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A PLANNING MODEL  
FOR  
RURAL ELECTRIFICATION  
IN  
DEVELOPING COUNTRIES

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## A Planning Model for Establishing Rural Electrification Strategies in Developing Countries

The planning model described in this paper is designed to familiarize AID Mission staff with the dynamics of rural electrification so that they may be better able to determine whether it is appropriate to initiate a rural electrification program and, if so, to better develop basic strategies for implementing rural electrification projects or programs in developing countries. The model may also be used as a tool for periodic program planning assessments by the host country's rural electrification program agencies or by donor agencies involved in rural electrification assistance. The model develops a systematic procedure designed to reduce those costs associated with inefficiencies that arise during the planning, organization, and implementation phases of rural electrification programs.

### INTRODUCTION

The costs of rural electrification systems, as of almost everything else in this inflationary age, are continually rising. Even when the electrification technology utilized for project implementation is both effective and innovative, capital costs of project facilities are clearly today's most important barrier to the electrification of rural areas in developing countries.

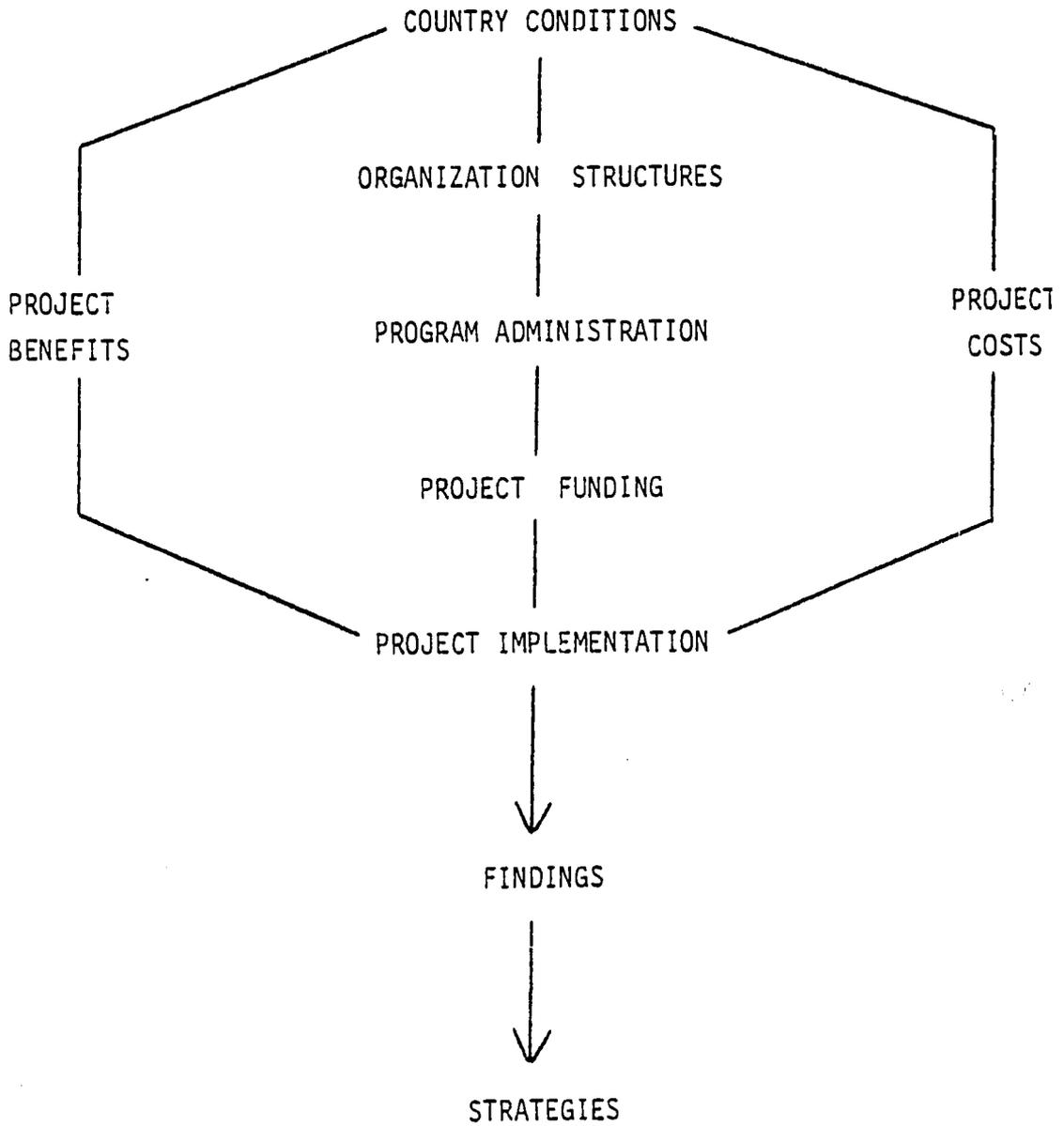
Moreover, when one recognizes that the underlying purpose of investment in rural electrification, in addition to improving the rural infrastructure, is to provide dependable service and financially self-sustaining operations through an institutionally sound framework, the implicit or indirect costs of rural electrification become apparent. These costs arise partly from improper planning and organizational procedures for attaining project goals and from

the lack of a strategy for assessing energy development options and project administration alternatives. Additional costs are also incurred through inefficiencies in unorganized implementation procedures and promulgation methods. Since only a finite quantity of capital can be allocated toward electrifying rural areas of the Third World, it behooves rural electrification resource planners to strive to reduce these indirect costs. Clearly, a systematic approach to organizing goals and appraising the factors leading to additional indirect costs during the rural electrification planning stage is vitally needed, especially by Third World countries with little experience in rural electrification.

The planning model set forth here will assist in organizing these planning, organizational and implementation considerations in an orderly fashion, thus helping to minimize indirect costs. The components of the planning model and their role in developing strategy options are described. Following these descriptions, a set of planning worksheets is provided, along with instructions for their use and interpretation.

The suggested process requires not only the time and involvement of AID Mission staff responsible for rural electrification project development but also the participation of LDC government officials with a knowledge of development priorities and programs of the country. Since no one systematic method of analysis can be devised which will incorporate the array of special situations displayed by each Third World country, this model is not designed to incorporate all the data needed to make total project or program appraisals. The planning process suggested here therefore formulates only basic program or project strategies.

"COMPONENTS OF THE PLANNING MODEL"



### COMPONENTS OF THE MODEL

There are nine components to the suggested planning model. Suggested planning worksheets to be used by Mission staff for each of these planning components are found in the Appendix.

1. Appraise conditions prevailing in LDC for initiating rural electrification development analysis

This first component of the planning model involves assessing whether or not an in-depth analysis of potential rural electrification program development in the LDC is warranted. It goes without saying that the general stage of economic and political development differs in each LDC. More importantly, certain environmental conditions in a particular LDC may or may not be sufficient to serve as the foundation for successful implementation of rural electrification programs. Therefore, the primary consideration at this stage of the planning process is to appraise key pre-existing political, cultural and economic factors that, as suggested from the experiences of other countries, are considered necessary before meaningful success of rural electrification programs in an LDC can be expected. Included in the Appendix is a worksheet designed to assist planners in assessing the degree to which such conditions prevail in the particular LDC as well as a methodology for assessing the efficacy of pursuing follow-up rural electrification planning activity in the LDC.

Moreover, in the event that a majority of these conditions are determined to exist and appear favorable, this planning component has one additional purpose. It suggests to decision makers the degree of future program success to be expected by isolating and identifying the level of those conditions in the country which presently pose a major barrier to program development and implementation. By mobilizing resources and influence, these decision makers may then be able to remove such barriers and create an atmosphere suitable for successful rural electrification development.

2. Determine LDC priority rural development goals and regions of country with greatest development potential

Underlying this planning model is the concept of the systematic organization of efforts to gain the greatest return from the limited capital available. This and the next planning component assume that the host country has limited capital resources which must be allocated among country regions (project areas) with the greatest benefit/cost return. The term "benefits" as used in this paper are regional economic/social benefits plus regional energy benefits expected from the implementation of a rural electrification project. Costs are defined later.

The purpose of this particular planning component is twofold: to define these benefits from electrification and then to determine the relative levels of expected intensity of the benefits in various project areas. Suggested criteria for measuring rural electrification benefits are found on Worksheet #2

in the Appendix. Potential economic/social benefit measurements accruing from investment in rural electrification have been classified into four categories on the worksheet: potential increases in production and employment, potential increases in commerce and services, potential social benefits and potential political benefits. Potential energy development benefits accruing from investment in rural electrification are classified into two categories: potential fuel substitution savings and potential domestic energy resource base use.

All these benefit measurements must first be assigned jointly determined priorities, according to their relative development importance, by LDC officials and AID staff. Next, weights indicating the expected value for attainment of each rural development goal must be determined for each region. These factors will then be used to generate a schedule of project priorities by region of the country.

### 3. Appraisal of rural electrification costs

Component two of the planning model focused on determining where the greatest potential benefit of rural electrification can be expected to accrue. This component looks at the cost side of allocating scarce financial resources among rural electrification project areas of a country. As these costs are factored into decision-making formulae, certain adjustments are likely to occur in the ranking of a country's priorities for regional rural electrification investment. For example, an area seeming to rate top priority up to

this stage due to the potential benefits likely to result may require extremely high construction costs to develop due to its distance from the existing transmission grid. As a result of considering this cost, this area may no longer appear as attractive and could be outranked by another area potentially capable of producing fewer gross social benefits, but at a lesser cost.

Suggested measurement criteria and a methodology for appraising electrification costs are established on Worksheet #3 of the Appendix. The measurement criteria take the form of rural area power supply options available for development. Priority weights must be assigned to these options by decision makers before area priorities by cost consideration can be produced.

4. Determine rural electrification institutional framework preferred by LDC

The fourth component of the planning model involves identifying the LDC organizational framework under which rural electrification is carried out as well as suggesting changes to this framework to facilitate development. Worksheet #4 is designed to assist planning principals in identifying rural electrification organizational relationships in LDCs. As general information, brief descriptions of four basic rural electrification institutional arrangements in LDCs can be found in the Appendix preceding Worksheet #4.

5. Status of country rural electrification funding and assistance availability

Once general area priorities and basic agency responsibilities for a national rural electrification program have been determined, the next activity suggested in the planning model is the assessment of current and planned funding for rural electrification. One purpose of this planning component is to ascertain whether these available and anticipated capital resources are, or will be, allocated to the preferred rural electrification agencies and to the preferred rural electrification regions identified earlier.

Worksheet #5 of the Appendix includes a general framework for making these assessments. Part I of the worksheet summarizes basic data pertaining to the availability of rural electrification funding in the LDC. Part II of the worksheet summarizes the level of program support (i.e., capital, technical, or training assistance) that appears desired and necessary for the particular LDC.

6. General appraisal of overall rural electrification program

Assuming that favorable country conditions prevail, thus indicating that rural electrification project development has the necessary environmental base for success (component 1), and assuming that some need exists for Mission

assistance (component 5), this and the subsequent suggested planning components should now be undertaken.

As mentioned above, rural electrification program policies and practices, if not adequately implemented, may lead to unnecessary program costs, ineffectiveness and inefficiency. Worksheet #6 contains a checklist of suggested rural electrification program policies and practices that should lead to optimal program organization, supervision and direction. Assessment of the level of implementation of these policies and practices will indicate likely areas of weakness in program administration requiring attention and improvement. Included on the worksheet is a column listing government agencies that should be candidates for taking responsibility for appropriate corrective action to remedy the identified weaknesses.

7. (Optional Component): Appraisal of operating project(s) requesting AID assistance

On occasion, Missions may receive requests for assistance from rural electrification projects already in operation. In certain cases the requests may originate from independent rural power projects, i.e., privately- or publicly-owned projects neither funded nor supervised by responsible LDC national power agencies. In all such instances a separate appraisal of that project's operations is necessary.

Worksheet #7 of the Appendix contains a project checklist of operating

performance measurements, practices and support assistance, showing levels of effectiveness and efficiency. The checklist can be used to identify areas of weakness in project operations. The worksheet also includes a column for listing necessary remedial action and a column for identifying the recommended party to undertake these actions. If more than one project is involved, a worksheet should be completed for each project.

Although this planning component appears to be independent of the planning process suggested above, fulfilling all planning components suggested herein will shed light on the appropriateness of this project's request for assistance and on external factors which may impinge on the success of the project.

#### 8. Summary findings of appraisals

This planning component serves two purposes. First, it condenses salient information identified during the seven planning appraisal steps described above so that an overview of the program's potential, needs and development constraints can be obtained. Second, it summarizes this information in an orderly fashion so that appropriate program development strategies can be more easily derived.

Worksheet #8 is a suggested format for recording key information identified at each of these appraisal levels which addresses these purposes. Information included on the worksheet includes: key data pertaining to program institutional relationships, data pertaining to country conditions which may constrain effective implementation of a countrywide rural electrification program,

a listing of key regions in an LDC where rural electrification development appears most appropriate, data on suggested AID program assistance, and specific data identifying operational shortcomings of a particular project.

9. Synthesis of findings and strategy development

The last component of the planning model involves arranging the study's summary findings into an orderly format for a strategy that can be used as the basis for initiating Mission program assistance. Worksheet #9 of the Appendix contains two suggested bases for organization of data. The first schedule includes data relating to basic strategies needed for the orderly development of overall rural electrification activities in the LDC. The second schedule includes data relating to basic strategies needed for the orderly development of a specific project requesting Mission assistance.

Both schedules identify assistance needed to meet the LDC development goals ascertained during the assessment, as well as remedial actions suggested to correct major underlying implementation shortcomings. The schedules furthermore identify the agency that should undertake the assistance, the suggested year for implementation, as well as its suggested funding source.

A P P E N D I X

PLANNING WORKSHEETS

AND

BASIC RURAL ELECTRIFICATION INSTITUTIONAL ARRANGEMENTS

## INTRODUCTION TO THE APPENDIX

A Mission coordinator should be assigned to oversee the planning study. His first responsibility should be to familiarize himself with this planning document and the accompanying worksheets. In most circumstances alterations will have to be made to the worksheets not only to incorporate unique country conditions, but also to reflect the specific purpose for which the study was undertaken.

After all appraisal worksheets have been reviewed and modified accordingly, the coordinator should assign specific tasks among appropriate Mission personnel undertaking the study. Special attention should then be given to reviewing and revising the summary worksheets (#8 and #9) to make them more responsive to the special requirements of the study.

## WORKSHEET #1

"Major Underlying LDC Pre-existing Conditions Necessary Before Meaningful Success of Rural Electrification Programs Can Be Expected"

(Instructions and Interpretation)

1. The responsibility to complete this form should be assigned to AID Mission staff personnel with comprehensive knowledge of the host country. After the form is completed, full explanation of "no" and "uncertain" responses made on the worksheet should be attached.

2. Items listed as primary conditions on the worksheet are those items deemed essential pre-existing conditions before successful implementation of national rural electrification programs can be expected. Therefore any "no" response for these items indicates that follow-up planning analysis is most probably premature.

3. Items listed as secondary conditions on the worksheet are those items deemed as supplemental development conditions that generally lead to successful rural electrification projects. As such they reflect integrated inputs, which although necessary, may be developed in tandem with a nationwide rural electrification program.

MAJOR UNDERLYING LDC PRE-EXISTING CONDITIONS NECESSARY BEFORE MEANINGFUL SUCCESS OF RURAL ELECTRIFICATION PROGRAMS CAN BE EXPECTED.

<u>Yes</u>	<u>Uncertain</u>	<u>No</u>	<u>Primary Conditions</u>
—	—	—	<u>LDC Political Climate:</u> (Indicates ability to organize effective program.) Stable political leadership with commitment to guarantee international monetary borrowing?
—	—	—	<u>LDC Government Attitude:</u> (Indicates program cooperation from government.) Strong desire exists to increase rural incomes through rural works projects?
—	—	—	<u>Rural Social Climate:</u> (Indicates need and desire for electricity, and ability of rural areas to assimilate innovations.) High density rural populace, very little electric service? Effective coalitions of rural population with high or increasing literacy rates?
—	—	—	<u>L D C Energy Resources:</u> (Indicates ability to supply electric service to rural areas.) Potential renewable energy or fossil fuel resources exist within the country, or surplus electric power is available?
—	—	—	<u>Rural Area Human Resources:</u> (Indicates capability to make productive uses of electricity.) Basic industrial labor skills and entrepreneurs found in the rural population?
<u>Secondary Conditions</u>			
—	—	—	<u>Rural Infrastructure:</u> Infrastructure appropriate to rural electrification (roads, ports, irrigation, etc.) either exists or being developed?
—	—	—	<u>Rural Services:</u> Rural services appropriate to skills development (formal or non-formal schooling and training facilities) either exist or are being developed?
—	—	—	<u>Rural Agriculture/Industrial Base:</u> Potential areas of comparative advantage exist in agricultural economy?
—	—	—	<u>Rural Area Money Resources:</u> Bank or non-bank credit available in rural areas?
—	—	—	<u>Ecology:</u> Rural electrification appropriate input for improving land management practices (forest, water, mineral resources) of LDC?

## WORKSHEET #2

### "Ranking of Project Areas or Regions According to Expected Benefits"

#### (Suggested Worksheet Weighting System and Instructions)

1. Both an AID representative(s) and an LDC government official(s) should first assign a value (1 through 5) for each development goal category (A1 through C2) according to the relative importance of each category. The mean value assigned to each category should then be entered in the column headed "Joint Priority." This value constitutes a jointly determined weight of each category's importance and should be entered in the appropriate region line to which it pertains (lines "a").

2. The AID and LDC officials should then jointly assign a value in a similar manner (1 through 5) for the expectation of benefits to be derived from each region (project area) for each development goal category. This value should then be entered under the appropriate region to which it pertains (lines "b"). The line "a" value then should be multiplied by each region's respective line "b" value and the product entered in the appropriate line in the region to which it pertains (line "c").

3. Summing the line "c" values in each region or project area column will then provide an index of the relative benefits expected to be obtained from each project or region.

WORKSHEET #2

RANKING OF PROJECT AREAS OR REGIONS ACCORDING TO EXPECTED BENEFITS:  
 (The greater benefits should receive the greatest values.)

Country Rural Development Goals

A. Rural Goals

1) Potential increases in production and employment

- . Farm Production
- . Agro-Processing
- . Manufacturing (large-scale)
- . Mining
- . Fishing
- . Other (specify \_\_\_\_\_)

2) Potential increases in commerce and services

- . Small Business
- . Rural Credit
- . Rural Communications
- . Transport Accessibility
- . Health Services
- . Education Facilities
- . Other (specify \_\_\_\_\_)

	AID Priority Value	LDC Priority Value	Project Priority Value  (If Appropriate)	Mean Joint Priority Value	Existing Regional Conditions to Attain Goal			
					Region or Project Area			
					#1	#2	#3	etc.
(a)								
(b)								
.								
.								
(c)								
(a)								
(b)								
.								
.								
(c)								

Partial Sum (c's)  
 enter in appropriate  
 space on page 5

WORKSHEET #2

Date:

Country Rural Development Goals

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1. Rural Development

1) Potential social benefits

- . Stop Urban Migration
- . Skills Development
- . Local Political Participation
- . Other (specify \_\_\_\_\_)

2) Potential political benefits

- . Social Pacification
- . National Identification and Unity
- . Other (specify \_\_\_\_\_)

AID Priority Value	LDC Priority Value	Project Priority Value	Mean Joint Priority Value	<u>Existing Regional Conditions to Attain Goal</u> Region or Project Area			
				1	2	3	4
X	X	X	X				
X	X	X	X	(b)			
X	X	X	X	(c)			
X	X	X	X	(a)			
X	X	X	X	(b)			
X	X	X	X	(c)			

Partial Sum (c's)  
entered in appropriate  
space on page 3.



## WORKSHEET #3

### "Ranking of Project Areas or Regions According to Expected Costs"

#### (Suggested Worksheet Weighting System and Instructions)

1. Worksheet #3 should be completed according to the general instructions included for Worksheet #2. Two main differences should be noted, however. First, since this worksheet represents the cost side of providing electric service, AID and host country officials filling out this form must acquaint themselves with the specific costs in the country of providing electricity according to the energy source options listed before assigning cost weights to each option. Second, the power supply option considered most valuable for that country should receive the lowest priority weight value.

2. Accordingly, it is suggested that a value (5 to 1) be assigned for the power supply options listed on the worksheet with the value of 1 representing the option considered least costly in the country. Moreover, it is suggested that a value (5 to 1) be assigned to the existing regional conditions that satisfy each power supply option considered, with a value of 1 assigned to those regional conditions which satisfy the implementation of the power supply option most fully (regional lines "b").

3. If deemed appropriate local planning principals can utilize this worksheet in conjunction with Worksheet #2 to undertake preliminary benefit/cost planning analysis of providing rural electric service among various regions of the country. A suggested form for such analysis is found on Worksheet #8, item 6.

WORKSHEET #3

RANKING OF PROJECT AREAS OR REGIONS ACCORDING TO EXPECTED COSTS.  
 (The higher costs should receive the higher values.)

Rural Electrification Power Supply	AID Priority Value	LDC Priority Value	Project Priority Value (If Appli- cable)	Mean Joint Priority Value	Existing Regional Conditions that Satisfy Region or Project Area			
					#1	#2	#3	Etc.
. National Grid Expansion					(a)			
					(b)			
					(c)			
. Regional Grid Expansion					(a)			
					(b)			
					(c)			
. Isolated Generation Units (Fossil fuels)					(a)			
					(b)			
					(c)			
. Isolated Generation Units (Renewable fuels)					(a)			
					(b)			
					(c)			
. Dispersed Generation Units Feeding National or Regional Grid, or other option. (If other option, specify _____)					(a)			
					(b)			
					(c)			
				Sum (c's)				

## BASIC RURAL ELECTRIFICATION INSTITUTIONAL ARRANGEMENTS

### National Power Agency

The circumstance where decision-making authority for the purpose of implementing rural electrification programs is centralized in one national power agency is one extreme of these institutional arrangements.

As with alternative structures of authority, there are trade-offs. In the case of the national administration of a rural electrification program, this trade-off tends to be between efficiency and control. The totally centralized structure assures complete control of all power programs by the national government. This may be considered necessary in order to assure compatibility of the rural electrification program with national energy goals and to facilitate the coordination of scarce power resources. On the negative side, however, the efficiency of bureaucracies tends to be reduced as they expand in size and responsibilities. As the information that must be digested and the decisions to be made increase, this problem becomes exacerbated. Moreover, the problem becomes especially intense when individual projects of a rural electrification program are geographically dispersed. Thus, the totally centralized approach is probably best suited for smaller countries with homogeneous national energy programs.

### Regional Power Authorities

National electrification programs lend themselves to division along geographical as well as functional lines. The geographical delimitation of

authority is most often represented by a series of scaled-down national power authorities, each with jurisdiction over a particular area. The division by function (a national rural electrification agency) is discussed below.

The institutional arrangement characterized by regional power authorities tends to preserve some of the beneficial aspects of the totally centralized approach while reducing associated bureaucratic problems. While decisions can be made with the overall philosophy of the national energy program in mind, regional managers can be better attuned to the particular problems and potential of the individual projects over which they have influence. While some control must be sacrificed by a national government under this arrangement, decisions can be implemented in a more appropriate and timely manner. Thus, regional power authorities tend to be best suited for larger countries with moderately diverse national energy programs, or where autonomous regional political structures have evolved.

#### National Rural Electrification Agency

The second type of institutional arrangement for rural electrification decision-making authority often found in developing countries is the delimitation by function. That is, a national rural electrification agency (NREA) has overall policy and coordination jurisdiction for the entire national rural electrification development program. It is a national power agency whose responsibilities are limited to the rural electrification program. Although the NREA has ultimate responsibility for the development, coordination, financial and technical support for the national rural electrification

program, as is the case in the Philippines and Bangladesh, specific project administration, control and ownership is left to local organizations, such as electric cooperatives.

This arrangement tends to modify the totally centralized power agency approach, as does the regional power authority approach, but with some major variations. First, since all policy authority for rural electrification is vested in one place, the NREA's decisions can be more closely monitored by the central government. However, since under this approach geographical dispersion of individual projects is common, there is more local control which assures more decision making at the project level.

The question therefore arises as to the best way to divide the responsibilities of a rural electrification program initiated by the central government. Although there is no clear-cut answer, some relationships are apparent. Efficiency and political realities play leading roles. Political systems may support or de-emphasize local control and leadership. The NREA approach, therefore, tends to be best suited for larger countries with diverse energy and rural development programs where local control of development projects is encouraged by the national government.

### Local Organizations

Frequently, rural electrification is not initiated by a national agency. The high demand for electricity in rural areas of the Third World often motivates local initiatives by farmers' associations, municipal governments,

or local cooperatives formed expressly for the purpose of bringing electricity to the area. Even though projects initiated by local organizations are not necessarily designed in conformity with a national program, there is justification, on grounds of efficiency, for technical cooperation and support by the national agency. Rural electrification projects initiated by local organizations appear best suited for situations where local initiative is not likely to compete with projects already being supported by national agencies.

## WORKSHEET #4

### "Assessment of Preferred Changes to Rural Electrification Institutional Implementation Framework"

#### (General Interpretation and Instructions)

1. Rural electrification requires certain institutional structures with ultimate responsibility for the implementation and success of rural electrification programs and projects. However, in many countries, especially those with little electrification experience, the existing arrangements of institutions and agencies may be inadequate.

2. Program officials can use the following form to determine necessary institutional changes. By checking the appropriate boxes indicating both present and preferred arrangements and noting their differences, the program officials may produce a preliminary outline of necessary changes to be made in the institutional structure. Further instructions are found on the form.



B. Preferred Framework: List all preferred organizations that should be involved in LDC R. E. planning and operations. Check appropriate column for preferred responsibilities.

	National Level						Regional Level						Local Level					
	Private		Quasi Public		Government		Private		Quasi Public		Government		Private		Quasi Public		Government	
	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	G
Preferred LDC organizations and institutions for involvement in rural electrification.																		

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C. Necessary Changes:

List specific suggested necessary changes	List reason for suggested changes

## WORKSHEET #5

### "Status of Country Rural Electrification Funding and Assistance Availability"

#### (General Instructions)

1. The performance of this planning component requires time and research to accomplish. The following research steps are suggested:

- a. First, Worksheet #4 should be examined to identify all major agencies in the country which have or may have authority to fund rural electrification projects;
- b. Second, personnel of each such agency should be interviewed with respect to the data items listed on the worksheet; and
- c. Third, information and data derived from these interviews should be then summarized on Worksheet #5.

2. Care should be taken to assign this research activity of the planning process to a Mission staff member knowledgeable of capital development projects. Care should also be taken to interview only decision-level officials at each agency surveyed.

STATUS OF COUNTRY RURAL ELECTRIFICATION FUNDING AND ASSISTANCE AVAILABILITY

I. Status of Country R. E. Funding Availability:

A. Estimated local capital funding available for existing R. E. projects

National Government

Regional Government

Municipal Government

Local Utilities:

Privately owned

Publicly owned

Other (specify \_\_\_\_\_)

Total

B. Estimated donor capital funding available for existing R. E. projects

Multinational Donors

Bilateral Donors

Private Organizations

Other (specify \_\_\_\_\_)

Total

	Year			Receiving Agencies	Project Area Locations
	1	2	3		
Local Currency					
U.S. Dollars					

II. R. E. Funding Needs: (Note: Numerous listings may be required.)

A. Estimated supplemental funds required for project or program expansion over next three years. (Specify agency and project areas).

	S	Suggested Funding Source	Local Currency	Suggested Funding Source
Capital assistance				
Technical assistance				
Training assistance				
Other (specify _____)				

B. Repeat A. As required.

## WORKSHEET #6

### "General Appraisal of Overall Rural Electrification Program"

#### (General Instructions)

1. The performance of this planning component also requires time, research and study. The Mission personnel most knowledgeable of the activities of the LDC "lead" power agencies should undertake this activity. Again, numerous interviews with policy makers in the power sector may be required.

2. The worksheet requires two separate judgments to be made by the individual making the assessment. After conducting the necessary interviews he should check off the most appropriate response to the data items in the "activity implementation status" column. He then must identify the most appropriate agency to undertake corrective action when a program activity weakness is apparent (i.e., those activities noted on the worksheet as either being not implemented at all or only partially implemented).

GENERAL APPRAISAL OF OVERALL RURAL ELECTRIFICATION PROGRAM:

Activity Implementation Status				Suggested Program Policy and Practice Activities	Suggested Corrective Action	Agency for Corrective Action
Imple- mented	Partially Implemented	Not Implemented	Not Applicable			
—	—	—	—	1. Rural Electrification Development Planning:	—	—
—	—	—	—	• R. E. goals and plans are incorporated in the LIC development plan.	—	—
—	—	—	—	• R. E. construction is coordinated with other government rural development projects.	—	—
—	—	—	—	• R. E. construction is coordinated with the LDC national power supply agency.	—	—
—	—	—	—	2. Rural Electrification Funding and Credit:	—	—
—	—	—	—	• Local currency for project funding is committed and available on "soft term" basis.	—	—
—	—	—	—	• Local public funds are available for local public facility electric billings.	—	—
—	—	—	—	• Credit is available for consumer connection charges and housewiring.	—	—
—	—	—	—	3. Tax Exemption and Franchises:	—	—
—	—	—	—	• Imported materials are free of custom duties and delays.	—	—
—	—	—	—	• Tax exemption is given on project operations and plant assets.	—	—
—	—	—	—	• Franchise encroachment of R. E. service areas is protected by law and operating franchises are granted to projects.	—	—

GENERAL APPRAISAL OF OVERALL RURAL ELECTRIFICATION PROGRAM

Activity Implementation Status				Suggested Program Policy and Practice Activities	Suggested Corrective Action	Agency for Corrective Action
Imple- mented	Partially Implemented	Not Implemented	Not Applicable			
				<p>4. Tariffs and collections:</p> <ul style="list-style-type: none"> <li>. Tariff structures are responsive to cost of service.</li> <li>. Formal wholesale power agreements for R. E. projects are required or full cost recovery of R. E. auto-generation costs are required.</li> <li>. Effective billing and collection practices developed and monitored.</li> </ul>		
				<p>5. R. E. Agency Institution:</p> <ul style="list-style-type: none"> <li>. An independent and technically staffed rural electrification agency is organized.</li> <li>. Dynamic, influential, and stable leadership is present.</li> <li>. Adequate program/project funding and regulatory authorizations are delegated to the R. E. agency.</li> <li>. Attractive and sufficient agency wage and salary plans and incentives are developed.</li> </ul>		

GENERAL APPRAISAL OF OVERALL RURAL ELECTRIFICATION PROGRAM

Activity Implementation Status				Suggested Program Policy and Practice Activities	Suggested Corrective Action	Agency for Corrective Action
Not Started	Partial Implementation	Substantially Implemented	Completed			
				6. Technical Standards and Controls:		
				• Low-cost R. E. design and construction standards and specifications are developed.		
				• These standards and specifications are used for all new R. E. project construction.		
				• Joint electric design standards are developed among power authorities.		
				• Project maintenance and inspection programs are developed and monitored.		
				7. Operations Standards and Controls:		
				• Project uniform reporting and accounting systems are developed and are operational.		
				• Project operations monitoring systems are developed and are operational.		
				• Project continuing property record systems developed, operational and kept current.		

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GENERAL APPRAISAL OF OVERALL RURAL ELECTRIFICATION PROGRAM

Activity Implementation Status				Suggested Program Policy and Practice Activities	Suggested Corrective Action	Agency for Corrective Action
Imple- mented	Partially Implemented	Not Implemented	Not Applicable			
—	—	—	—	8. Training Programs:	—	—
—	—	—	—	• For headquarters agency personnel.	—	—
—	—	—	—	• For project management personnel.	—	—
—	—	—	—	• For project employees.	—	—
—	—	—	—	9. Materials Availability:	—	—
—	—	—	—	• Sources of local construction materials and contractors identified and developed with materials and services delivered when needed.	—	—
—	—	—	—	• Sources of needed foreign construction material and contractors identified and developed with materials and services delivered when needed.	—	—
—	—	—	—	• Effective material warehousing and material distribution procedures are developed and are operational.	—	—

GENERAL APPRAISAL OF OVERALL RURAL ELECTRIFICATION PROGRAM

Activity Implementation Status				Suggested Program Policy and Practice Activities	Suggested Corrective Action	Agency for Corrective Action
Imple- mented	Partially Implemented	Not Implemented	Not Applicable			
				1. Productive Use of Electricity <ul style="list-style-type: none"> <li>. Consumer training programs in the productive use of electricity undertaken.</li> <li>. Consumer credit assistance programs for productive end uses of electricity undertaken.</li> <li>. Marketing and business development research and assistance to consumers and to electric equipment and material suppliers undertaken.</li> </ul>		

## WORKSHEET #7

### "General Appraisal of Operating Project Requesting AID Assistance"

#### (General Instructions)

1. Appraisal of these requests should be made by Mission staff with intimate knowledge of electric utility operations. If such expertise is not available, it is suggested that the Mission either request the services of a qualified consultant to undertake the appraisal or assign the appraisal to Mission capital development or rural development staff. Assignment of capital development staff is more appropriate in cases when the project to be appraised is an operating unit of a national power company. Assignment of rural development staff is appropriate when this is not the case.

2. Site inspection of the project is optional. Management personnel from the project requesting assistance should first answer the questions found on the worksheet. The Mission representative then should go over each question with project management staff, asking them to verify each response. If the verification is insufficient, site inspection may be necessary before the most appropriate responses can be made on the worksheet.

General Appraisal of Operating Project Requesting AID Assistance

A. Technical and Administrative Performance

1. Present power outage performance
2. Present voltage stability
3. Present condition and adequacy of generation equipment (if applicable)
4. Present condition and adequacy of distribution lines
5. Present condition and adequacy of office and equipment
6. Percent of total households served located in rural areas
7. Present rate affordability by low income rural households
8. Payments of bills by consumers

Excellent	Satisfactory	Poor	Suggested corrective action	Suggested agency for corrective action



C. Project Support

1. Community

- . Consumers cooperative in project construction
- . Community financial assistance for construction or project programs
- . Favorable local tax and legal climate

2. Government

- . Adequate technical assistance from government
- . Adequate financial assistance from government
- . Favorable national legislation

3. Private organizations

- . Financial assistance from private organizations
- . Coordinated development programs with private organizations
- . In-kind contributions from private organizations

Yes	Some or Partial	No	Suggested Corrective Action	Agency for Corrective Action

Summary Findings of Appraisals

(Suggested Format)

1. Study purpose and participation:

Study purpose: \_\_\_\_\_

\_\_\_\_\_

Initiated by: \_\_\_\_\_

Officials involved: \_\_\_\_\_

Formal Mission interventions requested (type, if any, and by whom):

\_\_\_\_\_

\_\_\_\_\_

2. LDC R. E. institutions (Transfer pertinent data from Worksheet #4 and complete additional information as required.)

a. Existing agencies and organizations presently involved in R. E. (list)

Name of Agency of Organization	R. E. Functions Performed	R. E. Project Locations (if any)

b. Proposed changes in agencies and organizations involved in R. E.

Name of Agency or Organization	Suggested function to be dropped	Suggested function to be added

3. LDC conditions constraining effective countrywide implementation of R. E.  
(Transfer and list pertinent data from worksheet #1)

- a. \_\_\_\_\_  
\_\_\_\_\_
- b. \_\_\_\_\_  
\_\_\_\_\_
- c. \_\_\_\_\_  
\_\_\_\_\_

4. LDC rural development goals and ranking of regional development potential to attain these goals. (Transfer pertinent data from Worksheet #2 and complete additional information as required.)

<u>Goals</u> (List goals in descending order from "Joint Priority" column of Worksheet #2)	Lead LDC Agency responsive for development goal	<u>Ranking of Regions</u> (List regions in descending order according to summation of priority index values calculated on Worksheet #2)

5. LDC R. E. power supply development option priorities and ranking of regional conditions to satisfy these priorities. (Transfer pertinent data from Worksheet #3)

<u>Options</u> (List options in descending order from "Joint Priority" column of Worksheet #3)	<u>Ranking of Regions with Respect to Option Priorities</u> (List regions in descending order according to summation of priority index values calculated on Worksheet #3)

6. Project area or regional priority R. E. implementation rankings, based on benefit to cost indices. (Transfer and list pertinent data from Worksheets #2 and #3)

(Column #1) Project area or region	(Column #2) Sum of index priority values (from worksheet #2)	(Column #3) Sum of index priority values (from worksheet #3)	(Column #4) Benefit/Cost Index (Divide col. #2 by column #3)	Priority Rankings (highest figure in #4 = 1, next highest = 2, etc.)

7. Anticipated LDC R. E. program development activity involving possible AID funding. (Transfer pertinent data from Worksheet #5. Several listings may be required.)

a. Specify program activity and agency:

Type of Project Intervention Needed or Anticipated	Funding Required			
	(\$ ) Dollars		Local currency	
	Amount	Suggested AID or non-AID Funding Source	Amount	Suggested Funding Source
1. <u>Technical Assistance</u> (Specify) _____ _____				
2. <u>Capital Assistance</u> (Specify) _____ _____				
3. <u>Training Assistance</u> (Specify) _____ _____				
4. <u>Other Assistance</u> (Specify) _____ _____				

- b. Suggested complementary development assistance activities needed to supplement this R. E. program activity.

Type of assistance needed	Suggested LDC agency for assistance
1. <u>Technical Assistance</u> (Specify) _____ _____	
2. <u>Capital Assistance</u> (Specify) _____ _____	
3. <u>Training Assistance</u> (Specify) _____ _____	
4. <u>Other Assistance</u> (Specify) _____ _____	

8. Host government R. E. program appraisal. (List pertinent data from Worksheet #6)

Items of program weakness	Suggested action to remedy weakness	Suggested agency to initiate corrective action

9. Appraisal of operating R. E. project (if applicable). (List pertinent data from Worksheet #7)

Items of Project Weakness	Suggested Action to Remedy Weakness	Suggested Source to Initiate Corrective Action

WORKSHEET #9

SUGGESTED STRATEGY PLAN FORMATS

A. Strategy plan format for overall LDC R. E. program development

Basic Strategy Development Items	Suggested LDC Agency Responsible for Implementing Strategy	Major Constraint in Implementing Strategy	Type of Intervention Assistance Suggested to Remedy Constraint	Suggested Source to Fund Intervention	Suggested Year of Intervention
1. R. E. program administration strategy: (describe preferred administrative authority and functions to be developed)					
2. R. E. project operations strategy: (describe preferred project operation organization structure and functions to be developed)					
3. Program power supply strategy: (describe preferred power supply options to be developed)					
4. Rural development support strategy: (describe preferred supplemental development program activities to be developed)					

# Best Available Document

WORKSHEET #9

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## SUGGESTED STRATEGY PLAN FORMATS

### B. Strategy plan format for R. E. project requesting Mission assistance

Suggested Assistance Requirements	Type of Intervention Action Required	Suggested Agency or Advisor to Perform Action	Suggested Source to Fund Action	Suggested Year to Take Action
1. National legislative assistance and support: (List types of assistance or support required to make project more effective.)				
2. National power or R. E. agency assistance and support: (List types of assistance or support required to improve project operations.)				
3. Government development agency assistance and support: (List types of assistance or support required to improve project use.)				
4. Private and local assistance and support: (List types of assistance or support required to improve project financial base and maintenance services.)				
5. Independent technical assistance and support: (List types of technical assistance required to improve project practices and manpower needs.)				