as access roads, market facilities, health services, education services, potable water systems, irrigation systems and others. For example, better access roads reduce the amount of time a producer requires to move his produce to market and to bring inputs to the point of production. This savings of his time can be used in more directly productive activities. Better

health services may increase the productivity of his work and that of his family and employees. Better educational services may increase his willingness and ability to absorb more technical assistance, as well as increase the productivity of his labor. Thus, improving the target group's access to well chosen economic and social infrastructure and services should contribute to increasing their incomes and employment opportunities.

### C. Detailed Project Description

#### 1. Introduction

To achieve the purposes of the project, AID will assist the GOG with (i) the execution of two interrelated area development studies, and (ii) development of a systematic planning methodology to be used in designing infrastructure and service investment programs. The first study will define the rural/urban hierarchy and will inventory existing infrastructure and services at each level within that hierarchy for the selected area of study.<sup>1/</sup> The other will describe the natural resource base and economic potential of each level of the rural/urban hierarchy. Data from the two studies, when combined, will be utilized in screening of municipalities under study for gaps in infrastructure and services relative to human & natural resources & their productive capacity. The information system established will provide the data base for the analytical process to be used in establishing priorities for investment in additional infrastructure and services in these rural areas. As a prac-

<sup>1/</sup> The area in which both studies will be undertaken consists of the 157 poorest municipalities within the AID target group, those defined as submarginal. If, during the implementation of the Project, it becomes clear that all 206 municipalities can be studied within the time frame and funding provided, it is USAID's intention to expand the effort to also include those municipalities defined as economically marginal.

tical matter, the proposed system can also be used in selecting places for pre-feasibility studies of rural enterprises and identifying on-farm resources improvement projects.

At the end of the project, governmental and non-governmental agencies (including international donors) will be able to utilize this information system and planning process to enable them to:

- (a) Define with precision the location, nature and extent of the requirement for rural infrastructure and services.
- (b) Using agreed upon criteria, determine the relative priorities between locations and alternative investments in infrastructure and services, and,
- (c) Determine the roles, responsibilities and coordination required among governmental institutions operating in the rural areas to assure complementarity and to avoid costly competition and duplication of efforts.

## 2. Project Outputs

- a. Study One: Inventory of Available Infrastructure and Services: Definition of Guatemala's Rural/Urban Hierarchy

This study will utilize central place theory and spatial analysis techniques to investigate and describe the economic and social relationships among rural and urban places within the study area.

A ranking of towns and villages will be made on the basis of infrastructure and services. Infrastructure includes access roads, bridges, markets, slaughterhouses, potable water, sewage, schools, health facilities, electricity and community centers. Services include agricultural extension, credit, inputs supply and product marketing, commercial artisanry and small industry credit, and social services related to health and education.

The lowest order places offer some items and services of frequent necessity and use. Higher order centers offer an increasingly wider selection of goods and services which are purchased or used less frequently. This broader offering is based upon sufficient population to make the provision of goods and services profitable to entrepreneurs. Likewise, public services and infrastructure also require a threshold level of user population.

The enumeration and analysis of the services and commercial activities of places will reveal spatial economies of lower-order centers and help specify micro-poles containing service, commercial and small industrial activities. This data will assist in screening areas for gaps in infrastructure and services relative to human and natural resources and productive activities.

The scope of this study includes the following elements:

- i Definition of the existing hierarchy of poles of development and the supporting system of lower order centers and surrounding hinterlands.
- ii Establishment of the nature of the linkages from the surrounding hinterlands to the various orders of centers and between such centers.
- iii Preparation of an inventory of existing infrastructure and services at each order of rural center.

The outputs of the study will be as follows:

- i Spatially defined inventory of rural infrastructure and services for the study area.
- ii A series of maps and overlays which provide a visual presentation of the spatial distribution of selected rural infrastructure and services in the study area. These maps will be of a size sufficiently large to accommodate the data being presented (probably 1:50,000). In addition, smaller maps will be prepared of selected infrastructure and services of particular interest to

the institutions represented on the Steering Committee. 1/

- iii Infrastructure and services inventory data will be computerized and computer programs will be developed for retrieving the data according to selected spatially defined characteristics considered to be most useful to the institutions represented on the Steering Committee.
- iv A manual will be prepared explaining the preparation of the maps, overlays and computer classification system. This report will describe how to use and interpret the visual materials and computer system and will provide illustrations of types of applications that are possible.
- v A final report will be prepared which describes the results of spatial analysis carried out. This report will include an analysis of the hierarchy of the various levels of market places and their surrounding areas of influence.

The basic approach to be utilized in carrying out this study involves several steps which are expected to extend over a 16-month period. The first task will be to familiarize various government planning agencies with the methodology of spatial definition and analysis. Toward this end, the implementing agency for this study (INFOM), will prepare a "state-of-the art" paper in Spanish which will be used as the basic document for a seminar/workshop for planning personnel. A second and concurrent task will be to assemble all data available at the central government level on population distribution, location of infrastructure and services and the existing road

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1/ The Steering Committee will be composed of representatives of various institutions which will utilize the data and methodology developed when the project is completed (see Part V, A-3 for additional details about the Steering Committee)

network, etc., and to develop an approximation of the existing hierarchy of service centers and market towns in the study area. A 15-20 municipality area will then be selected for the conduct of a pilot survey (which is expected to take one month) of infrastructure, services and trade linkages. The pilot survey results will be tabulated, mapped and analyzed to make adjustments as required in the survey instrument and analytical methodology. The results of the pilot survey will be discussed at a second seminar/workshop of planning personnel which will be followed by a complete survey in the target area. The data generated will then be organized, processed for computer retrieval, and a series of maps developed to illustrate the spatial distribution of selected infrastructure and services. (See Annex III for an illustration of the types of maps which could be generated). This will be followed by the development of the final report setting forth the results and conclusion of the survey.

b. Study Two: Inventory of the Natural Resource Base and Determination of its Economic Potential for Each Location in the Study Area.

This study will describe the natural resource base and economic potential of each level in the same areas as Study one and relate this information to present and possible future investments in infrastructure and services.

Knowledge of the natural resource base is essential to determine the economic potential of any given region. For example, the agricultural production potential of an area is important in determining the number of people that the area can support and their potential income levels. This study will be concerned primarily with establishing the economic potential of each rural service area and determining what improvements can be made in the on-farm resource base and off-farm infrastructure to increase the productivity of all resources in the area thereby raising income levels of both the farm and non-farm rural population. In the case of the on-farm resource base, the resource base assessment will allow judgements to be made about potential income increasing investments for agriculture, such as:

- (1) Are there opportunities for investments in small irrigation projects?
- (2) Are there opportunities for investments in land terracing and other conservation practices?
- (3) Are there more profitable cropping alternatives than presently being practiced?

The kind of resource screenings which will be used in determining whether long-term investments in off-farm infrastructure should be made in a region are of the following type: is the resource base large enough to support or do potential income increases warrant a given size market facility, processing plant, or storage facility; is potential agricultural production sufficient to justify a rural access road, an agricultural cooperative, an extension agent, or an agricultural credit outlet at this point in time, given other investment opportunities for scarce capital

This study also will be concerned with relating the resource base to problems of a region. If it is a low income region with many small farms and few alternatives for an immobile labor force and, if the natural resource potential has not been fully tapped, then some on-farm resources investments may be justified as a means of increasing income levels of extremely poor families. Similarly, if the natural resource base is being fully utilized, or over-utilized, the analytical process can serve to determine investments which should be made (e.g., labor intensive rural industry), or actions to be taken (e.g. resettlement) to prevent further deterioration of the natural resource base and the income level of the poor families in the area.

Natural resource information would not necessarily be used as the basis for screening for all types of rural infrastructure and services. As an example, educational services should be more people-oriented than place-oriented. An individual's educational background remains with him, wherever he may eventually decide to locate. Similar people-oriented analysis should be applied to other types of social infrastructure and services, such as health, so long as fixed investments are not extremely large for a region which may experience short-term high out-migration rates.

The following steps will be taken in carrying out this study:

- (1) Establish a land use classification system for the study area on the basis of analysis of information collected on soils, slopes, altitude, temperature, and rainfall (this data has been collected

by DIGESA, Unidad de Estudios y Proyectos, and has been completed for the 110 municipalities in Region I).

- (2) Integrate the agricultural resource data variables, identify and map uniform production areas by composite classes. Using planimeters, quantify and aggregate to the municipio level for each composite uniform production area class.
- (3) Prepare overlays of land classification data at appropriate scale (probably 1:50,000) for analytical purposes.
- (4) Utilizing a field survey and secondary information, indicate the present use of land classified above for each municipality and determine the highest potential use for which these lands are suitable (or would be suitable given modifications in the technologies employed which could be accomplished in the foreseeable future).
- (5) Code all this resource data to the municipio level and process data for computer analysis.
- (6) Gather, to the extent possible utilizing secondary data sources, other natural resource data such as mineral deposits, surface and subsurface water, and forest species, and collate with land classification data.
- (7) Analyze resource data and make initial screenings for on-farm resource improvement projects such as determining areas for improved cropping alternatives, small scale irrigation systems, and land terracing. Based on screened on-farm improvement potential and increased output potential therefrom, estimate number of families that can be gainfully employed with improved utilization of the agricultural resource base.
- (8) Analyze the off-farm infrastructure and services required to facilitate the changes needed by farm firms to increase the productivity of the land resources they command.

The outputs of the study will be:

- (1) Spatially defined inventory of natural resource base for

the study area. This will include the integration of agricultural resource data into a land use classification system, with spatial identification of uniform production areas by composite classes. Each composite uniform production area class will be quantified and aggregated at the municipio level.

Using other available data, present and potential crop production alternatives will be determined for all uniform production area classes at the municipio level. It also will include other natural resource data as available from secondary sources.

- (2) The inventoried natural resource data will be coded and computerized to the municipio level. Computer programs will be designed for retrieving the data according to spatially defined characteristics compatible with those of study one.
- (3) A series of maps and overlays of natural resource inventory data, which provide a visual presentation of the spatial distribution of (a) land by use classes, actual and potential crop production alternatives, and (b) other natural resources for which data are available. These will be prepared in a manner and in sizes compatible with maps and overlays of study one.
- (4) A manual will be prepared explaining the methods and procedures used in collecting and integrating the data and preparation of the computer classification system and retrieval programs, as well as of the maps and overlays. This manual will describe how to use and interpret the visual materials and computer system and illustrate types of applications that are possible.
- (5) A report will be prepared on an analysis of potential on-farm resource improvement projects as a result of the initial screening of the natural resource base, present production patterns, and the productive potential in each area. This report would estimate the magnitude of the area suitable for various resource improvement activities, an estimate of the increased output which could be expected, and of the number of families that might be gainfully employed with improved land resource utilization.

Finally, this report should include the recommended off-farm infrastructure and services to facilitate the required adjustments at the farm level.

(6) A final report will be prepared describing the data collected, the results of the analyses undertaken, and the possible applications of the available information in establishing investment needs and priorities.

c) Combining the Information Provided by the Two Studies and an Initial Screening of Investment Possibilities

The juxtaposition of the results of these two studies will provide the data base against which selected criteria can be applied to determine priorities between alternative investment opportunities, including preparation of short, medium and long-term plans at the local, regional and national levels.

The information forthcoming from the above studies will be combined, classified, and prepared in such a way that the analyst can utilize it to determine the suitability of an investment according to:

- i) The economic potential of the natural resource base at each investment site.
- ii) The need for specific types of infrastructure and services in each site.
- iii) The suitability of locating an investment at each site given the spatial relationship of that site to the surrounding localities.

To complete the planning cycle proposed by this project, [an initial screening of investment possibilities will be undertaken.] This initial screening will be the final phase in preparing an analytical methodology that can be broadly applied to the planning of programs to provide infrastructure and services in rural areas.

Although the details of the methodology are to be developed as a part of this project, the following comments will serve to illustrate the general structure of the methodology and process

which would be employed. The methodology will be structured in such a way as to allow the decision maker to systematically interact with a large amount of detailed data in order to answer the following types of questions:

1. Where are the locations where specific infrastructure items and services are currently needed?
2. Where is it feasible to undertake projects to provide specific infrastructure and services?
3. What is the expected impact of a specific infrastructure or service versus alternative choices?
4. Where are the locations where the expected impact of new infrastructure or services will be the greatest?

The process involved in employing the methodology could be as follows:

1. Where are the locations where specific infrastructure items and services are currently needed?
  - a. Decision-maker reviews maps to determine general areas where specific infrastructure and services are not available.
  - b. Decision-maker establishes criteria for determining whether a specific infrastructure item or service is required, based upon a judgment that such items are needed if an area possesses certain characteristics.
  - c. The available data is reviewed to determine how variables may be constructed which represent the characteristics the decision maker wishes to use to evaluate the needs for infrastructure or services.
  - d. The data collected by the two studies is sorted (manually or by computer) to determine those locations where an infrastructure or service item is absent and the variables representing the pre-selected characteristics suggest that it is

merited.

- e. A listing is made of the locations which are determined to be those needing a specific infrastructure or service item.
2. Where is it feasible to undertake projects to provide a specific infrastructure item?
    - a. The decision-maker decides under what conditions it would be feasible to provide certain infrastructure or services.
    - b. Available data is reviewed to determine how variables can be constructed which quantify the conditions established as limiting feasibility.
    - c. Each location established as needing the infrastructure or service is measured against the feasibility criteria established by the decision maker.
    - d. A listing is made of locations where it is feasible to undertake projects to provide the infrastructure item or services.
  3. What is the expected impact of type of new infrastructure or services versus alternative choices.
    - a. The decision-maker, based upon the best available judgment of the impact of each specific infrastructure item or service will have per "unit" (crop area, number of households, number of school children, etc.), assigns a value (either a cardinal measure such as economic return or an ordinal ranking based upon a social criterion), to be used in measuring expected impact of the alternatives to be compared.
    - b. The decision-maker establishes the parameters within which the alternatives will be compared, which might be a budget constraint, a limit on the number of projects, or a specific geographic area.
    - c. An economic return or an ordinal ranking is calculated based upon the number of "units" to be served times the assigned value.

- d. More sophisticated comparisons can be made by introducing the costs of providing the infrastructure or services for each alternative compared. If standard costs can be assigned per installation (costs for one school), or per unit (such as kilometers of road), first approximations of cost-benefit analysis could be achieved using the available data.
4. Where are the locations where the expected impact of new infrastructure or services will be greatest?
    - a. Again the decision-maker must assign the value to be used per "unit" as a measure of the impact of the project.
    - b. Locations are compared by calculating the value assigned per unit times the number of units as given by the data in each location.
    - c. A list ranking of alternative locations is generated.

As may be seen from the illustration of the process as described above, the methodology cannot be expected to reduce the participation of the decision-maker in decisions regarding what types of infrastructure and service programs should be undertaken. In fact, the process simply provides the decision-maker with the tools and data to approach such questions in a formal and systematic manner (Annex IV provides a specific illustration of how the methodology might be applied).

The outputs of this effort will be:

- a. The application of this methodology by one or more Guatemalan agencies, with the technical assistance of AID consultants, to a practical problem of choosing infrastructure or services interventions and their locations.

It should be added that USAID plans to use the data and analysis evolved in this Project as the basis for the Rural infrastructure Development Project proposed for FY 1980.

### Utilization of the Results of this Project

To the best of the Mission's knowledge, there are no similar AID projects from which an assessment can be made as to whether the results of this project will be utilized by the GOG. Nonetheless, AID's experience with agricultural sector analyses in various countries indicates that data which AID has helped to generate is, indeed, utilized by host country agencies. Given the scarcity of disaggregated data in Guatemala, there is every reason to expect that the data to be developed in the two proposed studies will be drawn upon by the GOG.

There are several indications that GOG agencies are anxious to have better data upon which to base programming decisions. The most notable is the work done by the Studies and Projects Unit (UEP) of DIGESA. Working on a limited budget they have classified the natural resource base for Region I (published), and have completed the field work for Region IV. They have also collected secondary data on crop production, population, and other social and economic variables for these regions. Based upon discussions with UEP, it is clear that the direction they are pursuing is toward a more formalized system of programming the agricultural development efforts. (As is noted in Section V, it is intended that UEP's efforts will become a part of this Project.)

INFORM's enthusiastic participation in the pilot field activities which lend to the development of this Project is an indication of their interest in developing a better data base and improved planning methodology. The recent data collection efforts on the part of INDE, related to the revision of the Rural Electrification Loan, indicate this institution's willingness to take advantage of more disaggregated data and formalize the process for making investment choices. Finally, INAFOR is presently undertaking ecological zone studies, based upon watershed units, in an attempt to provide themselves with improved information for program decision-making. These presently isolated efforts to obtain better data and develop better planning methodologies give us reason to believe that GOG agencies will take advantage of the data and methodology to be developed in this Project.

A major key to the future utilization of the results of this Project will be broad knowledge and understanding of it by GOG agencies. To this end a Steering Committee composed of

the representatives of various agencies will be created to assure that the data collected are relevant to their needs and to facilitate the utilization of the methodology at the completion of the Project. Their participation in the course of the Project will help them to understand what data are available and how to apply the methodology. Toward this end, a series of technical and management level workshops and seminars will be held throughout the project period in order to assure the widest possible understanding of the value and potential of the data and analytical base generated under the project in making investment choices for rural infrastructure and services. The Steering Committee will determine the scope, timing and audience orientation of these workshops and seminars.

D. PROJECT INPUTS

To assist the GOG in carrying out the two studies and achieve the intended outputs, AID will grant-finance technical assistance as follows:

	MM
(1) Resident Regional Planning and Analysis Advisor .....	15
(2) Senior Regional Analyst .....	2
(3) Economic Data Specialist .....	10
(4) Economic Geographer .....	3
(5) Computer Advisor .....	4
(6) Land Use Classification Advisor .....	2
(7) Agronomist .....	<u>3</u>
TOTAL .....	39

The expected cost of AID's technical assistance component is \$189,600.

AID will finance 200 technician months of local contracts to assure that high quality technicians are placed in key positions in the two studies. The approximate cost of these con-

tracts will be \$206,000. AID will fund salaries and per diem for survey interviewers, slightly over half of the expected computer costs (\$25,000), purchase two vehicles (\$11,000) for Study Two and rent five vehicles for the field survey contemplated in Study One (\$8,500), and provide limited funding for office equipment and materials. The total amount of AID financial input will be \$498,000.

The GOG's counterpart contribution will cover salaries of personnel (\$189,000), secretarial services, office equipment and supplies, vehicle operation and maintenance, office space, a computer time (\$20,000). GOG will also furnish vehicles for varied periods of time consistent with the field work requirements. The value of GOG's contribution has been established as equal to \$378,000.

Further details on the respective financial inputs are provided in the Financial Analysis Section found in Part IV.

#### IV. PROJECT ANALYSES

##### A. Technical Analysis

This project proposes to make considerable use of spatial analysis techniques based on central-place theory to describe the target area in terms of infrastructure, flows of goods and services and social activity. This will then be combined with an analysis of the economic potential for each of the same areas based on the capacity of the available natural resources in order to determine gaps in infrastructure and services which are constraints to the realization of the areas full economic potential.

In judging the project, from the technical stand-point, two basic questions were considered. One, is the spatial analysis technique appropriate? Two, is the proposed implementation methodology feasible?

##### 1. Appropriateness of Analytical Techniques

This question was considered to be two-point in nature. In the first instance, does central-place theory apply in the case of Guatemala and in the second, is it an appropriate planning tool for determining gaps and establishing priorities for infrastructure and services?

In recent years a considerable amount of interest has been generated within AID for the application of Central Place Theory to the development of rural areas. Central Place Theory has been developed to explain the geography of economic activity, much as micro-economic theory attempts to explain the economic behavior of the firm. Not unlike micro-economic theory it is a simplification of the real world situation, but it nonetheless helps us to understand why certain economic functions take place at particular locations.

The basis of the theory is relatively simple. From the consumer's point of view, the cost of a service is not only its price but the cost of transportation to obtain the goods. Therefore, goods that are frequently used and have a relatively low value (such as salt, matches) are found in close proximity to consumers. For higher value and less frequently used goods, consumers would be prepared to incur a larger transportation cost to obtain them. From the seller's point of view, it is economic to supply frequently used goods within an area with a relatively small population. For less frequently used goods, the supplier must draw upon a larger population in order to have an economic market. This gives rise to a distribution of population centers offering low value items which are dependent upon another population center offering higher value goods. According to the theory, these centers will be evenly distributed in the form of inter-connected hexagons. This model of hexagons assumes that the populations are distributed across a perfectly level and homogeneous land surface. The real world departs from the theory because a homogeneous level plain is almost never encountered. Instead, we find the spatial relationships between population centers offering lower value goods to those offering highest value goods influenced by mountains, rivers, and roads which influence the cost of transportation and the quality of the land resource which influences the density of the population.

The value of this theory, beyond helping us to understand the present economic relationships between population centers, is that it permits a projection to be made as to how these centers would develop with time and where new goods and services should be located to be consistent with the expected development of the area. Clearly not every population center will require a full set of goods and services. Provision of some goods and services will not be economic at the lowest order centers, yet populations over a broad geographic area might benefit if such goods and services were located at a related higher level population center. In some cases the introduction of a road or the improvement of a trail connecting a lower level population center to a higher level population center would be an economic means of providing the population with the goods and services which would contribute to their development.

Thus, the applicability of central place theory to rural Guatemala rests with our ability to determine where it is reasonable and economic to locate goods and services, and between what centers is it reasonable to improve the communications linkages given the normal flow of commerce.

A study done by Carol A. Smith consisting of a detailed analysis of the market system in the western highlands demonstrates that this technique can be used to describe at least two types of spatial economies in Guatemala permanent markets and periodic markets. The market system studied by Smith surrounds the major economic center for the region of western Guatemala: Quetzaltenango, a central place and the second largest city in the nation. Smith actually found two marketing systems, one essentially superimposed on the other. One was made up of permanent markets distributing goods manufactured outside of western Guatemala and controlled by the Ladino population. This system consisted of a ring of six sizeable Ladino market towns surrounding Quetzaltenango and 12 lesser Ladino Market towns peripheral to them. She also found an independent grid of periodic markets dealing primarily in Indian agricultural produce and consisting of 20 major bulking centers. She found that just as Quetzaltenango was central to the network of Ladino markets, a nearby major Indian market town, San Francisco El Alto, was central to the network of rural bulking centers. The appropriateness of spatial as a planning tool for determining needs and priorities for establishing infrastructure and services has been demonstrated in numerous cases through its practical application for this purpose in recent years. For Guatemala, the work done by Smith suggests that use of spatial analysis techniques may provide important insights as to which development strategies will and will not work.

## 2. Feasibility of Implementation of the Methodology

To confirm the feasibility of utilizing spatial analysis techniques involving the determination of the rural-urban hierarchy and the infrastructure and services available at each level, the methodology to be employed in the two studies was

applied to the Municipality of Comitancillo in the Department of San Marcos during project design. First, a questionnaire was developed and field-tested in municipalities in the Eastern area of the country. Based on this experience, modifications were made in the questionnaires and survey methodology and a second field test was made in the Altiplano Occidental. During this test, Comitancillo and three other municipalities were surveyed.

Based upon data obtained through the survey and from secondary sources, populated places in the Municipio of Comitancillo were ranked using the following criteria.

<u>Level of Center</u>	<u>Characteristics</u>	<u>Number</u>
"A" 1 (Dispersed Farming Community).	Dispersed population, no school, no local market day, no commercial establishments.	20
"A" 2 (Nucleated Farming Community)	Some nucleation of population, a primary school, some commercial establishment(s).	19
"B" (Rural Service Center)	Nucleated Population: 100 families or more; market day for the surrounding area; commercial establishment(s) offering variety of goods; a school (at least first three grades); accessible by vehicle, at least during dry season.	4
"C" (Market Town)	Market Facility serving one or more "B" centers; high level of retail activity and some wholesaling; year-round access by vehicle.	2

The relationships between the different levels of centers were plotted on a map and superimposed on a land-use classification map of the municipality. A third map, depicting the existing road network and inventory of infrastructure and services was then superimposed on the first two maps. A representative presentation of the three maps is shown as an Annex III. The number of land-use classification types was reduced from eight to four for ease of presentation.

An analysis of the resultant maps suggests the following possibilities for investment in additional infrastructure and services:

1. Construction of a farm-to-market road from Comitancillo toward the northwest to facilitate out-shipment of agricultural produce from an area with good land and a relatively high population.

2. Investigation of the desirability of upgrading the "Nucleated Farming Community" (A-2 Center) of Chicajalaj northwest of Comitancillo to a "Rural Service Center" (B Center) by introduction of potable water, construction of a periodic market facility, expansion of the existing primary school, and making credit available for an increase in the number of commercial establishments.

3. Provision of agricultural extension and credit services by the GOG or a cooperative organization in the relatively good agricultural areas surrounding Tuimuj and to the Northwest of Comitancillo.

4. Investigation of the feasibility of introducing potable water in "B" level "Rural Services Centers", Santa Teresa and Tiuchilupe.

It should be noted that the definition of the rural/urban hierarchy was done for the municipal area of Comitancillo only and that similar analysis and mapping of the surrounding municipalities will probably result in a redefinition of the association of the various levels of the hierarchy.

Nevertheless, the techniques proved workable and will be used as the basis for the development of the planning methodology described in Section III, Project Description.

The planning methodology described above represents an entirely new approach to establishment of priorities and resource allocation by the GOG. While the methodology is not particularly complicated, great care will have to be taken to assure that the studies are carried out in such a way that the pieces will all fit together at the end. There is a real danger, which will have to be constantly borne in mind, that the data could overwhelm the data users. Since the approach is new for Guatemala, and since it is essential that the conduct of the studies be technically correct, a large component of external technical assistance has been programmed into the project.

A resident regional planning and analysis advisor will be USAID's overall coordinator for the studies. This advisor will be responsible for assisting the implementing agencies in all aspects of the conduct of the studies, including selection of the professional staff to be contracted under the grant scheduling of short-term TDY assistance, selection of analytical techniques, questionnaire design and survey procedures, data aggregation and processing, mapping procedures, scope and content of draft and final reports.

A senior regional analyst will be the principal technical backstop specialist for the project and will make several trips to Guatemala during the course of the project to provide guidance to the U.S. and GOG staffs. The analyst's participation will be most important at the following points in project implementation:

- Design and field testing of pilot survey questionnaire.
- Aggregation, mapping and analysis of pilot survey results.
- Seminar on results of pilot survey.

- Refinement and field testing of full-scale survey questionnaire.
- Aggregation, mapping and analysis of survey results.
- Preparation of final reports.

An Economic Data Specialist will serve as the principal assistant to the resident regional planning and analysis advisor. [The specialist will work in all aspects of the studies but will concentrate on the design and field testing of the survey procedures, training of survey crews, logistics for conduct of the surveys, and procedures for tabulation, processing and analysis of survey data.]

[An economic geographer will advise on preparation of the preliminary map definition of the rural/urban hierarchy, survey questionnaire design, tabulation, processing and mapping of: survey data, mapping techniques for the land use classification and crop alternatives studies, and procedures for consolidated mapping of the results of the two studies.]

A computer advisor will advise on survey questionnaire design, tabulation and processing of survey results, programs, required for storage and recall of the data generated in the inventory of infrastructure and services, as well as in the land-use classification and crop alternative studies.

A land-use classification specialist and an agronomist will review the land-use classification mapping done to date by the Unit of Project and Studies in the Ministry of Agriculture and provide advice on modifications as may be required. These specialists also will participate in the design and conduct of the training program for the land use classification and cropping alternative studies. They will return to Guatemala at 3 to 4 month intervals during the execution of both studies to review work, suggest modifications, as required, and participate in the design and preparation of final reports.

(See Section III-D for additional information about technical assistance inputs).

## B. FINANCIAL ANALYSIS AND PLAN

The total estimated cost of this project is \$875,200 of which \$497,500 (57%) will be financed by AID, and \$377,700 (43%) by the Government of Guatemala.

The primary implementing agencies of the project will be the Instituto de Fomento Municipal (INFOM), the Unidad Sectorial de Planificación Agrícola (USPA) and the Unidad de Estudios y Proyectos (UEP) of the Dirección General de Servicios Agrícolas (DIGESA).

Part V of this paper contains a brief assessment of each of these units. This assessment indicates that they have, or will have, the capacity to successfully carry out their respective parts of the studies. The cost effectiveness for conducting the studies envisioned by this project appears reasonable; especially when compared with the cost of obtaining the information by other means. By using the facilities already in place at INFOM and DIGESA and strengthening or supplementing them when necessary, the required information will be obtained at when we believe to be the most favorable price available to the Mission. Additionally, by participating in this project both INFOM and DIGESA will have developed an in-house capability to conduct similar future studies and surveys and will have learned the value of such studies.

The tables included in this section of the Project Paper illustrate the financial aspects of the Project table I, Summary Cost Estimates and Financial Plan, for the project, reflects both AID and GOG inputs identified according to use. AID financing will be in the form of a grant to be disbursed through agreements with the Ministry of Agriculture and INFOM. These funds will be used to finance technical assistance (38%), local staffing (41%), equipment and materials (4%), computer services (5%), vehicles (2%) and various other costs (9%). GOG contributions will finance local staffing (50%), equipment and materials (9%), computer services (5%), and other costs (35%).

Table II Project Expenditures and Financial Plan, is a time-phased presentation of project expenditures which shows that 52% of project expenditures will occur during the first year. This is due primarily to start-up activities and their related costs which occur early in the implementation period.

Table III represents project costs allocated to each of the major studies by source of funding. Unit inputs have been allocated to each study so that output costs can be controlled and evaluated during project implementation. Costs of the first study is estimated at \$432,100 of which AID will finance \$343,500 or 79%. The second study is estimated to cost \$431,100 with AID financing \$154,000 or 36%. AID's inputs into Study No. 1 are larger because technical assistance requirements are greater. In Study No. 2, GOG's inputs increase considerably because of the local staffing requirements.

TABLE I

INTEGRATED AREA STUDIES

Summary Cost Estimate and Financial Plan

(US\$ 000)

<u>DESCRIPTION (USE)</u>	<u>AID</u>	<u>GOG</u>	<u>TOTALS</u>
External Technical Assistance	\$ 189.6	\$ ----.-	\$ 189.6
Local Staff	206.0	189.0	395.0
Vehicle Purchases	11.0	----.-	11.0
Equipment & Materials	19.0	35.0	54.0
Computer Time	25.0	20.0	45.0
Other Costs	46.9	133.7	180.6
<b>Totals.</b>	<b>\$ 497.5</b>	<b>\$ 377.7</b>	<b>\$ 875.2</b>

## INTEGRATED AREA STUDIES

Project Expenditures and Financial Plan  
(US\$ 000)

<u>AID GRANT FUNDS:</u>	<u>1978</u>	<u>1979</u>	<u>Total</u>
<b>External Technical Assistance:</b>			
Resident Planning Advisor	\$ 17.1	\$ 25.5	\$ 42.6
Senior Regional Analyst	4.8	4.8	9.6
Economic Data Specialist	15.4	15.3	30.7
Economic Geographer	6.2	6.2	12.4
Computer Advisor	3.7	11.1	14.8
Land Use Classification Advisor	6.1	2.0	8.1
Agronomist	6.1	6.1	12.2
Other Costs	<u>23.7</u>	<u>35.5</u>	<u>59.2</u>
Total External Tech. Assist.	\$ 83.1	\$106.5	\$189.6
Local Staff	116.7	89.3	206.0
Equipment and Materials	15.0	4.0	19.0
Vehicle Purchase	11.0	00.0	11.0
Computer Time	5.0	20.0	25.0
Other Costs	<u>31.3</u>	<u>15.6</u>	<u>46.9</u>
Total AID Funding	<u>\$262.1</u>	<u>\$235.4</u>	<u>\$497.5</u>
<u>GOG COUNTERPART</u>			
Local Staff	92.5	96.5	189.0
Equipment & Materials	19.5	15.5	35.0
Computer Time	10.0	10.0	20.0
Other Costs	<u>71.0</u>	<u>62.7</u>	<u>133.7</u>
Total GOG Funding	<u>\$193.0</u>	<u>\$184.7</u>	<u>\$377.7</u>
Total PROJECT	<u>\$455.1</u>	<u>\$420.1</u>	<u>\$875.2</u>

I N T E G R A T E D   A R E A   S T U D I E S

TABLE III

Project Costs Allocated to Outputs by  
Source of Funding

(US\$ 000)

DESCRIPTION (USE)	STUDY No. I   1/			STUDY No. II   2/			PROJECT TOTALS		
	AID	GOG	TOTAL	AID	GOG	TOTAL	AID	GOG	TOTAL
External Technical Assistance	\$150.0	\$ --	\$150.0	\$ 39.6	\$ --	\$ 39.6	\$189.6	\$ --	\$189.6
Local Staff	138.4	26.4	164.8	67.6	162.6	218.2	206.0	189.0	383.0
Vehicle Purchases	--	--	--	11.0	--	11.0	11.0	--	11.0
Equipment and Materials	--	16.0	16.0	19.0	19.0	38.0	19.0	35.0	54.0
Computer Time	25.0	--	25.0	--	20.0	20.0	25.0	20.0	45.0
Other Costs:									
Secretarial Services & Office Space	--	8.0	8.0	--	38.5	38.5	--	46.5	46.5
Per Diem	21.6	7.5	29.1	16.8	--	16.8	38.4	7.5	45.9
Vehicle Rental/Use	8.5	24.5	33.0	--	38.0	38.0	8.5	62.5	71.0
Vehicle Operation & Maint.	--	6.2	6.2	--	11.0	11.0	--	17.2	17.2
<b>Total Other Costs</b>	<b>\$ 30.1</b>	<b>\$ 46.2</b>	<b>\$ 76.3</b>	<b>\$ 16.8</b>	<b>\$ 87.5</b>	<b>\$104.3</b>	<b>\$ 46.9</b>	<b>\$133.7</b>	<b>\$180.6</b>
<b>TOTALS</b>	<b>\$343.5</b>	<b>\$ 88.6</b>	<b>\$432.1</b>	<b>\$154.0</b>	<b>\$289.1</b>	<b>\$431.1</b>	<b>\$497.5</b>	<b>\$377.7</b>	<b>\$875.2</b>

1/ Study No. I will yield definition of Rural/Urban Hierarchy and Inventory of Infraestructura and Services.

2/ Study No. II will yield information for Natural Resource and Related Data Requirements.

PART IV. C. SOCIAL ANALYSIS

The knowledge base about rural Guatemala may be somewhat unique among less developed countries in that considerable information is available concerning the socio-cultural characteristics of the rural populations throughout the country. This information provides great assistance in delineating the socio-cultural parameters imposed by traditional Indian cultures on economic development efforts in the Highlands areas. It also points out the difference between these traditional cultures and the primarily Ladino Societies of the Eastern regions, as well as the characteristics of the socio-economic inter-actions between Indian and Ladino cultures within the target areas.

Relative to this socio-cultural knowledge base, what is lacking is an extensive and integrated knowledge of 1) economic potential in terms of the resource base that exists in the rural areas, and 2) the extent and location of both economic and social rural infrastructure and services in relation to economic potential.

The studies proposed under this project are focused primarily on rural population groupings below the Cabeceras Municipales (but includes small rural-type cabeceras). This is where the majority of the poorest families (including the Indian population) live. The results of the studies can be expected to contribute to making investment decisions that will generate economic opportunities for these poorer segments of the population, as well as improve the ability of the public sector to select locations for social infrastructure and services such that they will promote the well-being of the target groups.

These studies will contribute significantly to the definition of the structural and spatial organization of the rural development process in the target areas. This knowledge combined with knowledge of the location and mix of the various target sub-groups, will permit improved targeting of both infrastructure and directly productive investments. These improvements will occur not only in terms of type of investment selected, but also in terms of selection of sites for such investments, resulting in a larger share of investment benefits accruing to those selected sub-groups whose need is greatest.

PART IV. D. ECONOMIC ANALYSIS

A serious deficiency in the design and implementation of development projects directed toward the rural poor in Guatemala is the lack of reliable data upon which to base their design. Although estimates may be available at aggregate levels (Departments, regions, national) for various types of information, it is seldom available for smaller areas, such as municipalities or individual towns and villages and their respective areas of influence.

In terms of economic analysis, rural development activities can be classified into two groups; 1) Those which attempt to impact directly on production by channelling a resource (as credit, technical assistance, etc.) to particular farmers (including development of the institutions whose purpose is to deliver these resources to farmers), and 2) those which attempt to alleviate constraints which are external to the farms themselves but inhibit the development of enterprises within the geographic area influenced by such constraints.

The economic analysis required in the design and implementation of activities of the former category should be based upon fairly precise enterprise profiles for reasonably homogeneous sub-groups of firms in order to direct programs to the unique needs of each sub-group. Information about inputs, expenses, outputs and incomes is required for various subgroups of farms and rural enterprises considered within the target group. USAID presently is assisting the GOG in development and implementation of the area sample frame as an appropriate method for generating accurate and timely data about such firms.

Design and implementation of activities in the latter category requires analysis which identifies those actions needed to create conditions which will facilitate expanded economic activity, and consequently achieve the necessary multiplier effects in the local economy to increase incomes and generate employment. These activities seek to alleviate constraints common to most of the target sub-groups in the area and thereby

establish the environment which not only permits, but provides incentives for making those firm-level decisions that contribute to increased productivity, income, and employment within target sub-groups. For this type of program, the needed analytical profile is not of the individual target sub-groups, but the targeted spatial and structural environment (i.e., the target setting) under which the various target sub-groups operate. The studies to be carried out under this project are designed to satisfy the data and analytical requirements for this latter category of development programs. In this sense, this project serves as the mechanism for acquiring critical inputs (economic data and analysis) for addressing and important set of development investment activities.

In the intensive review of this project, USAID examined current practices of the GOG and international agencies in Guatemala for setting investment priorities for rural infrastructure projects. This examination revealed that most GOG implementing agencies involved in infrastructure investments are engaged largely in a programming process. That is to say that investment budgets are typically drawn from portfolio of unfinanced projects on the basis of subjective criteria resulting from external and internal pressures such as: (1) demands from towns and villages for services, (2) political pressures for action in certain regions, and (3) demands from field staff for action in certain areas or on specific projects. Long or medium term planning by specific areas is seldom practiced by implementing agencies, and formal coordination between agencies to establish long-run area-specific goals is virtually non-existent.

It appears that the availability of investment funds to an agency may not be the most serious bottleneck. Many agencies appear to have trouble expending the full amount of the funds allotted to them each year. One of the critical bottlenecks is a lack of current data on infrastructure and natural resources, and a system for analyzing such data in a systematic and meaningful manner. Available data is out-of-date, is not site-specific, and information about one kind of infrastructure cannot be related spatially to information about another, or if it is available to one agency it is not shared across agencies.

This project has as its purpose the generation of uniform infrastructure resource data in a spatially organized manner. The USAID has concluded that the procedure proposed in the project is the most cost-effective means of achieving the desired purpose. The alternative would be to seek to improve the abilities of the various agencies involved in infrastructure development to generate and analyze their own data. Such an alternative has the distinct disadvantage of requiring upgrading of data gathering and analysis expertise in a large number of agencies, many of which are in need of similar types of infrastructure and resource information and analysis. Neither would such an approach resolve the problem of making data available across agencies in order that investment decisions made by one agency for a given geographic area would be complementary to the decisions of other agencies providing other types of investments. Thus, it would be difficult to 1) avoid significant gaps and duplications in data gathering, 2) assure uniformity in the quality and coverage of data obtained, 3) assure full availability of data across agency lines and 4) avoid duplication in the analysis of such data. These factors all tend to decrease efficiency, increase costs, and reduce quality of the data gathering and analysis process.

The alternative is for one or a few key institutions jointly to assume the leadership for carrying out the basic data collection and analysis process, and make the results available to all parties interested in its use. That is considered to be the most cost-effective alternative under Guatemalan circumstances and is the alternative adopted for this project.

V. IMPLEMENTATION PLAN

A. Administrative Arrangements

The key implementing units for the project will be the Instituto de Fomento Municipal (INFOM), Unidad Sectorial de Planificación Agrícola (USPA) and the Unidad de Estudios y Proyectos (UEP) of the Dirección General de Servicios Agrícolas (DIGESA). A brief assessment of each unit's institutional capacity to carry out these studies shows a high degree of complementarity between their functions. INFOM will undertake the primary responsibility for carrying out the survey, mapping and classification of infrastructure and services for Study One (the definition of the rural/urban hierarchy). USPA will assist INFOM in the implementation of the infra-structure and services study, and a combination of USPA capabilities and those of the UEP will be utilized for implementing Study Two to determine the economic potential of each level of the rural/urban hierarchy.

In addition to the agencies implementing the two studies, a Steering Committee will be created to oversee the development of the project. The Steering Committee will be composed of selected representatives of various agencies expected to be users of the data and methodology developed by the project. This Steering Committee will be chaired by the National Planning Office (CNPA) and will consist of seven members selected from the following agencies:

1. INFOM (Municipal Development)\*
2. USPA (Min. Agr. Planning Office)\*
3. Caminos de Acceso (Min. of Public Works -responsible for rural roads).
4. INDE: Planning Unit (rural electrification)
5. DIGESA (Min. Agr.: Agr. Extension, Natural Resources, Studies and Project Unit).
6. SALUD PUBLICA (Min. Salud -rural health posts).

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\* These institutions must be members of the committee.

7. Educación Básica Rural (Min. Ed. -rural schools).
8. BANDESA (Agr. Credit).
9. INAFOR (Forestry).
10. INDECA (Agr. Marketing).
11. GUATEL (Telephone and telegrams).
12. INTA (Land Reform).

The Steering Committee will have the following responsibilities:

1. Monitor the progress of the project.
2. Review the data to be collected to see that it is relevant to their expected needs.
3. Facilitate the gathering of secondary data which is already available within their institutions.
4. Organization and scheduling of seminars and workshops to explain the theory underlying the studies and the planning methodology to be developed.
5. Review the methodology proposed to assure its applicability to their planning needs.
6. Serve as a communication link with their institution regarding the type of data being generated and the possible applications for the methodology to be developed by the project.
7. Facilitate the application of the methodology to planning programs of infrastructure and services in the rural areas.

The strategy of the Steering Committee is that it will be helpful in the implementation of the project, but more importantly it will be a means of motivating the various institutions to implement the planning methodology at the termination of the project.

1. INFOM, USPA and Implementation Arrangements for Study One

INFOM was selected as the most appropriate implementing agency for this study since it is the Government agency most directly involved with planning and implementing municipal infrastructure projects. It also has experience in administering surveys primarily at the cabecera level of the local government. Furthermore, INFOM is the most likely agency to take the leading role in implementing future rural infrastructure projects. In addition, INFOM's previous participation in the implementation of AID finance projects has shown them to be extremely capable.

During intensive review, estimates of the availability of manpower, vehicles and computing facilities for an infrastructure survey were obtained from INFOM.

In regard to manpower, the Municipal Training and Research Section has a staff of 25: seven economists; six accountants, five business administration specialists, one public service engineer; one lawyer, one legal aide, and four social workers. This section has ample field experience, working with municipal authorities and questionnaire data. Not only would they be able to provide expertise in preparing a questionnaire but also in training enumerators. Further, their municipal training programs contributed to development of a good rapport between INFOM and the municipalities. Other personnel mentioned by INFOM as potentially available for an infrastructure survey were: forty to fifty engineering supervisors and auxiliary engineering supervisors; five financial analysts; and five social promoters. However, the Chief of Planning indicated that reliance on INFOM resources only would make an infrastructure survey of places below the cabecera level a very slow process. Supervision of local contractors by INFOM was suggested as the best approach.

Vehicles for the supervisory staff will be another resource required to conduct the survey. INFOM travels often and extensively

in their training program and trip planning could make some vehicles available for dual purposes, training and surveying, at least on an occasional basis. However, INFOM currently has a vehicle shortage; purchase of 15 vehicles under a BID program is temporarily blocked and 10 of these vehicles are to replace vehicles already turned in. Given the vehicle situation, INFOM could furnish three vehicles for the survey, but acquisition of additional vehicles will be necessary. AID will finance the rental of remaining vehicles required for the short period of time for field work required by the Survey.

Computer facilities and office space also will be required for Study One. INFOM can fill the needs for office space, but INFOM's computer facilities are not adequate for the needs of the proposed studies. Although the exact size of memory required for calculations related to the studies will be a function of the number of variables and size of matrices manipulated, a rough estimate is 160K. INFOM has an IBM 32 computer, with 9 million bytes of storage and 16K core (sufficient memory for commercial and accounting applications.) Also, the compiler of the INFOM system does not handle COBOL or FORTRAN. Compilers with these functions could be added, but the memory of their unit is too small for study purposes.

However, the INFOM terminal could be linked with the Minister of Finance computer. The Ministry of Finance computer center has a 360-135 KBM computer with a compiler to handle FORTRAN IV, the most common scientific language and COBOL. FORTRAN based program systems, SPSS and Binary SPSS G are available. The Center has facilities for cassette reading, disc driver, and tape driver. INFOM currently maintains good working relationships with the Ministry of Finance (obtaining computer services by furnishing supplies). Given the possibility of collaboration between USPA, AID and INFOM on a project, an arrangement to use the Ministry of Finance's computing facilities should be possible.

USPA is directly under the Minister of Agriculture and is responsible for assisting him in the planning, programming and coordination of all public agriculture sector activities. It is charged with the following functions: (a) gather, process and analyze data required for policy formulation;

(b) program and budget resources in accordance with established priorities; (c) assist the Minister in coordination of all sector programs; and (d) evaluate sector activities in a systematic fashion to provide guidance for future planning and programming 1/. Currently due to a GOG freeze of hiring, USPA lacks staff to perform some of these functions; however, USPA does offer some strengths for supporting both the infrastructure survey, and the study to determine resource use potential. Particularly through AID financed technicians, USPA could provide some assistance in development of questionnaires, development of training materials for supervisors and enumerators, specification of methodologies, and tabulation of data. The project would be welcomed by USPA as an excellent opportunity to give list-frame technicians and future area frame enumerators valuable experience in design, management, collection, and tabulation of data. Participation in the project would also assist USPA in its work towards development of data bank.

In view of the above, it is anticipated that final implementation arrangements for Study One will closely resemble the following:

The Study will be carried out by INFOM, assisted by USPA, with periodic briefings and contacts with other GOG agencies such as the National Planning Council, the Department of Roads, and ministries of Agriculture, Health and Education. The collaboration of these agencies will greatly facilitate the gathering of information on existing infrastructure and services.

To carry out the study, INFOM will organize a working group composed of a project director, two regional analysts, four regional analysis assistants, one computer programmer, two part-time key punch operators, and three part-time draftsmen.

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1/ AID is currently grant funding technical assistance and has loan funds programmed to assist this unit to carry out these functions.

The pilot survey staff will consist of a survey supervisor and assistant and eight data collection supervisors. This basic crew will be augmented by 24 permanent data collectors and 48 temporary data collectors during the full survey which is scheduled for 12 weeks during the October 1978-January 1979 period. The study staff, with the exception of the data collectors and their supervisors, will be full or part-time employees of INFOM. The temporary data collectors will be recruited from rural teachers and education supervisors, who are familiar with conditions in their areas and include many who speak at least one of the indigenous languages.

In addition to the above staffing, AID and GOG counterpart funds will be used to provide technical assistance (which is described in Section IV, A., 2) office space and equipment, secretarial services, transportation, per diem, computer time, maps and office supplies. It is expected that arrangements for computer time will be made through the Ministry of Finance.

## 2. UEP and Implementation Arrangements for Study Two

The UEP, with a staff of 150 people, is collecting and organizing data for use in planning within the Public Agricultural Sector. Diagnostic studies are planned for each of the DIGESA regions. The UEP has completed the first of these in Region I and has done the field work for the second in Region V.

The diagnostic study for Region I consists of five volumes: I, a Resumé; II, Natural Resources; III, Social/Economic Data; IV, Crop Animal and Agricultural Industrial Production; and V, Priorities and Selection of Micro-areas in Region I. All volumes now have been completed.

Region I includes 30 of 31 municipios in Huehuetenango, 19 of 24 municipios in Quetzaltenango, 18 of 29 municipios in San Marcos, all of Sololá, all of Totonicapán and 14 of 18 municipios in Quiché. All of these lie within the project study area.

Infrastructure related to agricultural development is included. Much of the data was obtained from other agencies, e.g. INDE, GUATEL, Caminos, Education and Health.

Natural Resources information includes temperature, rainfall, water and soils. Water resource information was collected from INDE, and through field work to locate places with irrigation potential. Soils information was gathered during field work scheduled for that purpose although a distinction was not made between soils reconnaissance and soils mapping during conversations with UEP personnel. Soils information in the form of land capability Classes through VIII is recorded on maps at a scale of 1:50,000.

Agricultural production data is based on Dirección General de Estadística surveys refined by observations of DIGESA technical and credit agents. (Each year Estadística surveys a third of municipalities to estimate agricultural production). Copies of DIGESA agents' reports (records are kept on each farmer) contribute to production estimates.

Estimates of actual land use were obtained by adjusting the 1964 census of agriculture through conversations with agriculture promoters and alcaldes.

Some socio-economic data was obtained through a small sample of households in Region I. Method of sample selection is unknown.

It is believed that some of the information on natural resources, particularly land classification, put together by the UEP for the diagnostic study will be adequate for use in the economic potential study under this project. The Mission will acquire technical expertise to verify this assumption. If the data is determined to be adequate, then much of the work in this area will already have been completed.

It is anticipated that final implementation arrangements for Study Two will be as follows:

The study will be jointly implemented by the UEP and USPA with periodic briefing and consultation of the National Planning Council. The UEP will complete the natural resources inventory (diagnostic study) for the 157 municipality study area. USPA will take responsibility for carrying out the crop alternatives studies, combining all data, and performing the analysis to determine the economic potential of the various levels of the rural/urban hierarchy.

Field investigations for the crop alternatives studies will be carried out by four teams composed of two experienced agronomists in each team. These teams will spend approximately one person a week in each municipality verifying the land use maps prepared by UEP, examining existing cropping patterns and assessing potential cropping alternatives by land classification type. The information will be checked by the working group staff in Guatemala City and processed by USPA for storage in computerized data files. The land use maps will be adjusted as necessary and economic potential studies will be prepared for each municipality.

Personnel will be detailed by the UEP and USPA for implementation of the study and will be augmented by contract services funded under the project. Grant and Counterpart funds also will be utilized to finance transportation, per diem, computer time, office equipment and supplies and other support services.

### 3. Updating and Continuation of the Data Base

INFOM will be assigned the responsibility for maintaining a library of the maps, reports, data code books, and computer use manuals. They will be responsible for keeping these materials in good order and making them available to user agencies. INFOM personnel, familiar with the data collected will be assigned to the library and be responsible for assisting other agencies in accessing the computerized file.

The rationale for selecting INFOM to be responsible for the continuation of the data base and methodology is as follows:

1. INFOM is one of the major entities involved in developing the data, and will thus have personnel who are knowledgeable about the collection and storage of the data.
2. Given their responsibility for municipal infrastructure development, they are expected to be one of the most important users of the data and methodology.
3. Since much of the data to be updated will be data on infrastructure at the municipal level (natural resource data will not change from year to year), they will have the major responsibility, and sources of local level data, for updating the data files.

The computerized data will be counted on the computer in such a form that each municipality is coded and each data item has an assigned location. To access the computer, a technician will need to indicate the codes for the municipalities which he wants to consider, the location of data which is of interest, and the program to be applied. Likewise, to update the data, the new data is simply entered into the location assigned replacing the old data. Additional data can be added to the file by coding it to codes representing the municipalities. INFOM will be responsible for updating and expanding the computerized data file.

Periodically, INFOM will print out the data corresponding to a particular area (i.e., electrical connections or roads) and ask the respective institutions to update the record based upon their sources of information. Likewise, as the institutions utilize the data file, they may at that time bring the portion for which they have new data up to date. INFOM will be responsible for the mechanics of this updating.

#### B. Implementation Schedule

This section presents plans and schedules from project approval through completion of the project. An accompanying chart illustrates the time-phased implementation plan for duration of the project.

Completion of the Project Paper early in the second quarter of Calendar Year 1978 should provide time to receive project approval and sign a Project Agreement with the GOG by the end of the second quarter of 1978.

Since the project was selected as possible Title XII activity, the Mission provided AID/W with a scope of work for technical assistance early in the first quarter of calendar year 1978. Recommendations for Title XII institutions that might become involved has been received by the Mission, and expressions of interest are being sought from these institutions. Expressions of interest were requested by early second quarter so that contractor selection and contract negotiation can be completed early in the third quarter and the resident advisor would arrive during the third quarter.

Beginning with the third quarter of CY 1978, the project implementation will proceed as follows:

##### 1) Third Quarter - CY 1978

###### a. Study One:

- i) INFOM will begin collecting secondary data on infrastructure and services available in each locality.

- ii) INFOM will form an analysis Group and begin preparation of a questionnaire to obtain field level data on infrastructure and services, and hierarchical linkages between towns, villages, and rural settlements.

These activities will be initiated with assistance of AID direct-hire staff, USPA technical advisors, and TDY assistance, even though the resident advisor will not yet have arrived, in order to ensure that the tight scheduling required to do field survey work in November is accomplished. This is necessary since school teachers are expected to be a major source of interviewers and this is the period in which they could be available.

The Resident Advisor will arrive to assist with the following activities in both studies.

Study One:

- i. Field testing of the Questionnaire, training of the pilot survey crew, and conducting of the pilot survey (15 to 20 municipalities) should be completed in this period.
- ii. Based upon preliminary data from the Pilot Survey, the Survey Team and advisors will map and analyze the data and refine the survey methodology.
- iii. A "State of the Art " paper will be prepared to introduce officials of the participating and collaborating institutions to the theory behind the methodology to be

employed.

- iv. Design and pre-testing of the final questionnaire will be initiated.

c. Study Two:

- i. A training program will be conducted for personnel responsible for collecting and mapping secondary natural resource data.
- ii. Collection and mapping of natural resource data will be initiated.

d. Methodology:

Work will begin on preparing the planning methodology.

2. Fourth Quarter - CY 1978

a. Study One:

- i. Final questionnaire to be completed.
- ii. The survey teams will be selected and trained.
- iii. The survey will be initiated in the field in early November to take advantage of the period when teachers can be utilized as interviewers.
- iv. A seminar will be conducted with officials of various potential user agencies based upon the "State of the Art" paper and pilot survey results.

b. Study Two:

- i. Field teams to assess actual and potential resource use will be trained.
- ii. Field work of these teams will begin at the same time as the survey work in Study One.

3. First Quarter - CY 1979

a. Study One:

- i. The field work on the survey will be completed.
- ii. Processing, organizing, and mapping on the survey data will be initiated.

b. Study Two:

Field work to assess actual and potential use of resources and mapping of resources continues during this period.

c. Methodology:

Work will begin on combining the data from the two studies.

4. Second Quarter - CY 1979

a. Study One:

Data processing and mapping will be completed during this period.

Analysis of the data will begin for municipalities completed.

b. Study Two:

Field work will be completed and reports by municipality prepared.

5. Third Quarter - CY 1979

a. Study One:

- i. Formal analysis of the data detailing linkages between the elements of the urban/rural hierarchy and existence (or lack) of infrastructure and services will be completed.
- ii. A seminar for officials of potential user agencies will be held to inform them of the type of data available and the use that can be made of these data.

b. Study Two:

- i. The natural resource data will be screened to determine the on-farm resource improvements (i.e. irrigation conservation, alternative cropping programs) that appear to be applicable to the areas studied.
- ii. Analysis of the data for purpose of preparing recommendations of the types of infrastructure and services required to fully utilize the resource potential will be completed.

c. Methodology

During this period, initial screening of investment possibilities will be undertaken to demonstrate the use of the data and the planning process based upon this data. [A seminar will be held with officials of potential user agencies to introduce them to incorporate the results of this process into their operating procedures.]

C. EVALUATION PLAN

Evaluation of the Project at the output level will take place during project implementation and immediately upon completion. The measurement of outputs will be based upon

progress made in implementing the two studies and the quality and completeness of the data, and the results obtained. This will be accomplished through maintaining implementation and periodic reviews (every 3-4 months) carried out jointly by the implementing agencies, technical advisors and USAID/Guatemala.

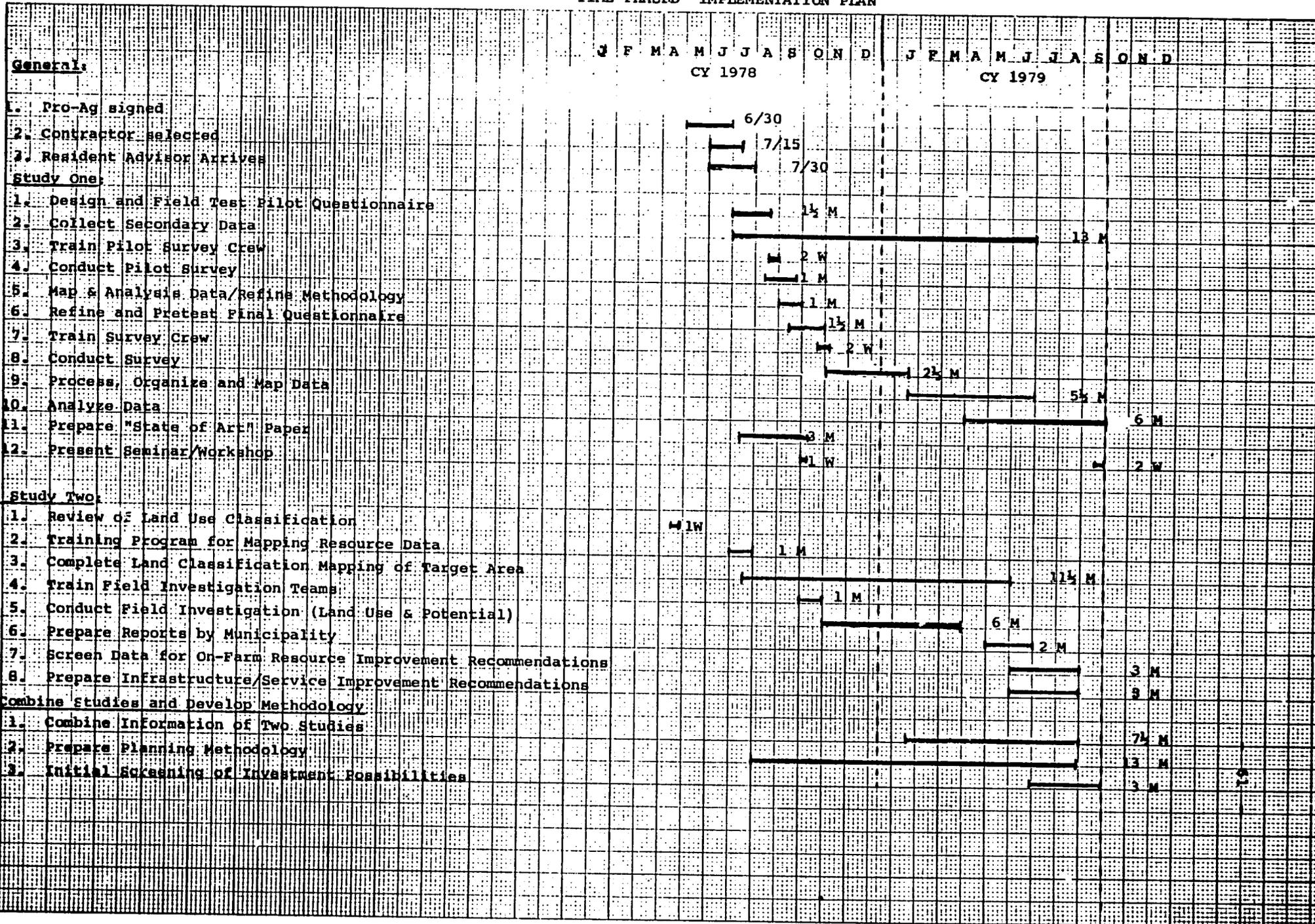
Evaluation at the purpose level will be made at approximately 6 months intervals for one year after project completion. These evaluations will determine the extent to which the information and the results of the analysis produced by the study have been incorporated into a new planning methodology of the nature outlined in the project description. Reviews of planning and resource allocation procedures being employed will be made by the Mission, with TDY assistance for this purpose. Also, the process of developing future projects for AID financing will provide further opportunities to evaluate the success of the project as related to purpose.

The desired effect at the goal level will come about indirectly after the outputs of this project are utilized to plan new infrastructure and services projects and then subsequent implementation. Therefore, any meaningful objective evaluation of this project in terms of goal achievement will have to be done concurrent with that of future projects.

A N N E X E S

- ANNEX I - MAP OF AID TARGET AREA
- ANNEX II - ENVIROMENTAL IMPACT STATEMENT
- ANNEX III - MAPS ILLUSTRATING THE TYPE OF INFORMATION  
TO BE DERIVED FROM STUDY ONE AND TWO
- ANNEX IV - ILLUSTRATION OF AN APPLICATION OF THE DATA  
AND METHODOLOGY

TIME-PHASED IMPLEMENTATION PLAN



PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Project Title & Number: **Integrated Area Studies**

INSTRUCTIONS: THIS IS AN OPTIONAL  
FORM AND SHOULD BE USED ONLY IN  
TO OBTAINING DATA FOR THE PER  
REPORT. IT NEED NOT BE RETAINED  
OR SUBMITTED.

Life of Project  
From FY 78 to FY 79  
Total U.S. Funds \$498,000  
Date Prepared: 3/21/78

PAGE 1

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes:</p> <p><b>1. Increase small farmer incomes and improve well-being in rural areas.</b></p>	<p>Measures of Goal Achievement:</p> <p><b>1. Increase in incomes of small farmer target group.</b></p> <p><b>2. Availability of needed services at specific locations.</b></p>	<p><b>1. Baseline and periodic sample survey of target group.</b></p> <p><b>2. Updating of infrastructure and services inventory developed in this project.</b></p>	<p>Assumptions for achieving goal targets:</p> <p><b>1. GOG and non-Governmental agencies have or can attract sufficient financial and managerial capability to develop and implement projects which will fill the identified gaps in infrastructure and services.</b></p> <p><b>2. Maximum economic potential not presently being realized, i.e., natural and human resources are under or inefficiently employed in target areas.</b></p> <p><b>3. GOG will continue to invest in programs which stress equity as well as productivity.</b></p>

PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project: \_\_\_\_\_  
From FY 78 to FY 79  
Total U.S. Funding \$ 498,000  
Date Prepared: 3/21/79

Project Title & Number: Integrated Area Studies

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><b>Project Purpose:</b></p> <p>The development and adoption by the GOG and non-Government agencies of a systematic planning methodology for determining priorities and allocating resources to provide the infrastructure and services required to achieve the goal stated above.</p>	<p>Conditions that will indicate purpose has been achieved: End of project status.</p> <p>Governmental and non-Governmental agencies will be utilizing the new planning methodology to:</p> <ol style="list-style-type: none"> <li>(1) Define with precision the nature and extent of the requirement for rural infrastructure and services.</li> <li>(2) Establish criteria for determining relative priorities between alternative infrastructure and services investment.</li> <li>(3) Select appropriate sites for investments in infrastructure and additional services.</li> <li>(4) Determine the roles, responsibilities and coordination required among institutions operating among the rural areas to assure complementarity and to avoid costly competition and duplication of effort.</li> </ol>	<p>Periodic observation or study of planning methodologies utilized by GOG and non-Governmental agencies.</p>	<p>Assumptions for achieving purpose:</p> <ol style="list-style-type: none"> <li>1. GOG and non-Governmental agencies willing and able to adopt new planning methodology.</li> </ol>

PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project: From FY 78 to FY 79  
Total U.S. Funding: \$498,000  
Date Prepared: 3/21/78

Project Title & Number: \_\_\_\_\_

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><b>Inputs:</b></p> <p>1. Technical Assistance for:</p> <p>a. Regional planning and analysis expertise.</p> <p>b. Determining economic potential of different levels of hierarchy.</p> <p>c. Mapping of Natural Resources and Economic Data.</p> <p>d. Land use classification advice.</p> <p>e. Computer analysis</p> <p>2. Local staffing to implement studies (Other Costs).</p> <p>3. Commodities:</p> <p>4. Other Costs - (Office space, secretarial service, computer time, vehicle rental, operation and maintenance).</p>	<p>Implementation Target (Type and Quantity)</p> <p>1. Technical Assistance</p> <p>AID Grant \$190,000</p> <p>--Regional Planning and Analysis advisors (1 x 15 mo. + 1 x 2 mo.)</p> <p>-- Economic Data Specialist (1 x 10 mo.)</p> <p>-- Economic Geographer (1 x 3 mo.)</p> <p>-- Land use classification advisor (1 x 2 mo.)</p> <p>Agronomist (1 x 3 mo.)</p> <p>Computer Advisor (1 x 4 mo.)</p> <p>2. Salaries of Local technicians</p> <p>--AID Grant \$206,000</p> <p>--GOG <u>189,000</u></p> <p>Total 395,000</p> <p>3. Commodities:</p> <p>a. Equipment &amp; Materials</p> <p>AID Grant 19,000</p> <p>GOG 35,000</p> <p>(b) Vehicle Purchase (AID) <u>11,000</u></p> <p>Total 465,000</p> <p>4. Other costs</p> <p>AID Grant 72,000</p> <p>GOG <u>153,000</u></p> <p>225,000</p>	<p>1. USAID monitoring records</p> <p>2. GOG financial reports</p> <p>3. Audits</p>	<p>Assumptions for providing inputs:</p> <p>1. Qualified Technical assistance will be available on a timely basis.</p> <p>2. Commodities will be available for purchase on a timely basis.</p> <p>3. Qualified technicians for implementation of studies are available or can be recruited locally on a timely basis.</p>

PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project: From FY 78 to FY 79  
Total U.S. Funding: \$ 498,000  
Date Prepared: 3-21-79

Project Title & Number: Integrated-Area Studies

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><b>Outputs:</b></p> <p><b>1. Study One:</b> Definition of Rural/Urban hierarchy and Inventory of Infrastructure and services.</p> <p><b>2. Study Two:</b> Inventory of Natural Resources and Determination of Economic Potential of each level of the Rural/Urban Hierarchy.</p> <p><b>3. Classification and Mapping of the information provided by the two studies.</b></p> <p><b>4. Initial Screening of investment possibilities.</b></p>	<p>Methods of Outputs: 1. Study One:</p> <p>a. Existing rural infrastructure and services information verified and available in a computerized format for each order in the rural/urban hierarchy.</p> <p>b. Computer programs to retrieve rural infrastructure and services information for purposes of analysis and mapping.</p> <p>c. Maps of each municipality and each higher order service center and its supporting system of lower order centers and hinterlands detailing linkages between the elements of hierarchy and the existence (or lack) of infrastructure and services.</p> <p>2. Study Two:</p> <p>a. Computerized data at the municipio level on total area by land classification.</p> <p>b. All resource data mapped.</p> <p>c. Computerized information for each municipality on present and potential crop production alternatives by land classification.</p> <p>d. Report of on-farm resource improvements and off-farm infrastructure and services indicated to facilitate use of land resources at their maximum potential.</p> <p>3. Information classified and prepared such that the analyst can utilize it to determine the suitability of a given investment.</p> <p>4. Application of the data and methodology to at least two proposed investment activities.</p>	<p>USAID, consultants and GOG monitoring of project.</p>	<p>Assumptions for achieving outputs:</p> <p>1. GOG counterpart agencies will support and actively participate in studies.</p> <p>2. GOG and non-governmental agencies will have the capacity to incorporate the data into a new planning methodology.</p>

ANNEX I

AID Target Area: 206 Municipalities

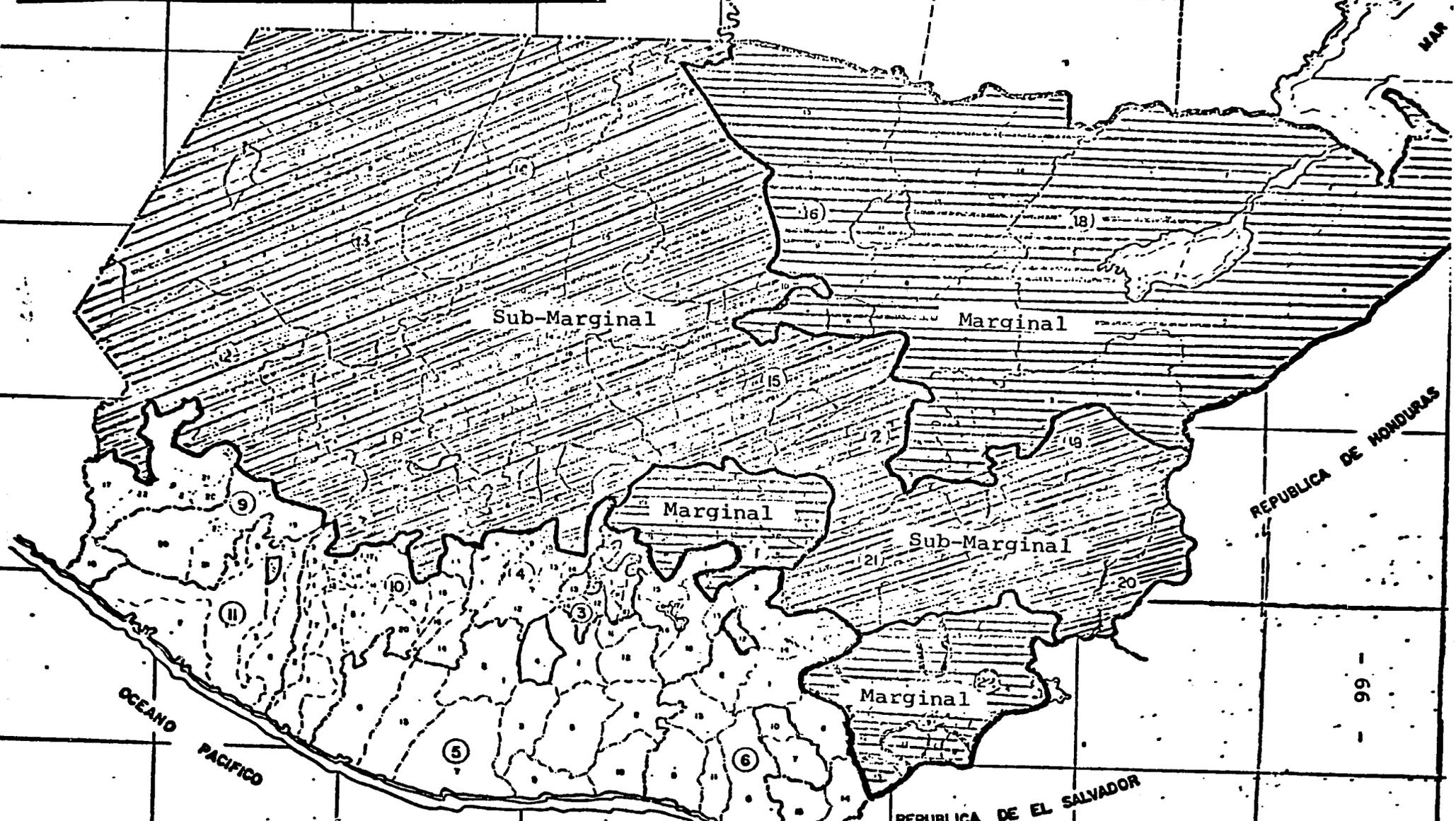


157 Sub-Marginal Municipalities



39 Marginal Municipalities

REPUBLICA DE GUATEMALA



REPUBLICA DE HONDURAS

REPUBLICA DE EL SALVADOR

DEPARTMENT OF STATE  
 AGENCY FOR INTERNATIONAL DEVELOPMENT  
 WASHINGTON, D.C. 20523

ENVIRONMENTAL THRESHOLD DECISION

Location : Guatemala  
 Project Title : Integrated Area Development Studies Grant  
 Funding : \$498,000 (\$220 in FY 78)  
 Life of Project : 3 years

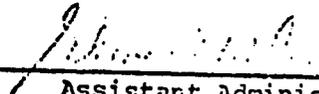
Mission Recommendation:

Based on the Initial Environmental Examination, the Mission has concluded that the project will not have a significant effect on the human environment and therefore recommends a Negative Determination.

The Latin America Bureau's Environmental Committee has reviewed the Initial Environmental Examination for this project and concurs in the Mission's recommendation for a Negative Determination.

AA/LA Decision:

Pursuant to the authority vested in the Assistant Administrator for Latin America under Title 22, Part 216.4a, Environmental Procedures, and based upon the above recommendation, I hereby determine that the proposed project is not an action which will have a significant effect on the human environment, and therefore, is not an action for which an Environmental Impact Statement or an Environmental Assessment will be required.

  
 Assistant Administrator  
 for Latin America  
 Jan. 31 1978  
 Date

## Clearances:

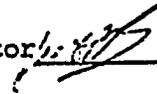
LA/DR: NDBrown N. B. H. / 6LA Environmental Coordinator: Rotto otto

INITIAL ENVIRONMENTAL EXAMINATION

**Location** : Guatemala  
**Project Title** : Integrated Area Development Studies Grant  
**Funding** : \$498,000 (\$220 in FY 78)  
**Life of Project** : 3 years

**Recommended Threshold Decision:** Negative Determination

**Mission Director's Concurrence:**

Frederick W. Schieck, Director  \_\_\_\_\_

## I. Description of the Project

The purpose of this project is to design appropriate planning mechanisms and procedures at the central, regional, municipal and village levels for provision of small-scale, basic economic and social infrastructure and services for the rural population. This purpose will be accomplished through the financing of two inter-related studies performed by the Institute for Municipal Development (INFOM) and the National Economic Planning Council. The first study will utilize central place theory and spatial analysis techniques to investigate and describe the economic and social relationships among rural and urban places within the 206 municipality study area. A ranking of towns and villages will be made in the basis of their infrastructure such as roads, bridges, markets and services provided (social services, agricultural extension, credit). This analysis will help identify micro-poles containing service, commercial and small industrial activities and assist in screening regions for gaps in infrastructure and services that need to be filled.

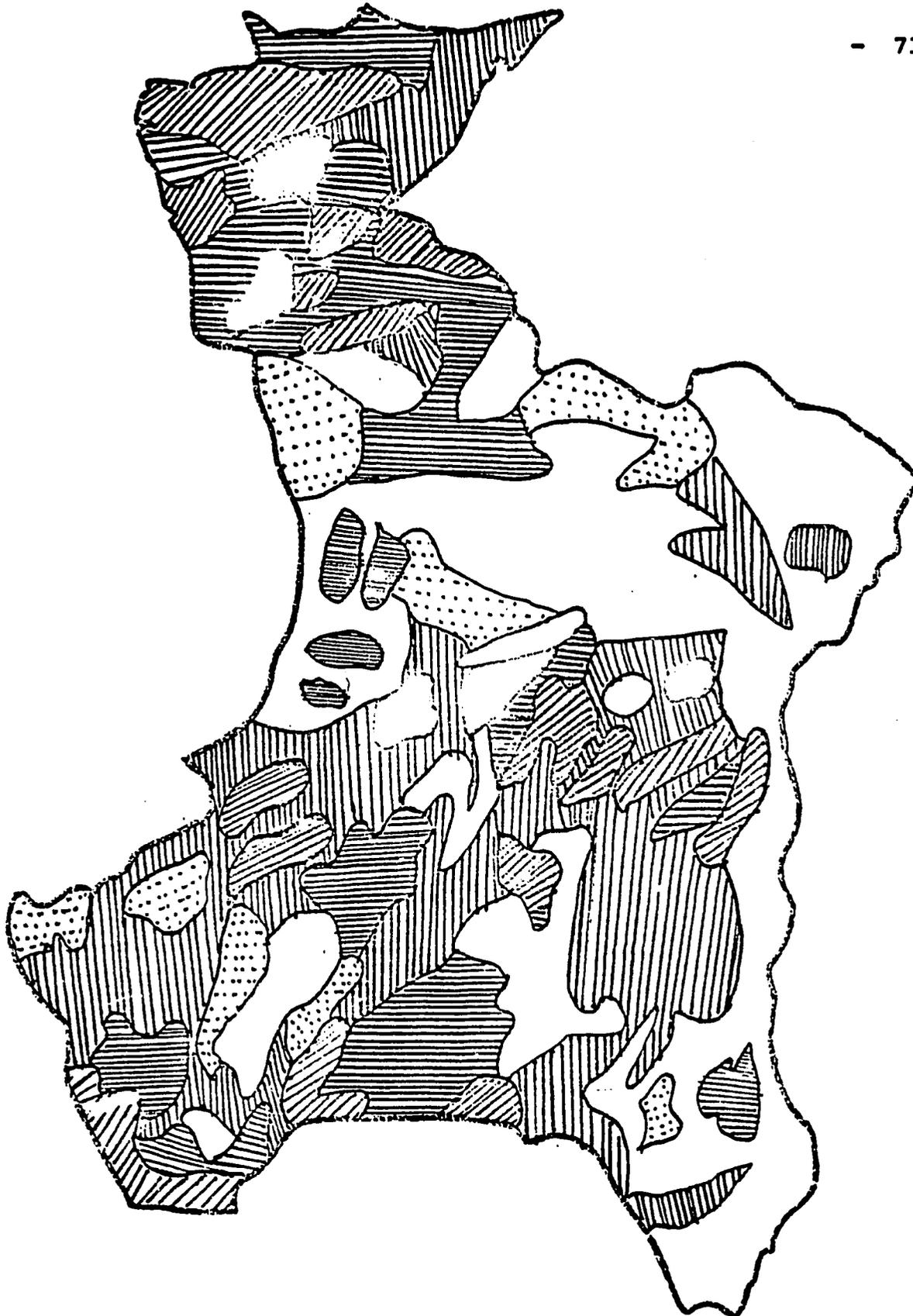
The second study will describe the natural resource base and economic potential at each level in the rural/urban hierarchy and determine what improvements can be made in the resource base and infrastructure to increase the productivity of all resources in the area thereby raising income levels of the farm and other rural population.

## II. Discussion of Impact and Recommendation for Threshold Decision

Since this project is financing studies for the use of national policy makers and donors, the threshold decision is based upon Section 216.2 of the Environmental procedures, which states that projects which are essentially analyses or studies will not normally require the filing of an Environmental Impact Statement or the preparation of an Assessment. Thus, a negative determination is recommended.



MAP # 2 - CAPACIDAD DE USO DE LOS SUELOS EN EL MUNICIPIO DE COMITANCILLO.

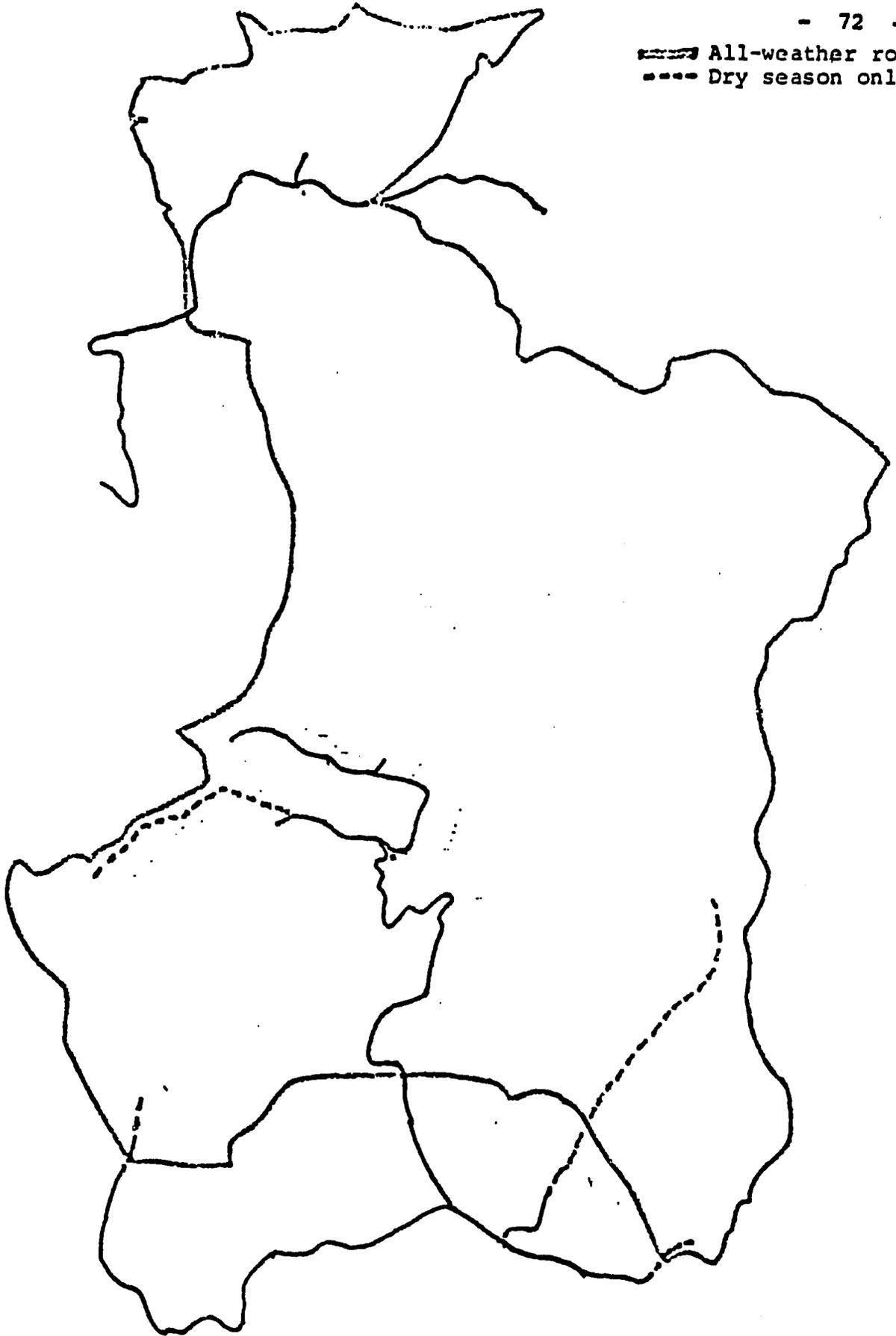


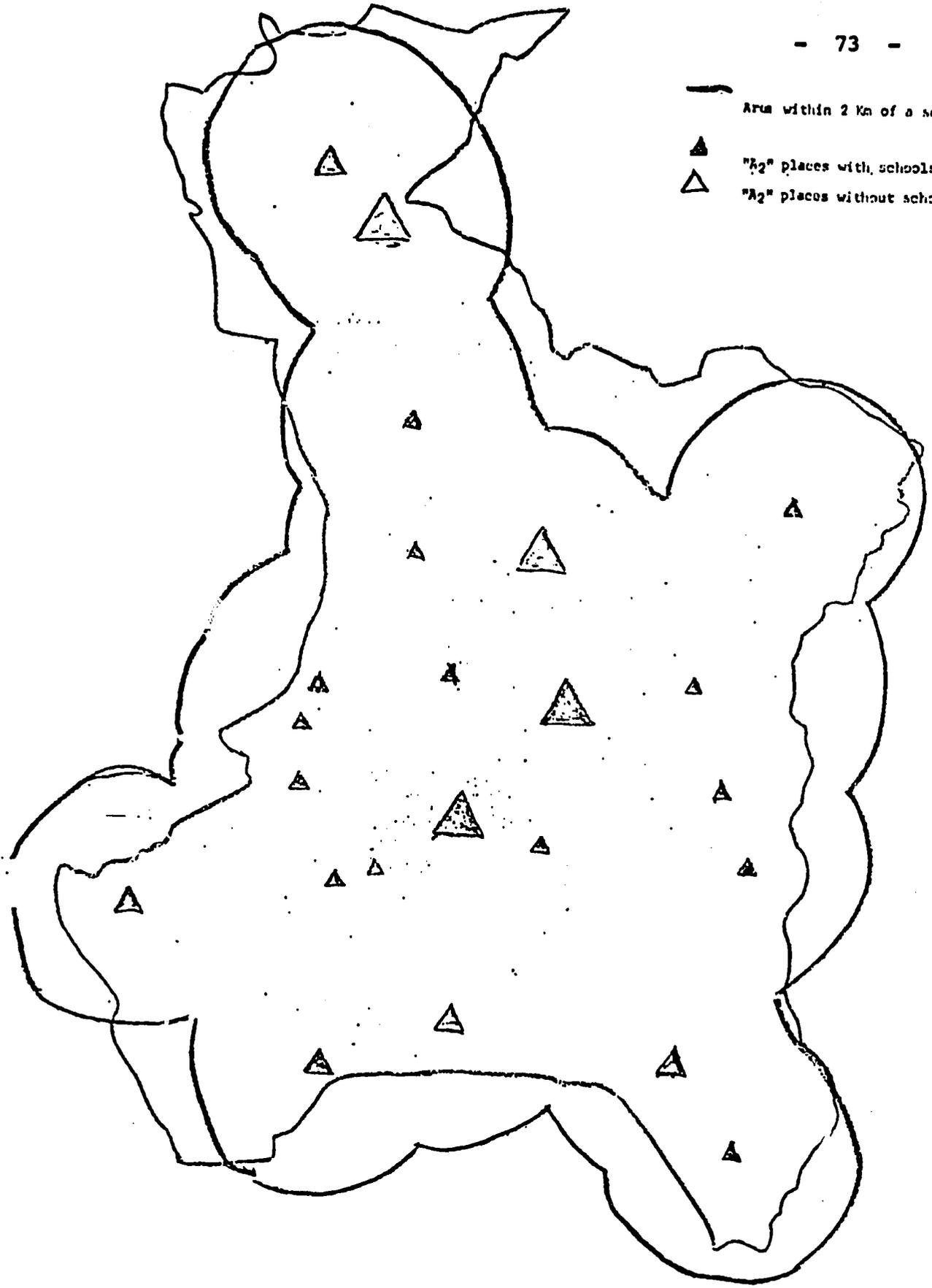
- |   |  |   |                                       |
|---|--|---|---------------------------------------|
|  | Suitable for row crops with minor limitations        |  | Suitable for permanent pasture        |
|  | Suitable for rotations of row crops and small grains |  | Suitable for pasture with limitations |
|  | Suitable for small grains                            |  | Suitable only for Forest purposes     |

MAP # 3 YEAR ROUND AND DRY SEASON ROADS

- 72 -

==== All-weather roads  
- - - - Dry season only





MAP # 4: MAP OF SCHOOL COVERAGE

ANNEX IV

ILLUSTRATIVE EXAMPLE OF UTILIZATION OF THE INFORMATION  
SYSTEM GENERATED UNDER THE PROJECT

In the development and revision of the project paper for Rural Electrification, it has been necessary for INDE to make a selection of aldeas and other small populated places that are targets for rural electrification. The first selection was of 180 aldeas. The selection was made on the basis of INDE records of aldeas that had solicited electrification and that were in the general area of transmission lines. A revision of the project paper has required that a second selection be made on the basis of more objective economic criteria. INDE has found it necessary to go to the field and gather observational data about certain economic and social infrastructure characteristics of the 180 aldeas first selected, in order to assign priorities to locations among those initially selected.

A preliminary survey of 12 aldeas, undertaken by the USAID Rural Development Office, found that the process used initially for selecting the aldeas did not take into account their spatial proximity to other populated places. This early selection was found not to be valid when criteria such as (1) the number of houses apt for electrification in the aldeas within a given area and (2) a minimum house density per aldea were considered.

If the data, maps, overlays, computer classification and retrieval programs to be generated by this project had been completed, INDE could have:

- 1) Examined the available data through observation of the maps and overlays.
- 2) Determined through a review of the data code book the types of data that could be utilized in analysis of where electrification efforts should be undertaken.
- 3) On the basis of (1) and (2) above, made a determination of the criteria it desired to apply in the selection of aldeas for electrification.

- 4) With these criteria, a selection of aldeas could have been listed by computer (or manually) according to their order of priority.

With such a list, it would have been a simple matter for INDE to provide an accurate list of aldeas to receive the number of connections programmed.

Selection of criteria would be based on the nature of the data inventoried in the course of this Project and the particular limits and priorities judged necessary by INDE.

The following provides a more specific illustration of how the above process might have been undertaken. On the basis of the data expected to be inventoried, INDE could have selected the following criteria:

- 1) Related to economies of scale for feasibility of electrification:
  - a. Density of houses per square or lineal kilometer.
  - b. Distance from an existing transmission or distribution line.
  - c. Number of total houses within a specified area that do not fall below a pre-established minimum density per kilometer.
- 2) Related to Level of Development:
  - a. Minimum distance from a year-round access road.
  - b. Minimum agricultural resource base per farm family.
  - c. Existence of an adequate water system for human and animal consumption or access to adequate water for installation of such a system once a power source is available.
  - d. Minimum level of other indicators of economic and social stability and growth potential such as:

- (i) School
- (ii) Church
- (iii) Alcaldía auxiliar
- (iv) Shops and/or businesses
- (v) Health facilities
- (vi) Non-agricultural economic activities, such as weaving, carving, itinerant buyers and sellers, etc.

(This latter set of criteria might be based on whether any 2 or 3 of the 5 indicators are present).

If the initial screening based on the criteria selected is too narrow or too broad, criteria adjustments could have been made and new lists generated until INDE was satisfied with the selection of aldeas (or areas including several of them). In addition, priorities could be established by ranking the areas screened on the basis of scale, how well they satisfy one or more of the selected criteria, e.g., ranked from highest number to lowest number of total houses, and by shortest distance to farthest distance from an existing transmission or distribution line.

As may be seen from this illustration, the process involved could be utilized for determining the locations of roads, market centers, health posts and other types of infrastructure and services.