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RURAL ELECTRIFICATION

PROJECT PAPER

MAY 1979

AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT IDENTIFICATION DOCUMENT FACESHEET <i>To Be Completed By Originating Office</i>		1. TRANSACTION CODE <input checked="" type="checkbox"/> A - Add <input type="checkbox"/> C - Change <input type="checkbox"/> D - Delete	PID 2. DOCUMENT CODE 1
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9. PROPOSED NEXT DOCUMENT A. <input type="checkbox"/> 2 - PRP <input type="checkbox"/> 3 - PP B. DATE <table border="1"><tr><td>MM</td><td>YY</td></tr><tr><td> </td><td> </td></tr></table>	MM	YY			10. ESTIMATED COSTS \$500 or equivalent, \$1 = FUNDING SOURCE a. AID Appropriated 58,000 b. OTHER 1. 2. c. Host Country 58,000 d. Other Donor(s) TOTAL 116,000
MM	YY				

9. ESTIMATED FY OF AUTHORIZATION/OBLIGATION a. INITIAL FY [719] b. FINAL FY [719]
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11. PROPOSED BUDGET AID APPROPRIATED FUNDS (\$500)							
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH CODE		E. FIRST FY		LIFE OF PROJECT	
		C. Grant	D. Loan	F. Grant	G. Loan	H. Grant	I. Loan
1) FN	B263		062		58,000		58,000
2)							
3)							
4)							
TOTAL					58,000		58,000

12. SECONDARY TECHNICAL CODES (maximum six codes of three positions each)

13. SPECIAL CONCERNS CODES (maximum six codes of four positions each)	14. SECONDARY PURPOSE CODE
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15. PROJECT GOAL (maximum 240 characters)

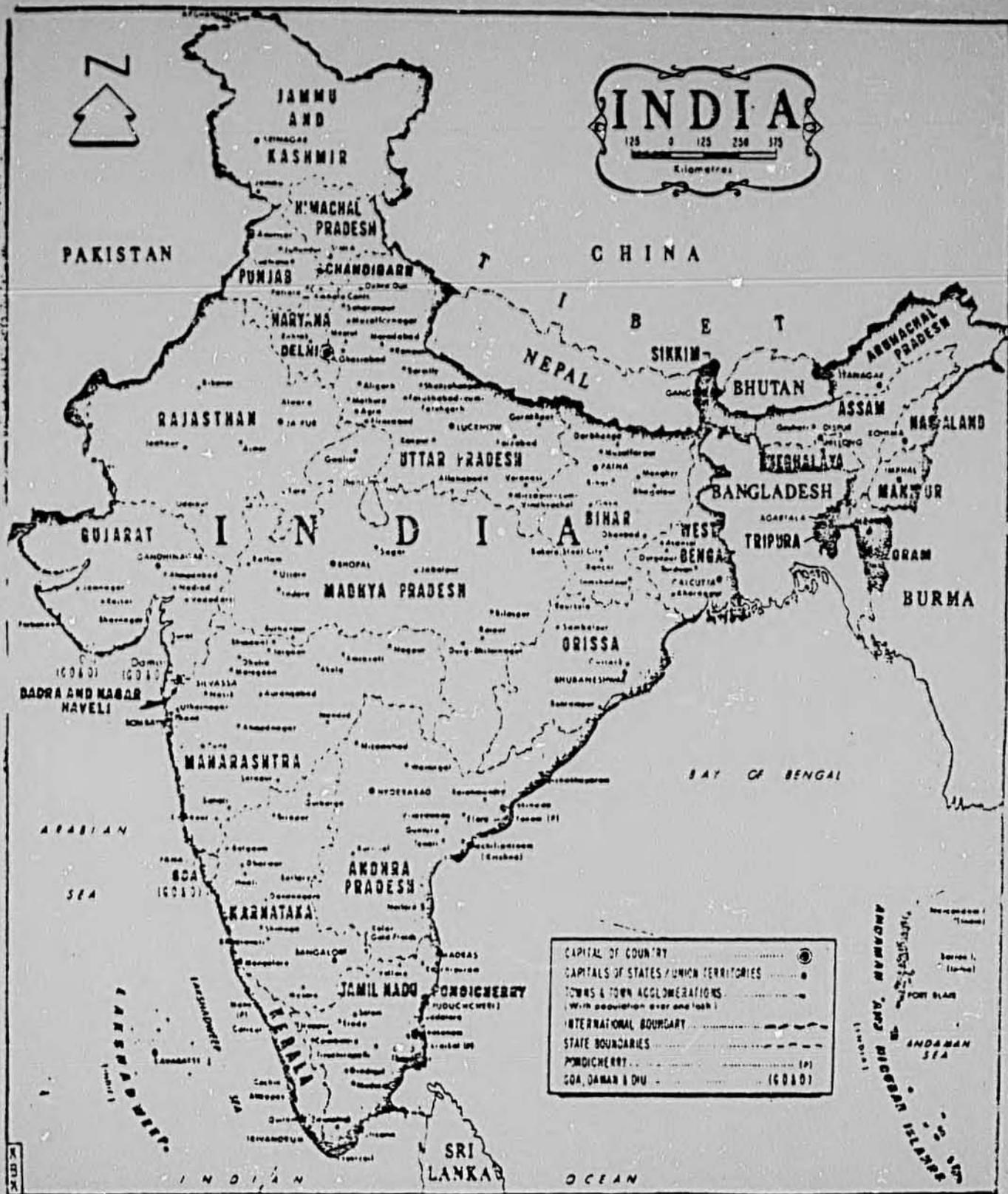
- Increase agricultural production hence income.
- Expand employment opportunities in rural areas.

16. PROJECT PURPOSE (maximum 430 characters)

Provide electrical energy for productive and social services to "backward" areas.

17. PLANNING RESOURCE REQUIREMENTS (staff, funds)

18. ORIGINATING OFFICE CLEARANCE Signature _____ Title _____	19. Date Document Received in AID/W, or the AID/W Documents, Date of Distribution Date Signed MM DD YY _____ MM DD YY _____
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Source: India 1978. The boundaries shown do not imply on the part of the U. S. Government any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

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CURRENCY EQUIVALENTS

Currency Unit	:	Rupee (Rs.)
Rs. 1	=	100 Paise
US \$ 1	=	Rs. 8.00
Rs. 1	=	US \$0.125

LIST OF ABBREVIATIONS AND ACRONYMS

ARDC	-	Agriculture Refinance and Development Corporation
CEA	-	Central Electricity Authority
GOI	-	Government of India
HT	-	High Tension
ICICI	-	Industrial Credit and Investment Corporation of India
IDBI	-	Industrial Development Bank of India
LT	-	Low Tension
MG	-	Mini-growth Scheme
MH	-	Mini-health Scheme
MNP	-	Minimum Needs Program
OA	-	Ordinary Advanced Area Scheme
OB	-	Ordinary Backward Area Scheme
OC	-	Ordinary Cooperatives
RE	-	Rural Electrification
REC	-	Rural Electrification Corporation
SEB	-	State Electricity Board
SI	-	System Improvement Scheme
SPI	-	Special Project Industry
SPA	-	Special Project Agriculture
SU	-	Specially Underdeveloped Area Scheme
kV	-	kilovolt = 1,000 volts
kVA	-	kilovolt-ampere = 1,000 volt-amperes
MVA	-	megavolt-ampere = 1,000 kilovolt-amperes
kW	-	kilowatt = 1,000 watts
MW	-	megawatt = 1,000 kilowatts
kWh	-	kilowatt-hour = 1,000 watt-hours

GOI FISCAL YEAR

April 1 - March 31

RURAL ELECTRIFICATION PROJECT LOAN

Part I. Project Summary and Recommendation

A. Recommendation

A loan is recommended to finance the foreign exchange and local costs of undertaking small-scale, area based, rural electrification projects in India. Details of the Project Loan are as follows:

1. Borrower: The Government of India (GOI)
2. Implementation Agency: The Rural Electrification Corporation Limited (REC) of the central GOI.
3. Financing:
 - a. AID Contribution: Loan of \$58 million.
 - b. AID Loan Terms: Repayment of principal and payment of interest within 40 years, including a 10-year grace period of repayment of principal, with interest of two percent (2%) per annum during the grace period and three percent (3%) thereafter.
 - c. Borrower's Contribution: \$58 million equivalent.
 - d. Total Cost: Approximately \$116 million for which AID's contribution will be provided for local financing as well as for any off-shore procurement.
 - e. Relending Terms: The Borrower will onlend the AID Loan to REC at an interest rate of 7.25% to be repaid over 20 years including a five year grace period.

B. Summary Description

1. Project Purpose

The purpose of this project is to provide electrical energy for productive and social services in "backward" areas. This purpose can be achieved by constructing area-based rural electrification projects^{1/} (sub-projects under this overall project) which have as their primary emphasis the energization of pumpsets. Achievement of this purpose will contribute to the goal of increased incomes among the farm population benefitting from sub-projects as well as to provide employment opportunities made possible through the increased labor demands required by irrigated agriculture. In addition to the inputs provided to agricultural production, electrification will provide opportunities for the expansion of small-scale industry to rural areas and will light up homes, streets, etc., thus also broadening the scope of improving the quality of life.

2. Project Strategy

The AID loan will support REC's Minimum Needs Program (MNP) and Specially Underdeveloped (SU) loan categories to focus attention on extending electrification to India's backward or disadvantaged areas. The MNP category gets its name from the larger Minimum Needs Program which includes electrification along with other sectors targeted for development in India's backward areas.

The strategy underlying the Minimum Needs Program (created in 1974) is that of balanced socio-economic development for India as a whole. The emphasis on backward regions is designed to raise the standard of living in these areas relative to the more advanced areas. The Program and this loan seek to bring about a more equitable distribution of resources and income to the poorer areas of India.^{2/}

The backward areas are generally characterized as having low agricultural productivity, high unemployment and low income levels. The GOI's objective is to remove these problems by

^{1/} Projects or sub-projects are referred to as schemes in India.

^{2/} The AID-assisted program will primarily be in the following states: Andhra Pradesh, Assam, Bihar, Gujarat, Madhya Pradesh, Orissa, Rajasthan, Uttar Pradesh and West Bengal. With the exception of Andhra Pradesh these states are well under the all-India average of electrified villages.

allocating substantial amounts of resources for stimulating economic development. The expansion of a rural roads system, the development of public drinking water supplies, and educational development form part of the Minimum Needs Program strategy.

Electricity to the backward areas is envisioned as the primary energy source for agricultural and small-scale industrial development. The benefits to be derived include increased incomes resulting from additional labor demand and greater agricultural output. The project will thus contribute to an absolute increase in income in selected areas as well as improving the relative economic well-being of poor regions.

3. The Project

The project consists of approximately 165 sub-projects/schemes which are prepared and submitted by State Electricity Boards (SEBs) to REC for its approval. A scheme is the establishment of the infrastructure for the electrification of a group of mostly contiguous villages. SEBs carry out the implementation of the approved sub-projects. Rural electrification schemes in India do not contain or plan for self-contained generating power. Power is supplied from existing thermal or hydro systems in each state. The particular schemes AID proposes financing are of two kinds: Minimum Needs Program (MNP) and Specially Underdeveloped (SU) with \$50 million (86%) earmarked for MNP schemes and the balance for SU schemes. Both types of schemes according to Indian-developed socio-economic indicators (income levels, cropping patterns, rainfall patterns, industrial development, credit facilities, existing infrastructure) are meant for areas which are economically disadvantaged. Other kinds of schemes such as Ordinary Advanced (OA) and Ordinary Backward (OB) included in REC's total portfolio will be financed on a time-slice basis by IDA which proposes an REC credit of \$175 million. It should be noted that the categories mentioned above do not necessarily reflect homogenous, socio-economic groups but are relative terms that determine REC's loan policies to SEBs for sub-project financing. Sub-projects located in economically poor areas generally receive softer loan terms than those in better-off areas.

4. Project Financing

AID assistance will be provided under this project for financing the foreign exchange and local costs of procuring electrical hardware (excluding poles^{1/}) required under each scheme. AID's contribution of \$58 million will finance the procurement costs of certain project materials^{2/} which account for approximately 50% of the total cost of an average electrification scheme. The GOI's contribution of \$58 million will finance the costs of miscellaneous materials, poles, land acquisition, civil works, salaries, overhead costs, and the transportation of materials.

Although Code 941 countries will be eligible for bidding on most items, it is anticipated that awards will be won predominantly by Indian suppliers. The use of foreign exchange for local cost financing was agreed to by the Development Coordinating Committee (DCC) in December 1977 with respect to the FY 78 and FY 79 AID programs in India. Each of these programs passed Congressional review.

5. Organization and Implementation

The Management of REC is vested in a Board of Directors which presently consists of eleven GOI-appointed members who serve on a part-time basis. The Board is headed by a full-time Chairman and Managing Director who also presides over REC's Technical and Management sections. REC's head offices are located in New Delhi and are complemented by 11 regional offices located around the country. REC has been in operation since 1969, and has gained valuable experience over the years as a financial institution also capable of extending technical expertise in scheme planning, monitoring and evaluation. To date, it has promulgated policies resulting in the standardization of project design, materials, and procurement procedures, all of which are followed by State Electricity Boards (SEBs). Actual project design and implementation are undertaken by SEBs; however, all

^{1/} Poles are manufactured by SEBs and, as such, would not lend themselves readily to a competitive bidding process.

^{2/} Insulators, meters, conductors, transformers, insulated wire, air break switches, lightning arrestors, L. T. cutouts, GI wire and cross arms.

REC-financed projects must be submitted to REC for appraisal and approval made by a qualified appraisal staff consisting of engineers, economists, and financial experts. Prior to approval all projects must be technically and financially sound according to REC's practices which are discussed in the technical and financial sections of this paper.

C. Project Development and Summary Findings

AID's project findings draw in some measure from IDA's second REC loan analyses which started in April 1978 and ended with its second and final field visit in October/November 1978. AID project development efforts consisted of the TDY services of AID/Washington electrical engineer Wilson Hodgin (coordinated with the last of the IDA visit); development of a social soundness analysis by Operations Research Group (ORG), a local research institution under a USAID/New Delhi contract; and the TDY services of USAID/Islamabad economist, Alberto Ruiz de Gamboa.

On the whole, our combined findings show that REC is a financially and technically sound institution. It has a qualified staff to undertake its various technical and administrative functions including those of project appraisal, monitoring, and evaluation.

The project satisfies all statutory criteria. The Mission has endorsed the proposed Project Loan and has certified (Annex B) that the host country is capable of maintaining and effectively using the rural electrification projects financed under this Loan. The GOI request for assistance will be provided prior to project authorization.

D. Project Issues

The principal issues raised in the PID review were (i) the extent to which the beneficiaries of rural electrification (RE) fall within the AID mandate group, (ii) the degree to which the AID target group can afford electric service - both rates and connections, and (iii) the amount of access they have to various resources and services - financing for example - that permit them to take advantage of the benefits of electricity. Below is a brief summary discussion based on the findings of an AID-financed survey which specifically addressed these issues. More detailed discussions are provided in the Social Soundness and Financial Sections of the PP.

Discussion .

The AID project is primarily assisting the Minimum Needs Program of REC which is oriented towards the economically disadvantaged areas widely acknowledged as having less than minimum levels of development as determined by the GOI.

The survey, which did not focus exclusively on the Minimum Needs Program areas, showed that a predominant number (79%) of the persons interviewed fall below an annual household income level of Rs.12,000. This is equivalent to a per capita income of \$300 (current prices) which approximates the AID definition of the poor majority. By using the Indian definition of poverty (\$100 per capita), slightly less than half of the households fall below this level. In terms of the distribution of benefits according to size of land holdings, over 50% of the agricultural consumers owned land of less than 4 hectares.

Electrical rates for agricultural consumers, the primary users of power, are heavily subsidized by the States and are low enough to provide an incentive for obtaining connections. Secondly, electrical connections are relatively low and the costs

are shared by most SEBs. (See Annex G.2 for costs on a state by state basis). Given the income levels and farm size holdings of rural electrification consumers examined in the survey, it may be concluded that existing rates and connection charges do not preclude the use of electricity by small farm holders and lower income groups.

Finally, a number of GOI-sponsored agencies are available for financially assisting small farmers for the capital input required for groundwater irrigation. These include the Small Farmer Development Agency (SFDA) and the Agricultural Refinance and Development Corporation (ARDC) working through established banks.

Part II - Detailed Project Description

A. Background

1. Overview

Rural electrification is not new to India. Unlike other countries in Asia where AID is providing assistance to develop rural electrification programs, India has a well-functioning, ongoing program with an organizational network in place both in the center and in the state governments. In order to accelerate the rural electrification program in India, and to enlarge its scope from village electrification to integrated area development, the GOI established REC in July 1969. It is an autonomous public sector organization under the control of the Ministry of Energy.

REC has adopted a project approach to investment and has established guidelines for standardizing the project appraisal and approval process. Within REC, the Evaluation and Research Division is responsible for long-range evaluation studies on project performance and their overall impact on the rural economy as a whole. REC also conducts training of REC and SEB staffs engaged in project formulation, implementation and monitoring.

The actual project design work, construction and supervision are carried out by the SEBs. REC provides assistance where necessary. REC has issued a large number of specifications and construction standards in connection with distribution lines and substations. The specifications and construction standards are being followed by all SEBs as they carry out REC's and their regular rural electrification program.

2. REC Program

REC's loan program includes a number of different loan categories which have been established for purposes of financing using socio-economic indicators. Thus, projects located in less

developed areas of the country receive softer loan terms than those in better-off areas. (See Annex E.1 and E.2 for details of different loans and their terms). The main types of loan categories are as follows: Ordinary Advanced (OA), Ordinary Backward (OB), Specially Underdeveloped (SU), and Minimum Needs Program (MNP). REC has given priority emphasis to MNP schemes to which most of AID financing will be channelled.

The loan categories are based on such indicators as income, cropping patterns, size of land holdings, credit facilities, rainfall patterns and existing infrastructure of the area to be electrified. There is no absolute, objective criteria that separate the categories. The data for these indicators are used to compare districts and states with each other and with national averages in arriving at an approximation of the area's economic status reflected in SEB scheme proposals. Upon REC's review, the scheme is assigned an appropriate category.

In addition to MNP and SU schemes, REC has in its portfolio other kinds of schemes, examples of which are contained in Annex E.1.

3. Priority and Relevance of Project

The highest priority of the Government of India in addressing the development needs of the country is to increase rural employment. Within this overall strategy to focus resources in the rural areas to generate employment, emphasis is to be given to programs which intensify agricultural production and develop small rural industries. A major mechanism to assist in implementing this strategy is the use of electrification.

4. Linkage of Project to AID Development Strategy

The USAID development strategy over the long term, as explained in the Country Development Strategy Statement (CDSS) 1980-1985, is to increase productivity, incomes, and welfare in the rural areas of India with a focus on small farmers. It is a strategy that is consistent with the GOI's Sixth Five Year Plan (1978 to 1983) which is largely production-oriented.

With this approach in mind, the GOI considers the development of the country's irrigation potential as having the highest investment priority mainly because of the production potential and employment possibilities offered by irrigation. The rural electrification program to develop groundwater irrigation together with surface irrigation is an integral part of the Plan's program. AID assistance to the REC's MNP and SU schemes representing the poorer than average sections of Indian communities is consistent with its mandate to provide resources to poor rural areas. The choice of REC is also consistent with AID's development strategy in India with regard to the transfer of resources to those institutions which have the requisite experience, staff, and infrastructure for implementing their development programs.

5. Other Donor Activity

IDA is the only other donor providing assistance to REC. IDA provided its first line of credit to the GOI for \$57 million in July 1975. The closing date for this credit is scheduled for December 1979, to be followed by a second loan of \$175 million. The IDA loan, will be oriented primarily to OA and OB schemes with some financing given to System Improvement(SI) and other special consumer schemes, two pilot projects on capacitor use and funds for the construction of REC's new training center in Hyderabad.

B. Logical Framework Narrative (See Annex F for Logical Framework Matrix)

1. Goals and Purpose

a. Goals and Assumptions

The goals of this project are to: (1) increase agricultural production and hence income in backward areas and (2) expand the opportunities for employment in rural areas. Indicators of goal achievement, verifiable through REC's records and studies are: (1) an accelerated increase of agricultural production over normal growth in scheme areas by an estimated 30%, (2) accelerated income growth somewhat higher than growth in agricultural production because of increased non-crop

agricultural activity, and (3) accelerated increases in employment opportunities from irrigated agriculture and development of small scale rural industry.

Goal achievement will depend on two key assumptions: (1) the GOI maintains price policies favorable to farmers and (2) changed production practices are labor-demanding rather than labor displacing. With regard to the former, the GOI has in the recent past promulgated input/output price policies that have been favorable to farmers and just recently in its current 1979/1980 budget has further provided subsidies for such inputs as fertilizer in keeping with its policy orientation to small and marginal farmers. With respect to the latter assumption, farmers who engage in intensive cultivation as a result of irrigation are not likely to shift dramatically from labor intensive to capital intensive methods of agricultural production. The size of most farmer plots are conducive to labor intensive methods.

b. Project Purpose and End of Project Status (EOPs)

The purpose of the project is to provide electrical energy for productive and social services in "backward" rural areas. At the end of the project period, June 30, 1983, it is anticipated that in MNP and SU areas some 17,000 villages^{1/} will be electrified and these would include 50,000 pumpsets energized, 241,000 domestic connections, 7,000 commercial connections, 30,000 street lights provided and 3,000 industrial connections. The figures reflect estimates of the number of connections that would be in place for an "average" or representative rural electrification project at the end of the project period. The precise number of connections will vary with the number of projects that are actually implemented. REC and SEB project records will be available to verify progress towards purpose achievement.

c. Purpose-Goal Linkage

The principal assumptions affecting this linkage are:
(1) farmers willing to use electrical energy for irrigation,

^{1/} A village is defined as being electrified if it contains at least one connection, although most electrified villages usually have several.

(2) pumpsets priced at reasonable rates, (3) consumer energy rates affordable, and (4) credit is available at affordable rates for agricultural inputs such as pumpsets. With the gradual expansion of electricity to rural areas, farmer awareness of the economic benefits of electrification has developed. Diesel pumpset owners are equally aware of the cost savings involved in electrical energy systems and are readily willing to make conversions.^{1/} Farmers operating traditional lift systems (bullock power for example) easily accept the concept of electrical energy and if provided with sufficient financial incentives will make pumpset purchases. Because electrical pumpsets are not only lower in price than diesel-operated systems, and also cheaper to run, they are a better buy than diesel pumpsets. Financing is available from institutional sources -- commercial banks linked to special concessional programs under ARDC. Energy rates in India as a whole, particularly for agricultural users are by any standard reasonable, varying from a low of 1 cent (12 paisa) in the Punjab to a high of 4 cents (32 paisa) per kilowatt/hour (kwh) in West Bengal (See Annex G.1 for state by state rates for different consumers).

2. Project Outputs

The project consists of approximately 165 sub-projects with the necessary infrastructure for extending electrification to rural areas. Approximately 140 sub-projects will be confined to MNP areas and 25 to SU areas. REC classifies a project as being eligible for MNP loans if the project is located in a state which is less than 50% electrified. In all other socio-economic respects, MNP and SU schemes are virtually the same.

3. Outputs to Purpose Linkage

The output to purpose linkage is largely dependent on two key assumptions: (1) an adequate number of feasible

I/ A survey conducted as part of the project's Social Soundness Analysis corroborates this phenomenon.

sub-projects can be identified and (2) SEB technical, organizational and management capability adequate for implementing sub-projects. There is support for the first assumption in view of REC's very large loan portfolio which has a sizeable share devoted to financing MNP and SU projects. As far as SEB capability is concerned, implementation efficiency varies with each SEB. Bottlenecks such as construction delays and the timely availability of materials are encountered. Organizational and management constraints add to these. However, REC has recommended corrective measures be taken, and through its computer-oriented monitoring program it is able to spot implementation problems quickly and recommend practical solutions.

PART III. Project Analysis

A. Technical Analysis

1. Technical Description

Rural electrification systems in India involve 11 KV primary (H. T.), 415/240 volt secondary (L. T.) lines, distribution transformer installations, service wires and meters. Supply is provided from 132 KV/11 KV, 66 KV/11 KV, or 33 KV/11 KV substations. The 11 KV primary distribution lines are 3 phase, 3 wire with all poles grounded. Distribution transformers (11 KV/415-240 volts) are 3 phase which reduce voltage from 11 KV to 415 volts between phases and 240 volts between each phase and neutral. The 415/240 volt secondary distribution lines are generally 3 phase, 4 wire, etc. depending on existing load in the area. System frequency is 50 hertz (cycles).

Each State Electricity Board (SEB) is responsible for the generation, transmission and distribution of electricity within the state. Each SEB has its own program of rural electrification in addition to the schemes supported by REC. Schemes prepared by the SEB and presented to REC for financing cover most villages in defined geographic areas of an SEB district. A scheme may include a number of different non-contiguous areas within a district which areas are grouped together for project identification purposes. Most villages within the areas of the scheme are included in the electrification plan. Those villages omitted may already have service or may be considered unlikely to take service because of the absence of irrigation wells in the village. A mandatory requirement for any scheme presented to the REC is that there must be groundwater available for pump irrigation. A certificate from the State Groundwater Development Board must be presented stating the groundwater potential and quality of water to support pump irrigation in the proposed scheme. Schemes are planned to electrify each village and the number of connections in the scheme within a 3-5 year period. The maximum size of each scheme is about \$1 million (Rs. 7.5-8 million).

Plans and accomplishments are stated in terms of villages electrified, additional acreage to come under cultivation, number of connections by category and connected KW load. The village is a geographic area which may vary in size from 1/2 mile to 10 square miles. There may be more than one house or cluster of establishments in each village and irrigation wells are dispersed throughout the cultivable areas of the village.

2. Power Supply

Power development has been significant in the Indian economy during the last three decades. During this period substantial generating capacity, transmission and distribution systems have been developed. The total installed generating capacity has grown from 2,300 MW in 1950 to almost 24,000 MW (excluding 2,200 MW for non-utility capacity) in 1978. Largely as a result of present deficits, significant increases are planned for the current five year plan which calls for 42,000 MW by 1983. However, until this goal is realized, short-term deficits will remain.

The extension of electricity to rural areas creates new demands on the existing generating capacity. However, the added demand on the system created by the rural electrification program is relatively small compared to the total demand in the country. Nevertheless service is provided by rationing power through load shedding. Despite this situation, priority service is given to the agricultural sector from October to March when season demand is highest.

Net power available to rural electrification systems is also affected by power losses in the transmission and distribution system. Such losses are estimated at 25% of power generated. In order to minimize the effect of further losses, SEBs are undertaking System Improvement (SI) schemes with financing from REC. (IDA has proposed financial assistance to REC for the SI program. See section 5.6 below for a discussion of the salient features of this program.)

3. Design & Construction

Load estimates are made in each village tabulating the expected number of irrigation pumps, small industry, household/commercial, street lighting and other services at the end of a project period, [lasting anywhere between three to five years]. Growth beyond the project

period is forecast through the 25th year in terms of the number of connections, facilities in place, power demand and energy consumption of connected consumers. System design provides capacity for the project period load estimates plus seven years growth.

Engineering design and line layouts are made by SEBs which carry out construction activities on a force account basis.^{1/} Because the designs do not require capacity for rapid load growth, relatively small size conductors have been adopted as standard.

At its initiative, REC has issued material and construction standards which have been adopted by all SEBs for their rural electrification schemes. In the preparation of these standards, REC has been guided by the practices followed in other countries and by guidelines from the Indian Standards Institute. The costs of material, construction and maintenance have been reduced considerably as a result of standardization. For example, the cost of a pole which was \$50 in the past has now been reduced by two thirds to \$16. The construction of rural electrification schemes has also become uniform throughout the country. There are 11 basic specifications and 85 construction standards which have been compiled in 14 REC manuals. Additional specifications and manuals, including a planning guide, are in preparation.

During AID/Washington ASIA/PD engineer's TDY, several sample schemes of differing type were visited. In the limited time available he was able to note in his report (which forms part of this analysis) that the quality of 11 KV and 415/230 volt lines and distribution transformer installations observed were generally good although, as the report mentions, there were the usual deviations attributed to the lack of materials available. Based on discussions with REC officials as well as with the World Bank's distribution engineering consultant, the report concludes that SEBs are able to perform the engineering and construction of rural electrification projects satisfactorily.

4. Project Cost Estimates

Overall project cost estimates are based on the costs of an average scheme as indicated below. Material costs of a scheme

^{1/} Construction consists primarily of digging pole holes, installing poles and stringing lines.

are based on unit costs which are generally the same from state to state. A 15% inflation factor has been built in to each of the cost elements.

MNP/SU SCHEME^{1/}

<u>Item</u>	(000) <u>\$ equiv,</u>	<u>% of Total</u>
1. *Conductors and cables	235,972	33.7
2. *Transformers	32,910	4.7
3. *Insulators	18,205	2.6
4. *Meters ^{2/}	14,004	2.0
5. *Other Items ^{3/}	49,015	7.0
6. Miscellaneous Items	61,619	8.8
7. Civil Works	29,409	4.2
8. Poles	<u>103,632</u>	<u>14.8</u>
Sub-Total	544,766	77.8
9. Contingency (3% of sub-total)	16,343	2.33
10. Overhead ^{4/} (6% of sub-total)	32,686	4.67
11. Labor	73,522	10.5
12. Transportation	<u>32,910</u>	<u>4.7</u>
Total	<u>700,227</u>	<u>100.0</u>

- 1/ See Annex 'I' for a detailed spread sheet of items, quantities and costs for an MNP scheme approaching the maximum amount REC will finance.
- 2/ Air break switches, lightning arrestors, G.I. wire, cross arms, L.T. cutouts, and insulated wire.
- 3/ U clamps, danger boards, binding wire, jointing sleeves, nuts and bolts, etc.
- 4/ Includes indirect costs as tools and construction machinery, rental of storage space and administrative costs.
- * USAID financing proposed for Items 1, 2, 3, 4 and 5 is 50% of the total cost. These figures are based on average scheme costs and the estimates may vary \pm 3%.

5. Technical Operations

a. System Losses

System losses in India are relatively high, estimated at about 25% of net generation as compared to 10-12% considered acceptable. Contributing factors to the high losses in India tend to be:

- (1) agricultural loads spread over wide areas requiring long transmission and distribution lines resulting in high line losses;
- (2) the tendency among pumpset owners to use higher capacity pumps than required causing system overload;
- (3) the use of non-standard motors having power factor ratings less than the specified standard resulting in excessive current demands; and
- (4) the theft of power.

b. Systems Improvement

To correct the above-mentioned shortcomings (with the exception of theft), REC has been providing loan assistance to SEBs for Systems Improvement (SI) schemes. This type of assistance that evolved from REC-conducted studies show how modest investments in system improvements can minimize losses as well as recover revenues for SEBs that would otherwise have been lost. Improvements are made by increasing the size of 11 KV H. T. conductors, increasing the number of sub-stations and distribution lines, and by using capacitors that increase power factors of motors.

Another loan category somewhat related to SI loans is the LT loan for LT capacitors. Under such a loan, SEBs can purchase LT capacitors at low bulk prices for the benefit of their consumers. LT capacitors help to increase the power factor on consumer motors and thereby reduce system losses.

As a measure of REC's commitment and interest in financing system improvement projects, it has approved in the last two years (1977/78, 1978/79) 110 SI projects for a total value of \$82.5 million and 33 LT capacitor projects amounting to \$8.75 million in 1977-78. It is estimated that the SI projects alone will result in an annual energy savings of 251 million units.

6. Conclusion

Based on the above, the project is considered technically sound and meets the requirements of FAA 611 (a).

B. Financial Analysis and Plan

1. Background

The Rural Electrification Corporation (REC) was established in 1969 as a result of the recommendation of the All India Rural Credit Review Committee. The recommendation was made on the one hand in response to agricultural policy to develop groundwater irrigation potential by electrifying pumpsets and on the other in support of State Electricity Boards (SEBs) which were poor in the required financial resources for electrification to rural areas. For fulfilling its role, a special fund, upon the recommendation of this committee, ^{1/} was created with a USAID grant of Rs. 1,050 million (\$131.25 million) ^{2/} matched by a GOI contribution.

2. Financial Status of REC

As of March 31, 1978, REC's total capital base amounted to \$665 million (Rs. 5,317 million) made up of GOI owned share capital (\$84 million), GOI loans (\$377 million), REC bonds (\$52 million) and Reserve and Surplus (\$152 million). The GOI lends to REC at varying interest rates (5.5% to 8.0%) and these funds are in turn on-lent to SEBs for the financing of REC-approved projects also at varying rates. State Governments guarantee repayment of REC loans to SEBs. Revenues in 1978 amounted to \$31 million. These are derived from the interest on REC loans to SEBs and investment returns of surplus cash and are used for administrative expenses and for interest payments on GOI loans and on bonds issued. REC's loan and investment portfolio are satisfactory and are without arrears problems.

Thus far, REC has disbursed approximately \$629 million against a total commitment of \$1.04 billion. From its retained savings, REC has created a Special Development Reserve fund (\$7.4 million) which is used to grant finance research and development efforts

^{1/} Using an exchange rate of \$1.00 equals Rs. 8.00.

^{2/} The grant was made subject to the condition that up to \$50.25 million equivalent (Rs. 450 million) would be made available to REC by the GOI in the form of equity or loans on a matching basis of 70% USAID Grant funds to 30% GOI funds.

related to electrification, provide loan assistance to State Governments to purchase shares in rural electric cooperatives, and for other development activities. REC's current debt of \$429 million amounts to 65% of its capital base. While the debt/equity ratio is expected to increase over the next five years, it is expected to remain acceptable. (Full details of REC's financial status are contained in Annex H).

3. Financial Viability of State Electricity Boards (SEBs)

Section 59 of the Electricity (Supply) Act of 1948 provides that SEBs shall not, as far as possible, carry out their operations at a loss. In actual practice, however, many SEBs do suffer losses for some of the following reasons:

- (1) poor generation;
- (2) high system losses including theft;
- (3) operational inefficiency and high overhead costs;
- (4) delays in the start of new projects for generation; and
- (5) low consumer, particularly agricultural, rates established by State Governments.

Rural electrification projects, because of their low returns in their initial years of operations, also add a financial burden to the SEBs. In view of this last fact as well as the financial uncertainty of some SEBs, AID (in following IDA's example) will provide financing to REC on the condition that funds are on-lent to financially viable SEBs, that is, to those SEBs that show a 9.5% rate of return^{1/} or to SEBs whose^{2/} state governments are willing to subsidize losses up to this level.^{2/}

^{1/} The annual rate of return for any financial year is calculated by taking operating income as a percentage of the average of the capital base at the beginning and end of the particular financial year.

^{2/} These states are: Andhra Pradesh, Assam, Bihar, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Uttar Pradesh and West Bengal.

With regard to making the SEBs more viable financial units than they presently are, a number of measures have been proposed under the present five year plan (1978-1983) to address the above mentioned problems. For example, a high level expert committee under GOI auspices is being constituted to examine services related to electricity rates with a view to making recommendations that would bring consumer rates in line with the costs in providing service to them.

Apart from the rate issue, other proposals have been made to overhaul and streamline the management of SEBs in order to increase their operational efficiency. Steps will be taken to make SEB management functionally oriented, i.e. with specialization of function: in generation (thermal and hydro), transmission and distribution, load despatch, just to name a few specialties. GOI attention will also be given to examine ways to reduce construction time in the implementation of thermal and hydro-electric projects, and two expert committees have been constituted for this purpose.

4. REC's lending terms and financial criteria for loans

To qualify for REC financial assistance, projects are required to achieve a stipulated net return on project investment after meeting operating and maintenance costs at the end of five, seven, ten, fifteen, twenty, and twenty-five year intervals. Interest rates vary over the life of a loan with terms being softer in the early years and gradually increasing to a high of 11%, the reasoning being that the borrower should be able to afford higher rates as the project matures.

After loan execution, funds for the first year's project requirements are released; subsequent releases are made depending on project progress. Interest is payable every six months beginning with the

financial year after loan approval. Repayment of principal begins after a five year grace period and is made in equal annual instalments.

5. Financial Viability of RE Schemes

REC appraises and approves the various RE schemes submitted to it for assistance by SEBs on the basis that schemes which reach the break-even point (revenues equal to cost of energy and specific operation, maintenance and depreciation costs) after periods of 5-15 years and which maintain minimum rates of return on cumulative investment subsequently qualify for financing (Annex E.2). For MNP and SU schemes the break-even point is 15 years with a 3-1/2% net return on investment at the end of the 25th year.

An analysis of a sample of REC approved schemes was undertaken by World Bank as part of the preparation of the second IDA credit. Costs and revenues presented in REC appraisals were discounted at 7% (average interest rate at which funds were available to SEBs) and internal rates and net present values determined. The results of the analysis are twofold: (1) there are no generalized rates of return applicable to REC schemes. Each must be approached on an individual basis due to disparities in costs, tariffs, existing infrastructure, and load development; (2) rates of return range from no positive rate to 79%. MNP and SU schemes in this sampling showed a 4% internal rate of return.

As may be expected, MNP and SU schemes fall in the low range of the financial return scale due mainly to extremely low tariffs, particularly in the agriculture sector, larger capital investments because of the relative remoteness of these schemes and lower growth of demand resulting from the more backward economic and social conditions. While at the time of sanctioning by REC, the schemes must meet the established financial criteria based on project preparation activities, analyses of the World Bank's sample schemes also indicate that some MNP and SU schemes may yield a negative net present value at a 7% discounted cash flow basis.

Nevertheless, these schemes as indicated in the Economic Analysis Section provide a satisfactory economic return to the economy and directly attempt to meet the social and distribution objectives of the GOI and AID. Losses are being offset by a combination of direct subsidization by State Governments and cross subsidization from other SEB consumers to RE consumers. This subsidy policy is supportable both in light of the target group being served and the program objective of supporting the productive and employment effort of accelerated irrigated agricultural development.

6. Rate Structure

a. Cost of Energy to Consumers

As indicated earlier under section 3 above, agricultural rates are highly subsidized. The importance most states attach to agricultural production and its employment generation potential, are the main reasons that explain the low agricultural rates. Small industrial users are given the next favorable rates in keeping with policies to provide incentives for small-scale rural industries as a means of employment generation. Commercial and domestic users pay the highest rates in that order subsidizing in effect the lower rates charged to other customers. (Annex G.1 shows the charges per consumer category by state).

The central GOI, REC and SEBs are aware of the problems inherent in uniformly low rates, and a number of reforms have been proposed as solutions. Chief among these of course is the proposal that rates should be based on a rational calculation of the costs (generation, transmission, distribution, administrative, etc.) in providing electricity to different consumer groups. Other proposals recommend the use of peak and off peak rates to correspond to demand and rates that are based on the quality of service with lower rates being charged to customers who don't require an assured supply of power.

Rate reform will be a gradual, slow process since rates are a state-related issue having well known social and political implications, and continue to receive close attention and strong support from agricultural groups. Furthermore, as long as development progress rests with a dominant agricultural sector, and national and state government pursue a policy oriented to making small and marginal farmers economically viable, dramatic changes in the rate structure are not likely to occur in the next few years.^{1/}

b. Metered vs Flat Charges

The flat charge approach is preferable in many states lacking in adequate infrastructure and/or staff for meter reading.^{2/} The added administrative costs and inefficiencies associated with meters argue for a different approach. A flat charge approach easily overcomes the inevitable problems of the servicing of defective meters, theft and the potential for corruption, problems which many SEBs are ill-equipped to solve.

c. Electrical Connections

The cost of connections, of whatever kind, and the share borne by the consumer varies from state to state in India. For example, out of a total cost of \$28.75, the agricultural consumers in Uttar Pradesh state pay approximately \$11.25, the lowest of any state, whereas in Assam, the only state where the customer pays the entire cost, the charge is \$155, one of the highest in India. However,

^{1/} In her paper "Infrastructure Projects: Rural Electrification" Judith Tendler makes a strong case in defence of low agricultural rates for rural electrification projects (as in India's case) that have a productive emphasis which would increase employment prospects. She also argues that given the frequency of interrupted service, characteristic of many RE projects world-wide, the likelihood of the well-off farmer consuming a disproportionate share of electricity tends to diminish somewhat.

^{2/} Tendler also discusses the metered vs. flat charge issue and concludes that flat charges are applicable in certain rural settings where distances are far, transportation lacking, etc. thus making metered readings administratively impractical if not costly.

in most states the costs of the connection is generally shared by the SEBs and consumers. (See Annex G.2 for connection charges by State).

7. Summary Cost Estimates and Financial Plan
(U.S. \$ 000)

<u>Source</u>	<u>AID</u> <u>LC</u>	<u>GOI</u> <u>LC(equiv)</u>	<u>Total</u> <u>LC</u>
1. MNP Schemes	43,500	43,500	87,000
2. SU Schemes	7,000	7,000	14,000
3. Inflation at 15% contingency	7,500	7,500	15,000
Total	58,000	58,000	116,000

8. REC Sixth Plan Budget Allocation

<u>Program</u>	<u>1978-79</u>	<u>1979-80</u>	<u>1980-81</u>	<u>1981-82</u>	<u>1982-83</u>	<u>Total</u>
	(in millions of \$)					
MNP	61.7	65.0	61.2	62.5	62.5	312.9
Other	<u>135.1</u>	<u>165.0</u>	<u>162.5</u>	<u>200.0</u>	<u>225.0</u>	<u>387.6</u> ^{1/}
	196.8	230.0	223.7	262.5	287.5	1,200.5

^{1/} This does not include budget allocations for Systems Improvement Schemes for 1980-81 through 1982-83 for which REC has requested an additional \$250 million.

C. Institutional Analysis

1. Overview

REC as a financial institution also has the responsibility of ensuring that the projects it finances not only meet technical and financial viability criteria but are also coordinated with other rural development programs. Before approving funds for individual schemes, REC carries out an appraisal to confirm the availability of groundwater, the willingness of farmers to invest in irrigation (well, pumpset and pumpset installation), the availability of institutional credit facilities to the farmer, the availability of fertilizer and seeds, and the potential for the types of crops to be grown. REC also considers growth potential for a particular type of industry, and availability of entrepreneurial abilities, credit facilities and markets for finished products. The development of Rural Electric Cooperatives is a part of REC's operations also.

2. Management and Organization

a. Management

REC is managed by a Board of Directors which must consist of not less than three, and not more than twelve members, all of whom are appointed by the GOI. The Board has a full-time Chairman, and Managing Director, a full-time Technical Director, and nine part-time Directors.

b. Organization and Staff

The Chairman and Managing Director is the Chief Executive Officer in charge of the technical and administrative operations. The Administrative Section contains five divisions each headed by a chief. The principal divisions are: (1) Project Appraisal and Monitoring, (2) Cooperatives, Organization, Planning and Training, (3) Research and Evaluation, (4) Consultancy Service, and (5) a Financial Division. The Technical Director is responsible for four divisions, each having a specialized function that in addition also supports various regional offices throughout the country. (See Annex A for an Organizational Chart and functions).

Most of the officers and staff are recruited from Central and State Government Departments, State Electricity Boards, the Reserve Bank of India and other such institutions. Engineers who staff the technical divisions are seconded from the SEBs and the Central Electricity Authority (CEA). Other professional staff include economists, geo-hydrologists, regional planners, and statisticians holding Master's degrees or Doctorates.

To help SEBs in project formulation and also for project monitoring, REC has established and staffed eleven regional offices located around the country. Each regional office is headed by a Chief Engineer responsible for appraisal and monitoring of the projects in his region.

3. Project Development and Evaluation

a. Project Design and Approval

Each REC-approved project is designed with the following factors in mind:

- (1) the area to be electrified should be geographically contiguous as far as possible and has the requisite potential for agricultural and agro-industrial development;
- (2) the project should be coordinated with other agricultural production programs whose special emphasis is on pumpset energization;
- (3) the project should be technically sound, economically and financially viable;
- (4) the project should satisfy criteria for the type of loan applied;
- (5) the project should be administratively feasible and reasonable in costs;
- (6) adequate groundwater supply should be available; and
- (7) the project's load growth should be estimated on a rational basis.

With regard to groundwater availability and quality, REC insists that it be provided with a certificate from a competent technical authority such as the State Groundwater Organization prior to project approval. REC's Groundwater Unit is composed of two specialists who, when necessary visit project areas for an independent check of data used and of the functioning and technical capability of the State Groundwater Organization.

b. Evaluation

The Research and Evaluation Unit is faced with the enormous task of evaluating the economic and social impact of REC's nation-wide program. In response to this challenge, the Research and Evaluation Unit has sponsored a number of studies that examine the overall socio-economic impact of electrification of villages. However, because of the complexities inherent in a diverse nation such as India, and because of the many aspects (economic, financial, technical) involved in any project, evaluation studies are limited in focus both in geographic scope and subject matter. Socio-economic studies are receiving greater attention from REC today than was true in the past when it tended to emphasize studies dealing with technical implementation bottlenecks. At present, a year-long study is underway to determine the effects (both direct and indirect) of electrification on employment. Since the Research and Evaluation Unit does not have a large staff at its disposal, REC generally undertakes evaluation studies on a contract basis either through private consultant groups or with autonomous semi-governmental research institutes or through universities. While the evaluations have varied in analytical quality, REC acknowledges that the services rendered have generally been of a high calibre. (See Section IV.D for a more detailed discussion of REC's evaluation functions).

4. Coordination with other Development Programs

Planning for RE and coordinating it with the work of other agencies involved in rural development is conducted at several levels within each State. Coordination takes place at the district level in regular meetings between the concerned institutions under the chairmanship of the District Collector, the highest ranking district administrative official. In the past, this system has been operated with varying degrees of success, but a general improvement is evident in the increasing interdependence of the activities of SEBs, REC, ARDC, banks, agricultural departments, and industrial departments.

ARDC schemes are concerned with the energization of agricultural pumps exclusively, both for ARDC minor irrigation projects and independently of these. Recent agreements have been made between REC, ARDC, and the commercial banking sector for joint financing - one third each - of a number of new irrigation pump connection schemes. REC provides long-term financing, the banks short-term, and ARDC on refinancing the banks.

5. Rural Electric Cooperatives

On the basis of the U.S.'s National Rural Electric Cooperative Association feasibility study, five pilot cooperatives in five different states were established. In January 1970 REC began its support of these cooperatives with a loan of \$12,500 (Rs.100,000) to each of them. Subsequent loans totalling \$17.65 million (Rs.141.2 million) were approved. The five cooperatives began operation between October 1970 and March 1971, with implementation phased over a period of five to eight years.

For the purpose of helping to make policy decisions regarding the establishment of new cooperatives, REC formed a special committee in 1972 to evaluate the role and performance of the five pilot cooperatives. The committee's main conclusions supported the concept of cooperatives as grass roots development entities, but it made a number of recommendations to correct problems regarding the financial viability, management and administration and the organizational and rate structure of the cooperatives studied. With these key points in mind and the overall recommendation to spread the cooperative program, REC subsequently approved seven more cooperative projects.

6. Training

On-the-job training is provided within REC, and training programs, seminars etc. both in India and overseas are sponsored. To improve project management and design, REC provides training courses in project formulation and appraisal for middle level executives of the SEBs and State Departments. Training headquarters are located in Hyderabad in a temporary center. Under its second credit IDA plans

about \$1 million for financing the construction of a new center. Apart from the training of its professionals, REC has also provided a great deal of advice to SEBs in curriculum formulation for the training of linemen and their assistants, the lowest echelon worker on a scheme. Financial assistance is available under a Special Loan (SL) for the establishment of centers for such training.

7. Technical Coordination - Standardization

REC has taken a leading role in the standardization of equipment and construction practices and it has created a special unit just for this purpose. REC periodically organizes technical conferences on standardization for SEBs and their technical staffs and for representatives from such bodies as the Indian Standards Institution. Specifications which considerably reduce the variety of materials used for transformers, conductors, insulators and insulator fittings have been issued. These specifications, which cover a substantial portion of the cost of RE schemes, have resulted in lower costs of equipment, reduced inventories, shorter delivery periods and speedier project implementation.

8. Relationship to SEBs

REC has consistently taken an interest in SEBs' organizational capability to manage rural electrification projects. The SEBs' existing organizational structures were generally adequate in the initial stages of the RE program, but the increased rate of RE development has made SEBs aware of the need to allocate separate staff for preparing, processing and implementing REC-financed schemes. Primarily as a result of REC's initiative, SEBs now have separate rural electrification cells for implementing REC-backed projects.

On subjects such as project formulation, appraisal, construction and monitoring, there is a continuous dialogue between REC and SEB officers. In several instances, REC has conducted workshops to develop project formulation skills among SEB officials.

As an indication of its interest in the effective management of rural electrification schemes, REC has been instrumental in SEB adoption of standardized construction practices and equipment specifications. In the final analysis, however, since SEBs are independent statutory bodies, REC's overall influence in their affairs is limited only to the schemes it finances.

9. Performance to Date

a. Physical Achievements

Under REC schemes alone, 320,000 electric irrigation pumps had been connected by March 1978. This represented about 10% of all pumps connected by that time. Over the next five years, REC is to be responsible for 65% of all new pumps. In terms of villages electrified, REC's share stands at 23%.

b. SEB Implementation

Until recently the achievement of targets set for annual consumer connections was only about 60% of projections in an REC-financed scheme. Since 1974, overall connections have been reaching 73% and particularly for pump connections it is even higher at 83% of projections. Overly optimistic forecasts, construction delays, shortages of raw materials for the manufacture of hardware items were some of the principal reasons that led to less than optimum target achievement in the past. REC's monitoring functions which include the scrutiny of revenue growth as well as the physical progress of schemes will help to further improve implementation performance. The GOI is taking steps to ensure a steady supply of raw materials, particularly aluminium, from domestic and foreign sources to avert future problems of a shortage.

D. Project Economic Analysis

The project's economic costs are measured and expressed in monetary terms, and include not only the cost to the individuals (e.g. housewiring) and government agencies that are directly associated with the construction and operation of the project, but rather all of the costs that have to be incurred to produce the intended benefits.

Project economic benefits are defined relative to their effect on the fundamental objectives of the economy, namely development of the rural sector, and capital and foreign exchange savings. This economic analysis has quantified only those benefits that can realistically be valued in monetary terms and for which base line data are available.

The benefits amenable to quantification are:

- the economic savings of using electricity rather than diesel oil for powering tubewells, flour mills, rice mills, oil expellers, saw mills; etc.
- the economic savings of using electricity rather than kerosene for lighting.

The economic lifetime of equipment and facilities has been determined as 30 years based on engineering estimates for these type of projects.

The internal economic rate of return to the project is 11.3 percent which approximates the opportunity cost of capital in India.

On the basis of this economic analysis, the project is suitable for AID loan financing.

2. Methodology

The essence of this economic analysis is based on the cost savings attributed to electrification.

The value of costs and benefits have been appropriately discounted over time to yield a present value.

Project costs have not been increased for general price inflation because the same increase would apply to the evaluation of the benefits, leaving the ratio between them unchanged.

The exchange rate of U.S. \$1.00 = Rs.8 has been used throughout the analysis.

The analysis' estimates of such magnitude as (i) people per household, (ii) households per village, (iii) villages per scheme, (iv) connections per village, (v) share of connections per village, and (vi) costs and benefits, are derived from REC monitoring and appraisal reports and documents on statistical data pertaining to the Indian economy.

The average number of people living in an Indian household is 5, and the average number of households in a village is 90, thus, the average village will consist of approximately 450 people. The average MNP/SU scheme consists of 100 villages, with a total population of about 45,000 people. REC reports show that the average number of connections per MNP/SU scheme at the end of the fifth year is 2,000, and investment costs per connection during the first 5 years is about Rs.2,800 (U.S. \$350). Thus, total investment costs of an MNP/SU is approximately Rs.5.6 million (U.S. \$700 thousand). Since the project envisions a GOI/AID contribution of Rs. 928 million (about U.S. \$116 million) the project would finance approximately 165 schemes comprising 17,000 villages with a total population of about 7.5 million people.

3. Shadow Pricing

For purposes of true valuation of costs and benefits in economic terms, shadow conversion factors applicable to individual items were assumed where possible.

(i) SEB Investment: Border prices for major items such as conductors and transformers were identified. Other cost components were revalued in terms of border prices by using a standard

conversion factor of 0.87. Unskilled labor was valued at 75% of the market wage. The weighted conversion factor for this cost item is 0.96.

(ii) SEB Operating and Maintenance Cost: The assumption of 80% labor and 20% materials content (valued at the shadow wage rate and using standard conversion factor) yields a weighted conversion factor of 0.70.

(iii) Private Cost Saving: Private investment and the cost of diesel fuel and lubricant were valued at border prices, the remaining comparative cost items were converted to border prices by using the standard conversion factor and the shadow/market wage ratio for rural unskilled labor (0.5). The weighted conversion factor is 0.88.

4. Energy Sales Forecast

Energy sale projections were disaggregated by class of consumers. Forecasts for energy sales for residential, agricultural, commercial, industrial, and street lights through year 30. The volume of sales was based on the number of households, irrigation pumps, commercial shops, industrial units, and street lights in each village.

Since REC reports show that by the end of the fifth year the average number of connections per MNP/SU is 2,000, and the analysis estimates financing of 165 schemes, the project contemplates a total of 330,000 connections during the first five years.

The analysis identifies five major categories of consumers of electric power. Based on REC reports, connections are distributed as follows:

(a) domestic	:	73%
(b) agricultural	:	15%
(c) commercial	:	2%
(d) industrial	:	1%
(e) street lights	:	9%

Phasing of connections is also derived from REC reports. The analysis assumes that during the first year, the project will meet 5 percent of projected connections (16,500). During the second year, the project envisions electrifying an additional 10 percent of potential consumers. On the third year, 25% or 82,500, and on the fourth and fifth years, 30% or 99,000 connections each year.

After the fifth year, the analysis assumes different growth rates in connections and energy consumption for each category of consumers. A common characteristic is that after year 15, no additional connections are assumed. The annual growth rate between year 5 and 15 is 5%.

It should be noted that these are extremely conservative forecasts. Typically, the annual rate of growth of demand in rural areas is between 10 percent and 20 percent (Rural Electrification, World Bank Paper, October 1975). Moreover, even though literature research indicates that in rural areas average levels of consumption are around 1,000 kilowatt-hours per consumer per year, in our forecast, neither domestic consumers nor commercial consumers reach one-half of that consumption level by year 30. Finally because of lack of adequate data, no attempt was made to forecast power demand growth in public services (such as healthcare facilities, educational institutions, government buildings, etc.)

5. Project Costs

All the resources, both physical and human, that will go into the construction and operation of the project, have been identified and quantified. In this analysis, the relevant costs are not the financial costs of generating, expanding, and operating the systems to meet the demand, but the incremental costs to the economy.

Investment cost per connection in a typical MNP/SU scheme is estimated at Rs.2,800 (U. S. \$350) during the first five years. Additional investment cost beyond the first five year is Rs.150 (U. S. \$13.75) per connection. Operating and maintenance

costs (O&M) are estimated at 3 percent of cumulative investment cost. The marginal cost of power, including distribution losses is estimated at Rs.0.70 (U.S. \$0.9) per KWH. The figure includes the calculation of future investment cost required to produce additional power necessary to obtain the benefits for the project.

6. Project Benefits

Project benefits consist of the following components:

- The costs saved by using electricity rather than kerosene for lighting.
- The economic savings of using electricity rather than diesel oil for powering tubewells, flour mills, saw mills, oil expellers, etc.

a. Domestic Consumers - Kerosene vs Electricity

Indirect benefits to domestic consumers are confined to the cost saved by not using kerosene for lighting. From such savings were deducted fixed and running costs of wiring, fixtures, and light-bulbs.

Evaluations show that for the typical Indian rural family, electricity for home lighting is a cheaper alternative than kerosene.

CEA's average domestic consumption assumption is 360 KWH per year. The analysis utilizes more conservative estimates.

Taking an average of 180 KWH per year per connection, the economic benefit of substituting electricity for home lighting amounts to Rs.200 (U.S. \$25).

b. Agricultural Consumers - Diesel vs Electricity

Electricity, in comparison to diesel oil, is a cheaper source of motive power. By switching from diesel oil to electricity, the cost savings will consist of reduced expenditures in energy, maintenance, and capital investment.

The following parameters were taken to be representative for India as a whole:

(1) The average electric irrigation pump has a rating of 5 horsepower (HP) (3.75 KW), and is used to lift water from an open, relatively shallow well.

(2) In order to achieve the equivalent output of water, it is necessary to install a diesel engine with a somewhat higher HP rating than an electric motor. On average, for each 1 HP of the electric pump, 1.3 HP of a diesel pump is required.

(3) The life of an electric motor is 15 years, that of a diesel motor 10 years.

(4) The average number of operating hours per year is about 800 per pump. While pump utilization in the Indo-Gangetic plains and the north in general amounts to about 1,300 hours per year, groundwater shortage restricts use in the Southern States to about 500 hours.

(5) Average diesel fuel consumption in a pump is 0.31 liters per HP/hour, lubricant consumption is 0.03 liters per HP/hour.

The cost differential in favor of electric motors used for irrigation purposes is estimated at about Rs. 4,000 per pump per year (U.S. \$500).

c. Commercial Consumers - Electricity vs Kerosene

The same methodology as that used to compute the cost savings of domestic consumers is used in the case of commercial consumers.

The average cost savings per connection per year is approximately Rs.297 (U. S. \$37).

d. Industrial Consumers - Diesel vs Electricity

The approach to estimate the benefits of using electricity rather than diesel oil to power the type of engines used by the small scale agro-industries in the project areas, is similar to that used in the analysis of tubewells.

The following parameters are assumed to be representative for small village industries such as rice and flour mills:

(1) The average rating of the power source is 10 HP (both for electric and diesel engines), equivalent to 7.5 KW.

(2) The average number of diesel power sources is 10 years, of electric sources 15 years.

(3) The average number of operating hours per unit is 800 hours per year, implying 6,000 KWH per year.

(4) Fuel consumption per HP/hour is the same as the case of pumps, marginal cost of providing electricity to the rural area is applicable at the same rate as in the pump case reflecting the dominant irrigation consumption pattern at the substation level.

Based on current studies, the cost differential in favor of the electric motor is about Rs.4,000 per connection per year (U. S. \$500).

e. Street Lights - Electricity vs Kerosene

As in the case of domestic and commercial electricity consumption, there is a cost advantage for electric lighting for the same amount of lighting hours per year.

Under the assumption of 180 KWH per connection per year, the cost differential in favor of electric lighting is about Rs.200 (U.S. \$25).

f. Other Indirect Benefits

This analysis has demonstrated that an 11 percent IERR will be achieved without quantifying additional indirect benefits of rural electrification. Had we considered and been able to accurately quantify the value of other indirect benefits accruing to residential consumers (e.g. the value of the higher quality of light, the possibilities of engaging on extra and new activities, etc.); to farmers (e.g. increased agricultural yield, decreased unemployment and underemployment, etc.); and to the industrial sector (e.g. increased labor productivity, expansion of industries producing electrical appliances and fixtures, etc.), the internal economic rate of return would have been significantly higher.

E. Social Soundness Analysis

1. Introduction

While it is recognized that electrification of rural communities in India as in other electrified rural areas in the world is generally characterized by an initially slow rate of growth, usually started primarily by the more affluent members of the community, the India program includes a number of aspects that attempt to create a climate permitting a broad base participation in electrification. In the interest of understanding who the consumers of electricity are today, particularly in light of REC's ten year history, and the relatively rapid spread of rural electrification during this period, USAID financed a consumer survey^{1/} as part of this project's development efforts. The survey was not only designed to determine who the beneficiaries of electrification are but also to collect data on consumer access to the resources and services associated with electricity as well as to determine within the time allowed for the survey electricity's overall impact on rural communities with a highlight on employment generation.

The Social Soundness Analysis presented below is based in large part on the findings of the survey, a review of the GOI's rural development programs, including the Minimum Needs Program, and a review of socio-economic studies/evaluations sponsored by REC.

The survey was conducted by a private Indian research organization over a three-month long period beginning December 27, 1978. The area covered included three States - Gujarat, Orissa, and Andhra Pradesh - and a total of 69 villages. These states were chosen because they broadly represented the degree of development by regions (Northwestern, Northeastern, and Southern) in India's economically least endowed areas. Eighteen schemes falling into REC's four main loan categories were examined: three each for Ordinary Advanced (OA) and Ordinary Backward (OB) schemes, and six each for the Minimum Needs Program (MNP) and the Specially Undeveloped (SU) loan categories. Existing schemes were chosen for study to understand the nature of current benefit distribution patterns that are likely to be replicated under AID-financed schemes.

^{1/} See Annex K for Terms of Reference for the survey.

2. The Rural Community in India

Indian rural communities are characterized by great diversity in population size, resource availability, land holdings, and level of economic development. The basic unit of rural society is the joint family household where traditional social modes are adhered to, economic activities organized, political relations managed, and religious precepts transmitted. Agriculture is the predominant occupation in which over 70% of the population is engaged. Poverty prevails in large concentrations. Health centers are few in number, so are schools and educational facilities. Nutrition is poor and drinking water is not always available within easy walking distance. Large numbers of low income landless laborers exist alongside the not better-off small and marginal farmers. These farmers face severe agro-climatic constraints to increasing agricultural production. Tribal groups, long neglected by the development process farm land where agricultural conditions are the least favorable.

3. Rural Development in India

a. The Minimum Needs Program

In recent years, the GOI has been focussing its attention and resources on India's most backward rural areas characterized as having low agricultural productivity, large numbers of unemployed and low income levels. The GOI has devised a rural development strategy for addressing these problems, as best exemplified by the Minimum Needs Program created in 1974. This strategy is based on the objectives of raising the standard of living in these areas relative to the more advanced areas. In the GOI's view, the means by which these objectives can best be accomplished are by increasing the amounts of funds from the central GOI budget to those states poor in resources for backward area development.

Under the Minimum Needs Program, a number of sectors have been targeted for attention. These include health, nutrition, rural roads, schools, and electrification. The development approach puts emphasis on creating the infrastructure required to attain each

sector's objectives. Increasing the number of schools in these areas is seen as a necessary step toward reaching the GOI's goal of universal primary education; markets for planned increased agricultural productivity can be reached by developing a rural road system; for agricultural development, electrification is viewed by the GOI and State Governments as the primary energy source for accelerating the rate of production and for the creation of small-scale agro-based rural industries. Increased incomes and employment generation are expected to result from this productive emphasis.

b. Other Development Programs and Agencies

In keeping with its policy orientation of developing the backward areas, the GOI established about the same time that the Minimum Needs Program was being created a number of other programs and agencies designed to complement the Minimum Needs Program. They are also area-based, are targeted to certain poorer segments of the rural population, and focus primarily on removing resource constraints to increasing agricultural productivity. With the possible exception of the Command Area Development (CAD) program which emphasizes the development of surface water irrigation potential, the other efforts as embodied in the Drought Prone Area Program (DPAP) and the Tribal Development Plan depend heavily on the provision of electricity for their success. Groundwater development is emphasized as a key component in agricultural development plans under these last two programs. Their programs are oriented to the less well-off, primarily the unemployed, and the small and marginal farmer. Under these programs, subsidies (administered by separate organizations) are available for assisting these groups: The Small Farmer Development Agency (SFDA) and the Tribal Development Agency (TDA) provide technical assistance to their client groups in farm-level project formulation and coordinate with the local extension service for supplies and expertise in addition to administering a program of subsidies. Under the SFDA, small and marginal farmers are eligible for capital costs subsidies (for pumpsets, for example) that range from 25% for small farmers and 33-1/3% for marginal farmers.

The Agricultural Refinance and Development Corporation (ARDC) is another organization that has a rural development focus. Approximately 70% of its lending program has an emphasis on groundwater irrigation development, and 50% of this lending is channelled to small farmers for the purchase of mostly electrical pumpsets.

The above programs complement the activities of REC by giving poorer, small farmers assistance in taking advantage of the establishment of an electrification infrastructure delivering the least cost source of energy.

4. The Consumers of Electricity

Based on the findings of the AID-financed survey more than half (54%) of the 831 persons interviewed were using electricity and 11% reported they had an application on file and were therefore considered potential consumers. Several of the non-consumers (27%) said they were interested in electrification but faced financial constraints for obtaining a connection while a very small minority of 8% claimed no interest in electricity whatsoever. Some in this group felt electricity was not essential to their well-being and still others expressed a fear of accidents for not wanting electricity. The majority (62%) of domestic/commercial consumers were using electricity primarily for household lighting. Very few members went in for fans, radios, or other electrical appliances. Industrial connections were made primarily for small-scale agro-based (rice hulling for example) industries.

5. Beneficiaries and Benefit Distribution

Within the group using electricity, agricultural consumers will gain the most from the savings that accrue to electricity over diesel. They are the primary consumers of electricity as indicated by REC figures which show that agricultural connections account for an estimated 60-70% of the total connected load in a scheme. Domestic connections are the highest (approximately 70%) but energy used represents about 20% in a scheme. Other beneficiaries include the landless or the near landless who will find

employment generated by intensive agriculture made possible by electrified irrigation systems. To a lesser degree employment potential for these groups will be created by the growth of small-scale industries.

In terms of the distribution of benefits, AID supported MNP and SU schemes are expected to replicate the patterns reflected in the survey and summarized below in Tables 1, 2, and 3.

By adjusting the ILO poverty line (\$175 per capita at 1972 prices) to reflect 1979 prices in India, the poverty line moves up to \$300 per capita which approximates the AID definition of the poor majority using current prices as a guideline. The \$300 per capita figure is equivalent to Rs. 12,000 a year for an average household of five persons. Viewed in this context, table 1 shows that a significant number (79%) of households using electricity fall below this poverty level. If the Indian poverty line of \$100 per capita (or Rs. 4,000 per family per year) is used, slightly less than 50% of the consumers receiving electricity would fall below this level. Based on the above findings in existing schemes, it is expected that a predominant population of the beneficiaries of the AID supported project will be within the AID definition of the poor majority.

Table 1 - Income Distribution Patterns Among Electricity Users by Household Income

<u>Income (Rs.)</u>	<u>Electricity Users</u>	<u>% of total</u>	<u>Cum. %</u>
Less than 2,000	50	11	11
2001 - 3000	57	13	24
3001 - 5000	113	25	49
5001 - 7000	70	16	65
7001 - 10,000	64	14	79
10,000 - 15,000	54	12	91
Above 15,000	<u>38</u>	<u>9</u>	100
Total	<u>446</u>	<u>100</u>	

Using land holdings as a measure of distribution spread, the survey findings show that 52% of all farmers who have electricity own land of less than 4 hectares, and most (96%) were owner cultivators. Broken down by MNP and SU schemes the data reflect that in both types of schemes a majority of the agricultural users also have holdings of less than 4 hectares. In MNP areas the number of such owners represented 61% of all landowners, and in SU areas, the figure was slightly less at 58%. See tables 2 and 3 below for land holding distribution patterns.

Table 2 - Land Holding Distribution Among Electricity Users (Agricultural)

<u>Holdings (Hectares)</u>	<u>Electricity Users</u>	<u>% of Total</u>	<u>Cum %</u>
Below 1	7	3	3
1 - 2	47	23	26
2 - 4	52	26	52
4 - 6	29	14	66
6 - 10	34	17	83
Above 10	<u>34</u>	<u>17</u>	100
Total	<u>203</u>	<u>100</u>	

Table 3 - Land Holding Distribution by Scheme Among Electricity Users (Agricultural)

<u>Holdings(Hectares)</u>	<u>OA</u>	<u>OB</u>	<u>SU</u>	<u>MNP</u>	<u>Total</u>
Below 1	1	1	3	2	7
1 - 2	5	13	10	19	47
2 - 4	14	9	16	13	52
4 - 6	7	9	7	6	29
6 - 10	11	9	5	9	34
Above 10	<u>12</u>	<u>6</u>	<u>9</u>	<u>7</u>	<u>34</u>
	<u>50</u>	<u>47</u>	<u>50</u>	<u>56</u>	<u>203</u>

As revealed by the data, very few farmers owning less than 1 hectare went in for electricity. In light of this finding, the survey concludes that (and this is confirmed by existing studies

in India) pumpset irrigation is economically viable at a cut-off point of approximately 1.2 hectares although favorable soil, weather, and water conditions may permit irrigated farming for smaller plot sizes.

6. Access to Resources and Services

a. Connections

Getting an electrical connection is a multi-step, involved and time consuming process varying in the amount of time, location of the service connection, and requirements that differ from state to state. Nevertheless, given the requirements of an application of this type, on the whole the SEBs performance has been quite good. On the average, according to the survey, the time taken for different kinds of connections are as follows: agricultural, 3.4 months; industrial, 3.5 months; and domestic/commercial, 2.7 months. Data collected on the time taken for obtaining a connection showed that many (about one-third) agricultural consumers received a connection within a month of application; most (73%) received one within 3 months. Most domestic/commercial consumers also received their connections within a satisfactory period of time. A minority of villagers attributed their difficulties in acquiring a connection to procedural delays on the part of officials. The delays, however, particularly with regard to agricultural groups, were experienced irrespective of size of land holding, according to the survey.

b. Affordability of Electricity

Connections of whatever type and charges for electricity, particularly for agricultural users, are heavily subsidized by State governments. The underlying reason for this situation is largely attributable to policy orientations to the agricultural sector in light of the heavy emphasis placed on agricultural production as a means to raising incomes and generating employment. The connection charges vary from state to state and in the amounts each SEB is willing to absorb as a subsidy to their consumer. Most states share a part of the total cost of connections with their prospective consumers. Connection costs within states may vary depending on

the type of consumer service required and for agricultural consumers, with the distance of their pumpsets from the service line (See Annex G.2). Although limited data is available on this subject, it is generally acknowledged that the costs of a connection do not impose a major constraint in applying for electricity where other factors make the service economically and socially attractive. This was pointed out by the survey which showed that for purposes of household lighting, most domestic/commercial users of electricity were able to finance the costs of a connection from their own resources. Although the survey did not explicitly make the same conclusions for agricultural consumers, the same assertion may be made in light of the low costs charged for agricultural connections. These costs range from a low of Rs.360 (\$45) in Andhra Pradesh to a high of Rs.1,250 (\$156) in Rajasthan. In Andhra Pradesh, the consumer's contribution is only Rs.125 (\$16) while in Rajasthan it is a little over half. Given the number of agricultural users below the 4 hectare level the implicit assumption is that the connection costs are affordable for smaller landowners.

The question of affordability also arises in connection with energy rates charged. The tariffs for agricultural groups in all states are lower than the costs of providing service, and by all accounts, is affordable by wealthy and poor groups alike. The low charges reflect a strong policy orientation by State Governments towards the agricultural sector on which development primarily rests. This low rate policy is also designed to reach all segments of the farm population including the relatively disadvantaged sections.

The average agricultural rate for India today is approximately .18 Rs. per kilowatt hour or approximately 2 cents. To help curb SEB losses to the agricultural sector, the charges for other consumer groups (domestic/commercial, etc.) are set at a much higher rate, and it is these consumers who subsidize in effect the rates extended to agricultural users (See Annex G.1). Very clearly State Governments prefer to maintain their present rate structures, as it is one way of reaching the economically weaker farm groups to increase their production and to raise incomes and employment levels. Other incentives are the low fertilizer rates made available and the similarly low surface irrigation water rates.

Once again given the income levels and farm size holdings of RE consumers examined in the survey, it may be concluded that existing rates as well as connection charges do not preclude the use of electricity by small farm holders and lower income groups.

In her paper for PPC titled "Rural Infrastructure Projects: Electrification", Judith Tendler makes a strong case for low agricultural rates in developing countries faced with serious unemployment problems. Since increased productivity can alleviate these problems, low cost energy to the farm sector would be one incentive for increasing the productive base and generating employment in the process.

c. Institutional Finance

A farmer owning less than 4 hectares and willing to invest in groundwater irrigation usually has to resort to external financing unlike domestic users, and does so mostly from institutional sources. The survey indicated that of those borrowing, 65% use established institutional sources including development banks, commercial banks, and cooperative societies. Of the rest, 18% were shown to borrow from unreported sources, 4% from friends and relatives, and only 8% turned to money lenders; 5% of the borrowers did not make any response.

7. Impact of Electrification

a. Agricultural

The survey pointed out several agricultural changes brought about as the result of electricity. These are as follows:

(1) a decline in the number of traditional sources of irrigation - village tanks or ponds - in favor of groundwater resources evident by the number of wells dug with the advent of electrification.

(2) an increase in the number of irrigated acreage although it is not always possible to isolate electrification's role in this development.

(3) the replacement of traditional lift irrigation systems by electrical pumpsets; for example, in some areas, persian wheels were no longer in use.

(4) a decline in the number of diesel pumpsets by about 20%; farmers noted that electrical sets were preferable because of their cheaper operating and maintenance costs compared to diesel pumps.

(5) a change in cropping patterns; cropping intensity increased and shifts to wet crops as paddy were noted.

b. Employment Generation

The time allotted for the survey only permitted limited data on employer' generated resulting from the introduction of electricity. Nevertheless the survey findings did show that farmers felt that the demand for labor went up and more jobs were created than existed before electrification. Employment generated by small-scale industrial development has been a focus of a previous REC-sponsored study titled, "Impact of Electrification on Rural Industrial Development" undertaken by the Small Industry Extension Training Institute, Hyderabad (1976). That study showed a dramatic increase in the number of industrial units that were established after the advent of electricity; in certain villages, the increase was five-fold. What this study conveyed, and corroborated by the limited findings of the AID-financed survey, was that on the average, approximately 2 jobs are created as a consequence of small industry development - one usually for the entrepreneur and the other for an assistant.

Data on on-farm increases in employment attributable to electrification are not final. A complete picture of the effects of electrification in this sector should be available once REC's study of electricity's overall employment impact (direct and indirect) is concluded, expected by this August. What data is available reflects employment generation as a result of irrigation. On the average, labor demands increase from 70 man days per hectare per year for dryland agriculture to approximately 200 man days under irrigated conditions. This implies an increase of about 200% on a per hectare basis in labor requirements.

While additional data needs to be developed and analyzed on the employment generation impact of the RE program, it is clear that the strategy of the GOI is to utilize the potential of rural electrification to increase employment and production of the poor, the so-called "forward linkages". As for employment-creating local procurement or so-called "backward linkages", local suppliers are expected to win most, if not, all of the awards under this and the IDA project. To the extent the program is accelerated through more rapid expansion from donor financing, increased employment should result from both forward and backward linkages.

8. Quality of Life Changes

Of all the respondents asked, most (91%) said that street lights were a source of benefit for a number of reasons related to security, aesthetic value, and business, since shopkeepers could now stay open late hours. A number of consumers also claimed that electrification also brought about life style changes such as greater time spent in the evening on a number of activities ranging from reading to business. In other studies related to the intangible benefits of electrification, electrification meant increased use of the media and hence a wider dissemination of information and culture than before. A dramatic example of this consequence of electrification is cited in a separate study of two tribal villages in Andhra Pradesh where movie theaters came into existence at the initiative of local villagers. However, electricity is not without its drawbacks for a small minority of villages surveyed. The most frequently cited disadvantage was based on respondents' fear of accidents. Several complained of maintenance problems, others said electricity was expensive, and still others were critical of load shedding or power failures.

9. Electrification and Rural Women

Electrification will indirectly benefit rural women, as they will find increased employment opportunities provided through irrigated agriculture. Under another AID-financed irrigation project, Gujarat Medium Irrigation, Gujarat State officials estimated that 50-60% of agricultural labor used in producing rice, wheat, and bajra is provided by women. Increased food production hence income should increase nutrition and health for all family members. Higher income may also mean purchase of better-quality consumer goods, particularly clothes and for women an increased ability for their participation in religious pilgrimages and festivals.

F. Environmental Assessment - Summary

The approach to examining the environmental impact of India's rural electrification program has been undertaken against the backdrop of a widely-scattered, country-wide, on-going program concentrating on groundwater irrigation of small units as the principal project objective. This backdrop is fully described in other parts of the PP and needs no elaboration here. In view of the nature of this program, the Mission considered that the most effective way to focus key decision makers on potential environmental issues was to request the prime agency involved, REC, to directly address such issues themselves. This approach is consistent with guidelines provided in AIDTO Circular A-22 that "The environmental assessments' role is to help 'decision-makers' understand likely consequences of the activities, mitigating actions that might be taken, and alternative approaches to the end goals. Its purpose is to permit more informed decisions to be made in the context of the development priorities of the country".

Accordingly, a list of issues to be addressed (See Annex J, Part I) was presented to REC with a request they provide information and analysis from their own and other recognized sources of the impact resulting from the RE program on certain aspects of the environment. Possible issues were developed from an examination of the Pakistan and Philippines EAs for rural electrification as well as relevant sections of AID's Environmental Assessment Guidelines Manual. The document was further reviewed with AID and consultant environmental experts at the Asia Bureau Environmental Seminar held in Thailand in December 1978.

The groups of potential impacts were identified: 1) impact of project construction (primary); 2) agriculture/irrigation (secondary); and (3) domestic, commercial, others (secondary). Under each category, more detailed areas of potential environmental impact were identified. It should be noted that all issues listed were not necessarily considered to have significant

impacts but served as a check list of potential areas of impact. Based on a number of discussions and several submissions of materials by REC, as well as discussions with an AID rural electrification engineer and AID expert on groundwater management, the following summary picture emerges. (Details are contained in Annex J, Part II).

1. Impact of Project Construction

REC has standardized construction practices to satisfy safety norms laid down by the Indian Electricity Rules. Physical acceptability as well as technical suitability is considered in the placement of substations and lines. The construction program is carefully designed to avoid or minimize damage to trees and garden lands in the area. Precaution is taken in the erection of poles in the fields and villages in order not to mar the appearance of the area. The Forest Departments of state governments must approve alignments in wooded areas. The implementation of construction uses traditional transportation routes and methods, while pole digging and erection is done manually, thus minimizing any adverse impact on the terrain. Thus the nature of the project and its implementation excludes any significant disruptive direct impact on the environment.

2. Agriculture/Irrigation

From the listing of possible environmental impacts, the principal concerns identified were groundwater use and increased use of fertilizer and pesticides. Prior to any scheme being approved by REC, a certification must be included from a competent technical authority, such as the State Groundwater Organization, on the availability of groundwater to avoid over utilization of the aquifer. REC has a groundwater unit which examines and verifies such information. The use of fertilizer in India at the level of 20 kg of nutrients per hectare is quite low and does not have any significant adverse impact. The same is true of pesticides. Any increased employment will use existing unemployed and underemployed persons in the area; thus no

population shifts are anticipated. Through the increased installation of tubewells the problems of waterlogging and salinity will diminish somewhat because of a lowering of the water table. The electrification of pumpsets will replace substantial diesel pumping and is a cleaner form of energy.

3. Domestic/Commercial

The bulk of power utilization in any scheme is for agricultural purposes (60-70%). The development of rural industry will be of a very small scale nature, particularly in the MNP and SU programs where AID assistance is targeted. Thus there is no expectation of any significant industrial pollution, demand for added infrastructure, etc.

None of the above mentions the substantial benefits and positive environmental effects of rural electrification, particularly in the agricultural production and employment areas since these are well documented throughout this project paper.

One aspect worth reiterating is the process from which the above information and conclusions were obtained. This was a continuing dialogue with REC on the various possible environmental impacts of the program. It was an attempt to focus decision makers on an additional set of concerns in making project decisions. As the above conclusions demonstrate, the impact on the environment does not appear to be such as to warrant additional steps or different approaches to project design and implementation. However, there is an awareness now developed in REC that can form the basis of a continuing dialogue on the subject of environmental impact such that if warranted, a reexamination of environmental issues can be made as the program is carried out. The conclusions on the agricultural and irrigation questions were thoroughly vetted with an AID groundwater expert in India on another AID project who corroborated the above conclusions.

Part IV. Implementation Arrangements

A. GOI Managerial/Administrative Arrangements

1. Project Appraisal and Monitoring

Upon the submission of project proposals by SEBs, REC makes an independent appraisal of each project's technical, economic and financial viability. The appraisal process begins at any one of the eleven regional offices with a review of the accuracy of project data, the estimates of load growth, the satisfaction of criteria for the kind of loan requested, the project's coordination with other development efforts in its area, the availability of sufficient groundwater, and whether technical design will achieve project purposes (agricultural production) at minimal cost. The technical analysis focuses attention on methods of reducing line losses and maximizing power and load factors. The financial analysis is designed to examine the project's capital needs, operating costs and revenues to be generated and the financial return of the project. On the economic side, assumptions regarding the project area's growth are questioned. Regional level reviews are made by qualified teams consisting of electrical engineers, economists, and financial analysts who make field visits as a part of the appraisal process. At this level the entire process can take anywhere between three days to one week depending on the project proposal. Once the reviews are completed by the region, the proposal is sent to REC's Project Appraisal and Monitoring unit for final review and approval. After project approval, REC satisfies itself that guarantees for the loan are provided and that realistic procurement schedules are made prior to releasing the first instalment, generally 30% or 40% of the loan amount depending on the type of loan^{1/}. Additional releases are made once a year for the life of the project but on the condition that satisfactory progress towards the project's estimated physical targets as well as load growth is made. Where progress

^{1/} 40% for MNP and SU loans and 30% for all other loan schemes.

is unsatisfactory, REC, normally at the regional level, holds detailed discussions with SEB officials to determine causes for the lack of progress and to suggest methods for improvement. At the central level, quarterly progress reports of each project is reviewed primarily to see how far projects are achieving their targets. REC's computer facilities will help to quickly identify problem projects and areas.

2. Materials Procurement Process

The materials are procured by each State Electricity Board (SEB) independently of each other, and each SEB procures on the basis of open bids solicited by advertisement. Bids are awarded to the lowest, acceptable bidder.

Under the AID loan, certain bids, because of size of bid package and type of item, will be open to Code 941 as well as Indian suppliers. These include conductors, cables, transformers, insulators and meters and represent about 43% of total project costs or \$50 million of the AID financing. Such bids will be advertised in the Commerce Business Daily and the AID Small Business Bulletin. However, it is anticipated that very few bids, if any, will be made or awards won by non-Indian suppliers, mainly because of price competition and special manufacturing that may be required to be technically compatible with Indian specifications. USAID representatives have reviewed the procurement procedures for these items and find them acceptable.

Certain items will be limited to local bidding. These include insulated wire, air break switches, lightning arrestors, L. T. cutouts, G.I. wire and cross arms and represent about 7% of total project costs equivalent to the \$8.0 million remainder of the AID loan. Such items are grouped in small quantities spread over a number of SEBs. Practically all such bid packages will be under \$100,000. Cost of freight on some of these items like L. T. cutouts would be extremely high because of their bulk.

Almost all items will be provided by very small suppliers. Accordingly, the Mission has determined that bidding on these project components should be restricted to Indian suppliers. This is consistent with IDA's position on bidding for the same items under their Credit and will provide consistency for the SEBs in arranging procurement for the various schemes. USAID will review the detailed procedures for this local procurement. Consistent with AID practice, all awards will be made to the lowest responsive bidder.

USAID will not require prior approval of contracts under \$100,000 (See AIDTO CIRCULAR A-458 dated 11/7/78). This will include most contracts for items under the local bidding grouping. The contracting procedures of most states are well defined and provide assurances for competitive bidding and reasonable prices. REC will specifically approve procedures to be used by the SEBs for such contracts. The Mission has concluded that the bidding process, evaluation and awards by the SEBs, which are reviewed and approved by REC, justify proceeding on contracts less than \$100,000 without prior AID approval. IDA has also agreed to this procedure.

Materials will be procured in a single procurement action for each state for a two year period with delivery phased over eighteen months. This approach is expected to reduce the amount of paper work (bid documents, etc.) as well as minimize implementation bottlenecks.

Bid documents have been standardized by REC for states eligible under the IDA credit. The terms and conditions contained in these are consistent, with few exceptions, to AID requirements. USAID is reviewing the general terms and conditions and will assure these will meet AID requirements. REC finalizes the standardized bid documents (including bid terms, conditions, specifications, and price escalation clauses), provides them to

SEBs, and in consultation with SEBs makes a final determination of the quantity of materials to be procured. REC discusses with SEBs over a 6 week period, usually beginning with each new financial year (April 1), all the procedures and requirements of the procurement process.

Bids are evaluated according to their responsiveness at the SEB level and are then forwarded to REC for its review. AID and REC have agreed to a 60-day bid period for the AID financed material. AID has reviewed and approved the technical specifications for items to be bid in Code 941 countries. Specifications for items limited to local procurement are under preparation and will be subject to AID approval. REC procedures will require a 90 day period from the time bids are opened until orders are placed.

Materials delivered are stored in SEBs' central warehouses or in regional warehouses depending on the location of project sites. To the maximum extent practicable, AID-financed materials will be kept separately in such warehouses by way of AID markings (to be provided to suppliers) for transformers, meters, and containerized conductors. Other items such as insulators, L.T. cutouts, lightning arrestors, etc., however, would be too small in size and numerous to permit any acceptable method of segregation.

B. Implementation Plan

1. Loan Agreement Signed	June 1979
2. Conditions Precedent Met	September 1979
3. Bids Issued	December 1979
4. Bids Processed	February 1980
5. Bids Awarded	May 1980
6. Contracts Signed	June 1980
7. Commencement of Material Delivery	August 1980
8. Completion of Material Delivery	January 1982
9. Project Assistance Completion Date	June 1983

While the Project Assistance Completion Date (PACD) has been established at June 1983, it is expected that most of the materials will be delivered by January 1982. However, REC advises that it will only be in a position to accept such material when received. If material provided at the latter part of the delivery schedule is unacceptable, new bids will have to be issued and phased. This accounts for the establishment of the PACD 18 months after the scheduled last delivery. It also provides for possible slippage in the proposed schedule. Actual utilization of AID financed material on schemes will take place in four to six months of receipt.

C. USAID Administrative Arrangements

1. Disbursements

a. Procedures

USAID, shortly after execution of the loan agreement will request from AID/W's Office of Financial Management the Direct Reimbursement Authority (DRA) it will need for reimbursing the GOI for expenditures eligible under the AID financed loan.

Disbursement procedures have been discussed with REC officials and will be detailed in an Implementation Letter. In general these procedures will be as follows:

SEBs will make payments to individual suppliers against orders placed. Suppliers' invoices and an SEB certification of payment is then forwarded to REC/Delhi for its review and approval. Based on its determination, REC will make a formal request with supporting documentation to the Ministry of Finance (MOF) for reimbursement under the AID loan. The MOF will then request reimbursement from AID, supported by documentation required by USAID. On a review of these documents, USAID will then approve reimbursements.

b. Schedule (millions of dollars)

	<u>FY 80</u>	<u>FY 81</u>	<u>FY 82</u>	<u>FY 83</u>	<u>Total</u>
AID	1	16	31	10	58

2. Project Monitoring

USAID intends to rely mostly on REC's own proven capability for project monitoring and will coordinate its monitoring functions with those of REC. It is, therefore, anticipated that field visits to several randomly selected on-going schemes will be made by USAID representatives. It is expected that this will be undertaken several times a year by Mission officials including an engineer who is familiar with the technical requirements and other components for rural electrification projects. TDYs from AID/W for technical monitoring may also be requested periodically as project needs warrant.

D. Project Evaluation

REC's evaluation program consists of current (as referred to by REC) and long-term evaluations. The current evaluation program is synonymous with REC's monitoring functions and is the responsibility of the Project Appraisal and Monitoring division. As discussed in section A.2. above, REC's monitoring activities relate to each project's physical progress towards achieving connected load targets as well as to completion of the schemes. This is done through computer feedback reports and continued dialogue with SEB staff.

The long-term evaluation program encompasses three areas of interest to REC: (1) the evaluation of REC's loan policies, (2) the evaluation of the applicability of various loan categories to determine their relevance to development needs and (3) socio-economic impact studies.

To help it carry out its evaluative functions, REC's Research and Evaluation Unit is staffed by qualified professional social scientists. The unit at present consists of a full-time division chief, 2 joint directors, 2 deputy directors, 2 assistant directors, and 2 economic analysts. Two more economic analysts are expected to fill out the entire staff complement. Apart from these professionals, REC occasionally employs trained research assistants on a part-time basis to assist the regional offices in data collection and analysis. At present there are 12 such assistants.

As a result of one of the Research and Evaluation Unit's studies, the REC board instituted policy measures designed to minimize the impact of inflation on projects during the early seventies. Based on the findings of another study, it is anticipated that loan terms and conditions may be modified for the Mini-Health loan category to promote faster growth of electrified health centers.

A major component of REC's long-term evaluation program is clearly its socio-economic impact studies of electrification. In light of the diversity of its loan portfolio, not to mention the

socio-cultural and economic characteristics of India, REC faces a very large and demanding challenge to determine the effects of electricity on its users. To help meet this challenge and to provide guidance and to set priorities, REC has created a Committee for the Coordination of Research, Development, Evaluation, and Training called COMCORDET.

On purely technical subjects, REC-sponsored technical research results have been incorporated into project design and equipment specifications.

A critical component of the long-term evaluation program is REC's impact studies which have been conducted by private consultancy organizations or academic institutions. REC usually invites proposals from one or more of these with regard to evaluation design, implementation and cost as appropriate prior to the start of each evaluation effort.

Over the last ten years, 17 REC-sponsored studies have taken place on a variety of topics to determine the impact of electrification. Several of these have been related to the financial aspects of rural electrification schemes, others to the effect on rural industrial growth, and still others on the benefit/cost aspects of selected schemes. In recent years, REC has formulated studies that focus on the distribution of benefits gained from electrification, in direct response to the central GOI's interest in this aspect of development. Currently a ten-month long study of the employment effects of rural electrification is in process.

Given the geographical constraints that a large nation-wide program poses for evaluation efforts, REC has generally limited the scope of its study to selected states (four or five at a time) that represent a region and to a manageable number of schemes (generally four per state) for in-depth study. These studies, to the extent possible, make comparisons between non-electrified and electrified villages.

The importance of base-line data for evaluation purposes is recognized by REC. It has begun a process of collecting data at each of 5,000 development blocks in the country. Many of the REC schemes are co-terminous with these blocks which on an average consist of 70 to 80 villages and are administrative units designed for development activities. To collect this information, the Research and Evaluation unit has prepared a comprehensive questionnaire which has been field tested and finalized. The questionnaire is divided into ten sections as follows: (1) degree of electrification of villages, hamlets, and other areas (2) soil classification and geology (3) land utilization (4) groundwater and irrigation potential (5) cropping pattern and yield (6) rural industries (7) human resources base, population occupation, etc. (8) infrastructure and social facilities (9) scope of special development programs in the block and (10) credit facilities available.

Base-line data in largely unelectrified MNP areas is in the process of collection and will therefore have significance to REC as it designs its evaluation programs for MNP areas in the next year (since the MNP loan category has only been recently introduced, no evaluations have taken place so far).

Apart from base-line and follow-on surveys as a necessary component of evaluations, REC is also very much aware of the social ramifications of electrification. Discussions with officials reveal an interest to examine social changes -- positive and negative brought about by electricity. Interest is also shown in such questions as: (1) the quality of employment generated (2) changes in social structure and family patterns (3) changes in property ownership (4) changes in agricultural practices, and so on.

The Research and Evaluation Unit's officials are sensitive to AID's requirements regarding project evaluation. Accordingly

they welcome any input (if USAID deems this necessary) into the design of MNP and SU scheme evaluations. Funding for past evaluations have not been a constraint for REC, and despite a step up program for the future, funds are expected to be available. Such money comes out of REC's overall operating budget and are made available upon the COMCORDET's decision at each of its mandatory bi-annual meetings. Thus far approximately \$1.6 million (Rs.13 million) has been spent for REC's evaluation program.

In view of the above discussion of REC's evaluation program, its past experience and future programs, USAID is prepared to rely on the resources and talent REC has available to it for fulfilling AID's evaluation requirements. At the same time, the Mission will maintain a continuing dialogue with REC in working together to assure effective evaluation of the socio-economic impacts of AID-financed schemes.

E. Conditions, Covenants, and Negotiating Status

The following are the Conditions Precedent and Covenants that AID will negotiate with the Government of India. These have been discussed and generally agreed to with the GOI, but the exact language will be determined during final Loan Agreement negotiations.

1. Conditions Precedent

In addition to the standard conditions, the following will be included:

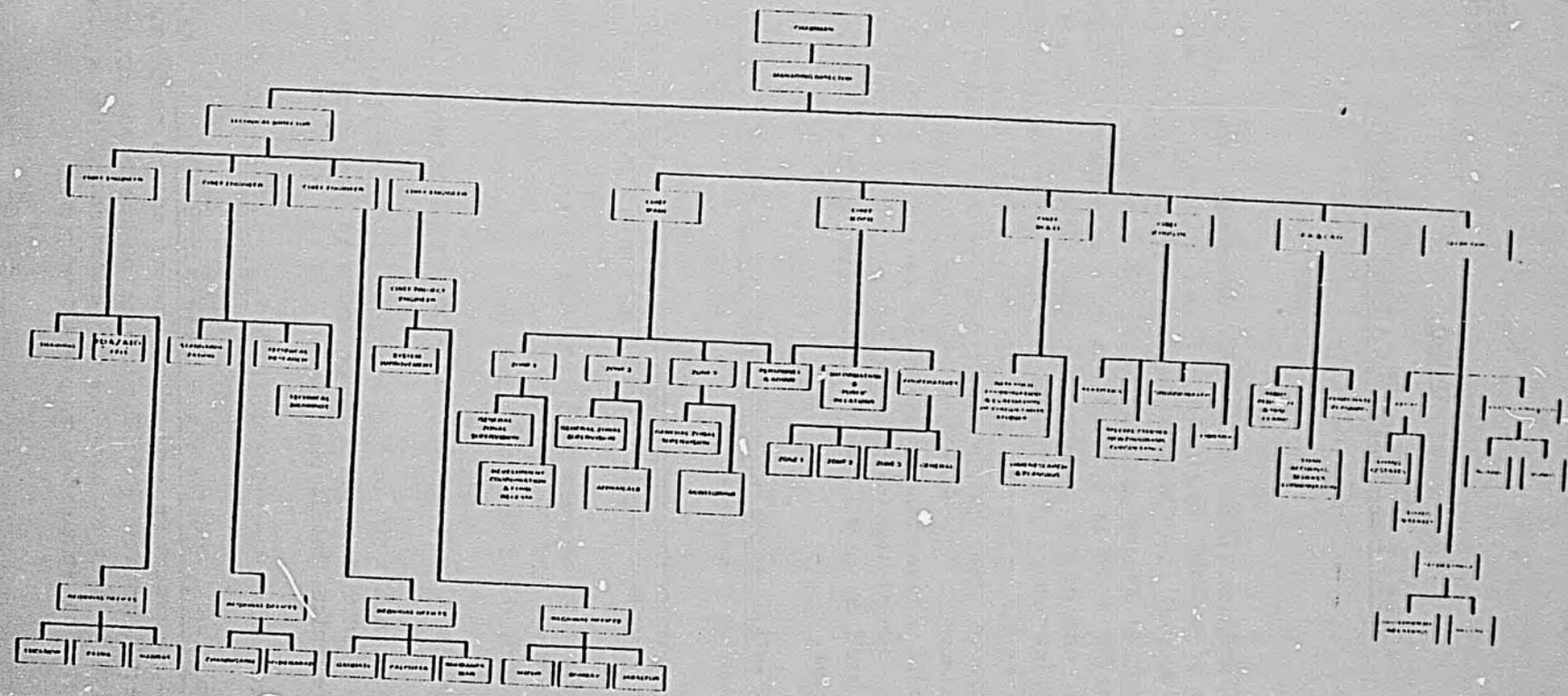
- A draft tender document including specifications for all equipment and material to be procured under the Loan; a schedule for the procurement and installation of such equipment and material.
- Procedures for procurement of equipment and material restricted to local bidding.

2. Covenants

Funds will be relented by REC only to those State Electricity Boards which are eligible for IDA financing of rural electrification schemes*.

These include those State Electricity Boards whose earnings enable them to meet a 9.5% rate of return on assets (as defined by IDA) and any other SEBs whose State Government agrees to provide it a subsidy for rural electrification losses either to their full extent or to the extent required to meet the 9.5% rate of return, whichever is lower.

ORGANIZATION CHART OF REC



BEST AVAILABLE COPY

INDIA

RURAL ELECTRIFICATION PROJECT

The Technical Division of REC comprises four cells, each under the charge of a Chief Engineer. Three of these, two at the Head Office and one at the Calcutta Regional Office, are responsible for technical appraisal and monitoring of RE projects. The appraisal and monitoring work is carried out by the respective Regional Offices. In addition, one of the cells at the head office is entrusted with the work of utilization of the IDA Credit and assisting the SEBs in purchasing the materials under the Credit through International Competitive Bidding and the other cell assists the Electricity Boards in the training of RE personnel. The fourth cell is entrusted with the work of System Improvement, Research, Development and Standardization. The standardization work comprises formulation of specifications of materials and equipment used in rural electrification and standardization of construction practices.

The Project Appraisal and Monitoring (PAM) Division is responsible for the following functions:

- (1) Pre-sanction economic appraisal of RE projects (providing team support to the Technical and Finance Division in project appraisal).
- (2) Coordination between SEBs and the other developmental agencies at the State and Project level as well as direct coordination of REC with the other concerned developmental agencies.
- (3) Current evaluation and review of the progress of the RE projects.
- (4) Performance audit of the accounts of the projects financed by REC at their implementation stage and also providing team support to the Technical Monitoring Cell.
- (5) General Administration work of the Corporation.

The Planning, Evaluation & Research Division is responsible for carrying out perspective evaluation studies on the performance of projects and the overall impact of REC projects on the rural economy as a whole. This Division is also responsible for coordinating the applied research/evaluation studies sponsored by the Corporation.

-2-

The Finance Division comprises the following units:

- (1) The Loans Unit maintains the accounts of disbursements of loans.
- (2) The Bills Unit deals with bills of the expenditure of REC.
- (3) The Internal Audit Unit does the internal audit of the accounts of REC.
- (4) The Commercial Accounts Unit prepares financial statements as required by the Statute.
- (5) The Pre-sanction Appraisal Unit examines the financial viability of projects at the pre-sanction stage in the light of the data furnished in the project reports by the SEBs and provides support to the Technical and PAM Divisions in project appraisal.
- (6) The Cost Verification Unit is responsible for verification of cost data of rural electrification projects and cost of power applied to rural electrification projects in respect of each State Electricity Board.

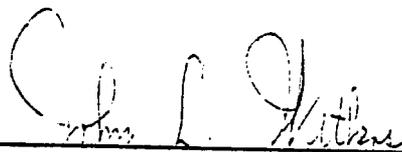
The Cooperative Organization & Planning Division is responsible for organization and development of rural electric cooperatives besides looking after the loan operations of these cooperatives. This Division also holds charge of personnel administration besides information and publicity.

The Common Services & Consultancy Division provides special services to all the Units of the Corporation. These services include (i) Water Resources (specialised information on ground water, etc.), (ii) Rural Industries, (iii) Data Bank and Information System, (iv) Co-ordination of Training Programmes and (v) Internal and External Consultancy.

Annex B

INDIA - RURAL ELECTRIFICATION
CERTIFICATION PURSUANT TO SECTION 611 (e) OF THE
FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, John L. Withers, principal officer of the Agency for International Development in India, having taken into account among other things the maintenance and utilization of projects in India previously financed or assisted by the U.S. and the commitment and resources of the Government of India applied to rural electrification, do hereby certify that in my judgment India has the financial and human resources capability to implement, maintain and effectively utilize the assistance proposed for India's rural electrification program.



John L. Withers, Mission Director
USAID/India

30 April 1979

Date

Annex C

Host Country Request

To be provided prior to Project Authorization

FM SECSTATE WASHDC
TO AMEMBASSY NEW DELHI 7528
BT
UNCLAS STATE 308528

IADAC

E.O. 11652: N/A

TAGS:

SUBJECT: FY 79 RURAL ELECTRIFICATION 386-0462: PID
REVIEW

REF: PID DATED 19 OCTOBER 1977

1. PROPOSED PROJECT AS PRESENTED REF DOCUMENT REVIEWED BY APAC 7 NOVEMBER 1977. APAC AUTHORIZED PREPARATION PP FOR FUNDING IN FY 79. PP WILL BE EXPECTED TO ADDRESS FOLLOWING ISSUES RAISED DURING APAC REVIEW. TWO OR THREE PERSON TDY TEAM SHOULD BE POSSIBLE IN JANUARY-FEBRUARY 1978 TO INITIATE PP PREPARATION. WILL ADVISE.
2. BECAUSE OF INDIA'S LONG EXPERIENCE IN RURAL ELECTRIFICATION, THERE SHOULD BE GOOD DATA AVAILABLE REGARDING COST/BENEFIT ANALYSIS, SOCIAL AND ENVIRONMENTAL IMPACT, CHARACTER OF BENEFICIARIES, AND IMPLEMENTATION PROBLEMS. PP SHOULD REFLECT AVAILABILITY AND ANALYSIS OF SUCH DATA AND SHOULD DESCRIBE RURAL ELECTRIFICATION (RE) PROGRAM AS A WHOLE AND HOW AID'S CONTRIBUTION WILL FIT.
3. DURING PP PREPARATION APPROPRIATE PROFILE OF BENEFICIARIES WILL NEED TO BE DEVELOPED TO ENSURE TARGET GROUP CONFORMS WITH AID NEW DIRECTIONS. THEREFORE, AID ANALYSIS WILL HAVE TO BE ESPECIALLY SENSITIVE TO THE INCOME-DISTRIBUTIVE IMPACT OF ELECTRIFICATION (E.G., PUMP EMERGIZATION) AND AFFORDABILITY OF POWER BY TARGET GROUPS. THE PP WILL NEED TO ASSESS THE EFFECTIVENESS OF SMALL FARMER-ORIENTED SERVICES AND INVESTMENTS WHICH IS ONE OF REC'S CRITERIA IN SANCTIONING INDIVIDUAL SCHEMES. PER PAGE FOUR OF PID, REC ALREADY SEEMS TO BE AWARE OF THE GENERAL QUESTION OF SECONDARY EFFECTS OF RURAL ELECTRIFICATION. AID'S REVIEW MIGHT ONLY BE A SHARPER FOCUSING.

-2-

4. THE PP SHOULD BE SPECIFIC ON HOW AID FUNDS WILL BE CHanneled TO INDIVIDUAL RE SCHEMES, I. E., HOW FUNDS CAN BE TRACKED. PP SHOULD SHOW WHETHER AID FUNDS WILL BE PART OF A GENERAL BUDGET FOR SUPPORT OF THE BACKWARD AREAS PROGRAM OR WHETHER SPECIFIC PROJECTS WILL BE IDENTIFIED FOR AID PARTICIPATION.

5. PID PROPOSED AN AID CONTRIBUTION OF DOLS 82 MILLION OUT OF TOTAL PROJECT OF 126 MILLION, I. E., PROJECT CONTRIBUTION OF 65 PERCENT. APAC CONCLUDED THAT AID CONTRIBUTION SHOULD NOT EXCEED FIFTY PERCENT. THUS, LEVEL PROPOSED IN PP SHOULD REFLECT A FIFTY PERCENT LIMIT ON AID'S CONTRIBUTION TO OVERALL PROJECT, OR NOT MORE THAN DOLS 63 MILLION IF CURRENT ESTIMATES HOLD, INCLUDING DOLS 58 MILLION IN CP FOR FY 79. VANCE

UNCLASSIFIED

INDIA

RURAL ELECTRIFICATION PROJECT

Types of Schemes Financed by REC

(i) Area Schemes:

Ordinary Advanced (OA) - Electrification of groups of villages in economically advanced areas.

Ordinary Backward (OB) - Electrification of groups of villages in somewhat less advanced areas.

Specially Underdeveloped (SU) - Electrification of groups of villages in economically backward areas.

Rural Cooperative Societies (OC) - Electrification of groups of villages joined in a cooperative system.

Mini Growth Centers (MG) - Electrification of several villages around a market town

Mini Health Centers (MH) - Electrification of several villages around a town with health center.

Minimum Needs Program (MNP) - Electrification of groups of villages out of a special GOI fund earmarked for specific backward areas.

(ii) Special Consumer Category Schemes:

Mini Industrial (MI) - Connection of village industry in a group of villages.

Mini Industrial Estate (ME) - Connection of small and medium industry in a rural industrial estate.

Mini Farm (MF) - Connection of irrigation pumps in a group of villages.

Mini Farm - Lift Irrigation (MF-LI) - MF connection for lift irrigation only.

Harijan Bastis (HB) - Electrification of lower caste settlements.

Special Loan - Industry (SPI) - Connection of small and medium industry in rural industrial estates (will replace MI and ME)

Special Loan - Agriculture (SPA) - Connection of irrigation pumps in groups of villages, co-financed by other institutions (will replace MF and MF-LI).

(iii) System Improvement and Reinforcement Schemes:

Special Transmission (ST) - Transmission lines to serve scheme and non-scheme areas in specific districts.

Special System Loan (SS) - System improvement by capacity increase and reinforcement of distribution system.

Special Loans (SL) - Financing workshop and production facilities for SEBs.

System Improvement (SI) - Replacing SS due to the creation of a separate fund by GOI.

Low Tension Capacitors (LT) - Installation of capacitors in a defined scheme area.

(iv) Other:

Single Wire Earth Return (MPS) - Experimental schemes using SWER technology.

Potential Scheme Area Advance (AL-PPA) - Advance loan for starting electrification of a scheme area with long gestation period, ultimately converted to area schemes.

Advance Loans for Annual Plan Purchases (AL:APP) - Advance Loan to enable the SEBs to make advance purchases of materials required for execution of rural electrification schemes pertaining to REC before the amounts for sanctioned or to be sanctioned schemes become payable during the year.

The terms of the loans associated with the above scheme categories and the viability criteria applied by REC until now are set out in Annex E.2.

INDIA
RURAL ELECTRIFICATION PROJECT
RURAL ELECTRIFICATION CORPORATION LTD.
REC LOANS - LENDING TERMS AND FINANCIAL CRITERIA AS OF OCTOBER, 1978

Loan Category	Normal Financial Outlay (Rs. in millions)	Period of Loan	Interest Rate ^{1/}		Loan Terms ^{2/}		Minimum Return For Project				
			Period	%	Grace Period	Repayment Period	Year (at the end of)	Net ^{3/}	Gross		
					Years	Years					
CA ^{4/}	7.5 - 8.0	20 years	1st 5 yrs	7.50	5	15	5th	(2%)	20% *		
			6-10 yrs	8.00							
			11-15 yrs	8.50							
			16-20 yrs	9.50							
OB	7.5 - 8.0	25 years	or		5	20	5th	(3.5%)	15%		
			11-15 yrs	8.00						If repayment in 15 yrs.	
			1st 5 yrs	7.00							
			6-10 yrs	7.50							
			11-15 yrs	8.00							
			16-20 yrs	8.50							
OC	15.0	30 years	or		5	25	5th	(3.5%)	15%		
			16-20 yrs	8.00						If repayment in 20 yrs.	
			1st 5 yrs	4.25							
			6-10 yrs	5.25							
			11-15 yrs	6.25							
			16-20 yrs	7.25							
ST/AB ^{5/} ST/AA	15.0**	12 years	1-12 yrs	8.00	2	10	7th	BE	Serve as basis for RE		
			10 years	1-10 yrs						8.00	8

No specific criteria but in assessing viability, the minimum standards applicable to backward areas are kept in view.

Schemes costing not less than the cost of ST scheme in MNP areas and not less than twice the cost of ST schemes in other than MNP areas before the end of the loan period in both cases.

INDIA
RURAL ELECTRIFICATION PROJECT
RURAL ELECTRIFICATION CORPORATION LTD.
REC LOANS - LENDING TERMS AND FINANCIAL CRITERIA AS OF OCTOBER, 1978

Loan Category	Normal Financial Outlay (Rs. in millions)	Period of Loan	Interest Rate ^{1/}		Loan Terms ^{2/}		Minimum Return For Project		
			Period	%	Grace Period	Repayment Period	Year (at the end of)	Net ^{3/}	Gross
MNP(O)	7.5 - 8.0	30 years	1st-10 yrs	6.00	5	25	5th	(6%)	10% ^{4/}
			11-20 yrs	6.50					
			21-30 yrs	7.25					
RMNP	7.5 - 8.0	30 years	1st-10 yrs	6.00	5	25	25th	BE	or 10% ^{5/}
			11-20 yrs	6.50					
			21-30 yrs	7.25					
SL	1.5	5 years	1-5 yrs	8.00	-	5	15th	BE	-
HB	1.5	15 years	1-15 yrs	5.00	-	15	25th	3.5%	-
SI	9.0	12 years	1-12 yrs	8.25	-	10	-	-	-
LT	5.0	5 years	1-5 yrs	8.00	2	5	7th	-	17.5%
SPA(1)	3.0	8 years	1-8 yrs	9.00	2	6	No viability criteria stipulated.		
SPA(2)	1.5 - 5.0	14 years	1-14 yrs	9.00	2	12	2nd	-	10%
SPI(1)	2.5	8 years	1-8 yrs	9.25	2	6	4th	-	10%
SPI(2)	4.0	14 years	1-14 yrs	9.25	2	12	2nd	-	15%
							4th	-	15%

NOTES:

- 1/ Interest rates shown are inclusive of the rebate of 1/4% allowed for prompt repayment.
- 2/ Repayment is by equal installment of principal. In all cases state governments are required to furnish full and unconditional guarantees in respect of the payment of interest and repayment of the principal by the State Electricity Boards/Co-operatives.
- 3/ Net return means the ratio of operating revenues (after providing for operating expenses including depreciation and interest) to total investment. Figures in brackets indicate negative returns. BE means Break Even.
- 4/ Direct loan assistance from REC is restricted to 60% of the project cost of the 2nd and subsequent 'OA' schemes from the same district in 'AA' states.
- 5/ ST projects in 'AB' states, i.e., states at or below the all India level of rural electrification.
- 6/ ST projects in 'AA' states, i.e., states at or above the all India level of rural electrification.
- 7/ Does not apply to the 'SS' schemes aimed at providing adequate power supply to the Rural Electric Co-operatives at 11 kv bus at proper voltage.

INDIA
RURAL ELECTRIFICATION PROJECT
RURAL ELECTRIFICATION CORPORATION LTD.
REC LOANS - LENDING TERMS AND FINANCIAL CRITERIA AS OF OCTOBER, 1978

NOTES (Contd):

- For only OA/OB/SU/MNP loans, gross return is adopted for determining the viability in the initial stages of the project; the second and subsequent stages of viability is determined on the basis of net return.
- Direct loan assistance from REC is restricted to 80% of the project cost except in the case of MNP areas, Mini Project areas and areas of operation of Rural Electric Co-operative Societies.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Project Title & Number: Rural Electrification 386-0462

Life of Project:
From FY 79 to FY 83
Total U.S. funding \$58 million
Date prepared May 8, 1979

Narrative Summary	Objectively verifiable indicators	Means of Verification	Important Assumptions										
<p>Program or Sector Goal: The broader objective to which this project contributes:</p> <ol style="list-style-type: none"> Increase production/income Expand employment opportunities in rural areas. 	<p>Measures of Goal Achievement:</p> <ol style="list-style-type: none"> Accelerated increase in ag. prod. over normal growth in scheme areas by 30%. Accelerated income growth somewhat higher than growth in ag. prod. because of increased non-crop agricultural activity. Accelerated increases in employment opportunities from irrigated agriculture and development of small-scale rural industry. 	<ol style="list-style-type: none"> REC evaluation studies. 	<p>Assumptions for achieving goal targets:</p> <ol style="list-style-type: none"> GOI maintains price policies favorable to farmers. Changed production practices are labor demanding rather than labor displacing. Agricultural inputs remain at reasonable rates. 										
<p>Project Purpose: Provide electrical energy for productive and social services to "backward" areas.</p>	<p>Conditions that will indicate purpose has been achieved: End of project status Approx. 17,000 villages electrified including: 50,000 pumpsets energized 7,000 commercial connections 241,000 domestic connections 3,000 industrial connections 30,000 street lights Total : 331,000</p>	<ol style="list-style-type: none"> REC and SEB records. 	<p>Assumptions for achieving purpose:</p> <ol style="list-style-type: none"> Credit available at affordable rates for agricultural inputs such as electric pumpsets. Farmers deem irrigated agriculture economically viable. Farmers willing to use electrical energy for irrigation. Pumpsets priced at reasonable rates. Consumer energy rates affordable. Connection charges affordable. 										
<p>Outputs: 1. Electrification infrastructure in place for MNP and SU project areas.</p>	<p>Magnitude of Outputs: 140 MNP projects 25 SU projects</p>	<ol style="list-style-type: none"> REC records SEB records 	<p>Assumptions for achieving outputs:</p> <ol style="list-style-type: none"> Adequate number of feasible sub-projects can be identified. SEB technical, organizational and management capability adequate for implementing sub-projects. 										
<p>Inputs: 1. AID Loan: \$58 million 2. GOI : \$58 million equivalent Total : \$116 million</p>	<p>Implementation Target (Type and Quantity): Disbursements (Millions US\$)</p> <table border="1" data-bbox="602 1161 1031 1224"> <thead> <tr> <th></th> <th>FY 80</th> <th>FY 81</th> <th>FY 82</th> <th>FY 83</th> </tr> </thead> <tbody> <tr> <td>AID</td> <td>1</td> <td>16</td> <td>31</td> <td>10</td> </tr> </tbody> </table>		FY 80	FY 81	FY 82	FY 83	AID	1	16	31	10	<ol style="list-style-type: none"> AID monitoring Sub-project accounts GOI vouchers 	<p>Assumptions for providing inputs:</p> <ol style="list-style-type: none"> GOI provides sufficient funds on timely basis.
	FY 80	FY 81	FY 82	FY 83									
AID	1	16	31	10									

INDIA
RURAL ELECTRIFICATION PROJECT
AVERAGE RATES FOR AGRICULTURAL^{1/}, INDUSTRIAL^{2/}, COMMERCIAL^{3/}, DOMESTIC^{4/}, CONSUMPTION

State Electricity Board	Rate in Paise per KWH (Duty / Tax Payable Shown in Brackets)							
	AGRICULTURAL		INDUSTRIAL		COMMERCIAL		DOMESTIC	
Andhra Pradesh	19.67	-	32.00 ^{7/}	(2.90)	75.00	(2.90)	40.00	(2.90)
Assam	18.00	-	22.00	(1.00)	57.00	(3.00)	48.00	(3.00)
Bihar	18.00	(0.36)	22.00	(5.00)	50.00	(10.80)	40.00	(10.00)
Gujarat	23.81	(1.20)	27.65	(3.30)	30.64	(8.40)	30.10	(7.33) ^{8/}
Harayana	23.68	-	24.00	(3.60)	40.00	(11.00)	34.75	(10.25)
Himachal Pradesh	9.00	(1.00)	21.84	(2.00)	48.00	(1.00)	37.50	(1.00)
Jammu & Kashmir/Kashmir	10.00	(1.50)	16.52	(2.48)	38.00	(3.88)	28.00	(3.08)
Jammu	10.00	(1.50)	22.03	(3.30)	38.00	(3.88)	28.00	(3.08)
Karnataka	18.68	(1.00)	18.65	(4.50)	50.60	(4.50)	33.33	(6.50)
Kerala	13.68	(1.37)	15.00	(1.50)	38.00	(3.80)	38.33	(2.50)
Madhya Pradesh	16.00	(2.50)	22.00	(4.00)	40.00	(10.50)	30.00	(9.00)
Maharashtra	22.00	(1.00)	25.00	(3.25)	40.00	(17.25)	31.00	(7.25)
Meghalaya	14.00	-	17.00	(2.00)	45.00	(2.00)	40.00	(2.00)
Orissa	15.00	(2.40)	18.00	(4.70)	31.00	(7.10)	28.00	(6.65)
Punjab	12.50	-	18.50	(6.48)	40.00	(14.80)	27.00	(14.37)
Rajasthan	21.00	-	23.00	(1.00)	50.00	(5.00)	38.00	(5.00)
Tamil Nadu	15.84 ^{5/}	-	31.00	-	68.50	-	35.00	-
Uttar Pradesh	22.06 ^{6/}	-	24.00 ^{6/}	(1.00)	51.00	(2.00)	41.00	(2.00)
West Bengal	32.00	(6.00)	32.00	(0.33)	55.00	(3.00)	45.00	(3.00)

SOURCE: Averages based on All India Electric Rate Book (Each State) updated as of March, 1978 by C. E. A.

^{1/} 5 HP, 10% Load Factor, 272 kwh per month.

^{2/} 10 HP, 15% Load Factor, 817 kwh per month.

^{3/} Lights and fans, 50 kwh per month.

^{4/} Lights and fans, 30 kwh per month.

^{5/} For small farmers average rate is 13.84 paise per kwh.

^{6/} Incentive of 50% to agriculture and 33% to industry is available in hill areas.

^{7/} Rate is 35 paise kwh for rice, oil, flour, ginning, decorticating, dal and gram mills, stone crushers, poultry farming units, Goshalas and such other units as may be specified by the SEB from time to time.

^{8/} Duty to rural areas at 5 paise kwh.

INDIA
RURAL ELECTRIFICATION PROJECT
STATEMENT SHOWING COST OF SERVICE CONNECTIONS TO SEB AND CONSUMERS
(Data in Rs.)

State	AGRICULTURAL			INDUSTRIAL			COMMERCIAL			DOMESTIC		
	SEB	Consumer	Total	SEB	Consumer	Total	SEB	Consumer	Total	SEB	Consumer	Total
Andhra Pradesh	235	125	360	255	189	444	100	-	190	100	-	190
Assam	-	1240	1240	-	1240	1240	-	420	420	-	420	420
Bihar	280	300	580	60	550	610	220	100	320	220	100	320
Gujarat	250	300	550	250	300	550	160	100	260	160	100	260
Haryana	530	-	530	700	-	700	175	60	235	175	60	235
Himachal Pradesh	-	-	-	580	-	580	195	-	195	195	-	195
Jammu and Kashmir	150	228	378	150	228	378	50	136	186	50	136	186
Karnataka	296	159	455	355	222	577	138	199	337	138	199	337
Kerala	880	-	880	1550	-	1550	540	-	540	540	-	540
Madhya Pradesh	200	300	500	200	450	650	75	125	200	75	125	200
Maharashtra	50	350	400	50	400	450	50	120	170	50	120	170
Manipur	400	200	600	400	200	600	100	100	200	100	100	200
Meghalaya	NA	NA	-	405	405	810	190	70	260	190	70	260
Orissa	200	200	400	200	200	400	70	50	120	70	50	120
Punjab	530	-	530	700	-	700	175	60	235	175	60	235
Rajasthan	500	750	1250	101	284	385	40	124	164	40	124	164
Tamil Nadu	580	-	580	360	190	550	160	70	230	160	70	230
Uttar Pradesh	140	90	230	505	115	620	215	55	270	215	55	270
West Bengal	160	600	760	440	320	760	136	164	300	136	164	300

Financial Viability of REC

1. REC's Capital Base

As of March 31, 1978, REC's total capital base amounted to \$664.6 million (Rs. 5,317 million) consisting of the following components:

		<u>(In million US \$)</u>
Share Capital (GOI owned)	-	83.75
GOI loans	-	377.00
REC bonds	-	51.75
Reserves and surplus	-	<u>152.13</u>
Total	-	<u>664.63</u>

As seen from the above figures, a little over half of REC's capital base is made up of GOI loans, which are a prime source of REC financing for its ever-increasing loan program. The GOI loans are made at varying interest rates from a low of 5.5% to 8.0% generally repayable in 15 equal installments with a moratorium for the first five years. These funds are in turn loaned to SEBs for the financing of projects which are appraised, approved, and monitored by REC. Slightly less than half of the capital base is made up of reserves and surplus, bond issues, and share capital. The REC's authorized share capital is \$125 million (Rs. 1,000 million) divided into 1 million equity shares of \$125 each. It is expected that the authorized share capital will be fully subscribed by the GOI and paid by 1981 or 1982. Bonds issued at 6% further augment REC's capital resources and are fully backed by the GOI. Subscribers are institutional investors, primarily commercial banks. The \$152 million in reserves and surplus includes the USAID grant and retained profits.

2. REC's Revenues and Reserves

Revenues are derived from the interest on REC loans to SEBs and investment returns of surplus cash in GOI Securities, Treasury Bills and SEBs' Debentures/Bonds. Revenues are used to meet administrative expenses and to pay interest owed on GOI loans and

on bonds issued. In the GOI's FY 1978^{1/}, REC's administrative costs and interest payments on GOI loans amounted to 7.6% and 61% respectively of its gross total revenues of \$31.3 million. (See Appendix 1 REC's income statement).

As a result of its expanding loan operations, REC's revenues continue to grow at a healthy rate - about 3.4 times that of what gross revenues were in 1974. Against a total value of approximately \$1.04 billion of loan assistance approved, REC has disbursed \$646.5 million of which \$628.6 remained outstanding. REC plans to disburse \$1.75 billion (Rs.11.8 billion) over the period 1979-83. (See Appendix 5 for details on Loans Sanctions & Disbursements.) After-tax earnings continue to rise building up REC's reserves strength. From its retained earnings, REC has been able to create a Special Development Reserve which has grown to \$7.4 million. These funds are used to: (1) provide special term loans to State Governments to assist them in subscribing to the share capital of Rural Electric Cooperatives, (2) provide grants to approved organizations for research and development, and (3) provide grants toward construction costs in specially underdeveloped areas. Income tax deductions, permissible under the Income Tax Act of 1961, are a source of additional reserve funds, the deduction accounting for about 25% of total profit. Based on the above discussion, REC's revenues generated are able to meet expenses and a surplus is even possible for special development purposes.

3. REC's Debt

The REC debt of \$428.7 million made up of \$376.9 million in loans owed to the GOI, and \$51.8 million in bonds issued amounted to 65% of total capitalization having gone from a low of 20% as recently as 1974. This increase over the last four years is mainly attributable to REC's expanding loan program requiring more and more GOI loan financing, a trend that is likely to continue into the future. REC's equity and reserves combined over the same period have also grown but at a lower rate at 34%. (See Appendix 2 for REC's Balance Sheets and Appendix 3 for Source & Application of Funds). Although REC's debt has risen more rapidly than its equity

^{1/} The GOI fiscal year commences on April 1 and ends March 31.

and reserves and is projected to rise further, its financial health ^{1/} is nevertheless considered satisfactory primarily because its loans to SEBs are guaranteed by State Governments for repayment. Although its debt service is increasing, REC will nevertheless be in a position to cover its annual debt amortization. (See Appendix 4 for Debt Service Coverage). Resources will continue to flow in from its investments, and from interest and loan repayments from SEBs. While this debt is projected to rise faster than revenues over the next five years, revenues are, however, anticipated to remain at no lower than 1.3 times the debt balance. Although this figure does not represent the ideal financial position which REC enjoyed in its earlier history (in 1974 for example when revenues were 2.6 times that of debt service) when its loan program was relatively small, the 1.3 figure is in keeping with the GOI minimum of 1.2. As a percentage of its capital base, REC's financial integrity will not be jeopardized in that the GOI will not permit REC to be in a position whereby revenues are less than 1.2 times the annual debt service and where administrative and interest costs exceed 90% of revenues in any given year. This notwithstanding it is expected that the GOI will offset projected debts by increasing its equity contribution to the present authorized limit and even perhaps beyond that.

4. Accounts Organization

REC has a competent accounts department, which operates basically a manual accounting system. However, management has recently introduced a number of computer applications which are operating concurrently with the manual system, in order to verify the correctness of the programs. In particular, the billing of interest and capital repayment charges to borrowers has been computerized. Considering REC's accounting growth, computerization should play an ever increasing role in the accounts function during the next five years.

^{1/} The projected increase in the debt equity ratio to a level of 82:18 in 1983 is comparable to ratios for similar financial institutions such as the Industrial Credit & Investment Corporation of India, 10:1, and Industrial Development Bank of India, 3:1.

INDIA
RURAL ELECTRIFICATION CORPORATION OF INDIA
BALANCE SHEETS FOR FISCAL YEAR 1974 THRU 1978 (ACTUAL) AND FISCAL YEAR 1979 THRU 1983 (PROJECTIONS)
(Data in millions of \$ Equivalent)

ASSETS	ACTUAL					PROJECTIONS				
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Fixed Assets	0.11	0.15	0.16	0.34	0.44	0.51	0.60	0.66	0.72	0.79
Less Depreciation	0.04	0.05	0.07	0.10	0.16	0.21	0.28	0.33	0.41	0.49
Net Fixed Assets	0.07	0.10	0.09	0.24	0.28	0.30	0.32	0.33	0.31	0.30
Investment in Govt. Securities	14.76	7.86	6.64	7.85	26.16	3.27	8.15	9.74	12.59	14.09
Loans Disbursed & Outstanding	205.31	302.84	393.51	497.88	628.63	810.28	1,052.04	1,313.49	1,613.31	1,945.44
Current Assets	3.96	4.79	5.82	6.78	22.84	16.54	21.21	26.33	31.68	38.38
Deferred Expenditure	-	0.14	0.30	0.45	0.57	-	-	-	-	-
Total Assets	224.10	315.73	406.36	513.20	678.48	830.39	1,081.72	1,349.89	1,657.89	1,998.21
Liabilities and Equity										
Equity and Reserves										
Share Capital	38.75	62.50	68.75	75.00	83.75	96.25	116.87	124.37	135.63	150.00
Capital Reserves	131.25	131.25	131.25	131.25	131.25	131.25	131.25	131.26	131.25	131.25
Retained Earnings	5.96	9.36	12.98	16.39	20.83	26.05	33.63	42.76	53.85	67.20
Total Equity and Reserves	175.96	203.11	212.98	222.64	235.83	253.55	281.75	298.39	320.73	348.45
Current Liabilities										
Sundry Creditors and Others	0.45	0.88	1.65	3.05	3.59	0.80	1.05	1.31	1.61	1.95
Provision for Taxation	3.53	4.10	4.76	4.90	9.46	4.50	6.39	7.71	9.40	11.36
Proposed Dividends	-	-	-	0.75	0.84	0.96	1.17	1.25	1.36	1.50
Total Current Liabilities	3.98	4.98	6.41	8.70	13.89	6.26	8.61	10.27	12.37	14.81
Borrowings										
G. O. I.	44.16	97.24	162.70	243.81	376.96	487.55	633.34	808.20	1,004.26	1,214.42
Market	-	10.40	24.27	38.05	51.80	83.03	158.02	233.03	320.53	420.51
Total Borrowings	44.16	107.64	186.97	281.86	428.76	570.58	791.36	1,041.23	1,324.79	1,634.95
Total Liabilities and Equity	224.10	315.73	406.36	513.20	678.48	830.39	1,081.72	1,349.89	1,657.89	1,998.21
Debt (Borrowed Money)/Equity Ratio	20:80	35:65	47:53	56:44	65:35	69:31	74:26	78:22	81:19	82:18

NOTE: Rate of Exchange: \$1.00 = Rs. 8.00

INDIA
RURAL ELECTRIFICATION CORPORATION OF INDIA
SOURCE AND APPLICATION OF FUNDS FOR FYs 1974-1978 (ACTUAL) AND 1 Ys 1979-1983 (PROJECTIONS)
(Data in millions of \$ Equivalent)

SOURCES	ACTUAL					PROJECTIONS				
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Internal Cash Generations										
Operating Income (After Interest Payments)	6.70	7.88	9.00	9.76	9.85	10.69	15.14	18.10	21.85	26.21
Depreciation	0.01	0.01	0.03	0.04	0.05	0.05	0.06	0.06	0.07	0.08
Total	6.71	7.89	9.03	9.80	9.90	10.74	15.20	18.16	21.92	26.29
Less Deductions:										
Income Tax Provision	3.57	4.10	4.76	4.90	4.56	4.50	6.39	7.71	9.40	11.36
Dividends	0.25	0.39	0.63	1.44	0.84	0.96	1.17	1.25	1.36	1.50
Total	3.82	4.49	5.39	6.34	5.40	5.46	7.56	8.96	10.76	12.86
Net Internal Generations	2.89	3.40	3.64	3.46	4.50	5.28	7.64	9.20	11.16	13.43
External Generations										
U. S. A. I. D. (Grant)	18.95	-	-	-	-	-	-	-	-	-
G. O. I. Equity Contributions	13.75	23.75	6.25	6.25	8.75	12.50	20.62	7.50	11.25	14.17
G. O. I. Loans	18.75	53.45	65.84	81.49	134.35	113.75	150.00	183.75	208.75	227.50
Market Loans	-	10.40	13.87	13.77	13.75	31.25	75.00	75.00	87.50	100.00
Repayment of REC Loans	0.11	0.26	1.05	5.88	10.50	18.35	26.99	32.30	37.65	42.90
Total External Generations	51.56	87.86	87.01	107.39	167.35	175.85	272.61	298.55	345.15	384.77
Working Capital (Increase)/Decrease	0.39	0.17	0.40	1.32	(10.86)	(0.76)	(2.32)	(3.46)	(3.24)	(4.27)
Sale of Govt. Securities	10.67	6.85	1.29	-	-	22.87	-	-	-	-
Total Sources	65.51	98.28	92.34	112.17	160.99	203.24	277.93	304.29	353.07	393.93
Applications										
Disbursement Against Loans Sanctioned	65.32	97.74	91.79	110.24	141.24	200.00	268.75	293.75	337.47	375.03
Investment in Govt. Securities	-	-	-	1.24	18.31	-	4.88	1.59	2.85	1.50
G. O. I. Loan Repayments	0.16	0.37	0.38	0.37	1.21	3.16	4.21	8.89	12.69	17.34
Capital Expenditures	0.03	0.04	0.01	0.17	0.10	0.08	0.09	0.06	0.06	0.06
Deferred Expenditure	-	0.13	0.16	0.15	0.13	-	-	-	-	-
Total Applications	65.51	98.28	92.34	112.17	160.99	203.24	277.93	304.29	353.07	393.93

INDIA
RURAL ELECTRIFICATION CORPORATION OF INDIA
STATEMENT SHOWING CALCULATION OF DEBT SERVICE COVERAGE FYs 1974-1978 (ACTUAL) AND FYs 1979-1983 (PROJECTIONS)
(Data in millions of \$ Equivalent)

	ACTUAL					PROJECTIONS				
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Total Revenue	9.21	11.96	18.32	24.58	31.32	45.25	60.62	79.49	100.85	125.07
Less Deductions:										
Admin. Expenses	0.91	1.18	1.46	1.86	2.39	2.37	2.62	2.94	3.25	3.75
Taxes	3.57	4.10	4.76	4.90	4.56	4.50	6.39	7.71	9.40	11.36
Dividends	0.25	0.39	0.63	1.44	0.84	0.96	1.17	1.25	1.36	1.50
Total Deductions	4.73	5.67	6.85	8.20	7.79	7.83	10.18	11.90	14.01	16.61
Net Revenue	4.48	6.29	11.47	16.38	23.53	37.42	50.44	67.59	86.84	108.46
Add:										
Depreciation	0.01	0.01	0.03	0.04	0.05	0.05	0.06	0.06	0.07	0.08
Loan Repayments by SEBs	0.15	0.26	1.04	5.87	10.50	18.35	26.95	32.30	37.65	42.90
Total Generations	4.64	6.56	12.54	22.29	34.08	55.82	77.45	99.95	124.56	151.44
REC's Debt Service:										
Int. on all Borrowings	1.60	2.90	7.86	12.96	19.08	32.19	42.86	58.45	75.75	95.11
Repayment of Loans	0.16	0.37	0.37	0.38	1.21	3.16	4.21	8.89	12.69	17.34
Total Debt Service	1.76	3.27	8.23	13.34	20.29	35.35	47.07	67.34	88.44	112.45
<u>Times Debt Service Covered</u> <u>by Internally Generated</u> <u>Funds and Sums Repaid by</u> <u>Borrowers (Minimum 1.2 Times)</u>	<u>2.6</u>	<u>2.0</u>	<u>1.5</u>	<u>1.7</u>	<u>1.5</u>	<u>1.6</u>	<u>1.6</u>	<u>1.5</u>	<u>1.4</u>	<u>1.3</u>

Annex H
Appendix

Statement Showing Amount of Loan Sanctions, Disbursements, and Balance Outstanding
(In millions of rupees except where otherwise stated)

Year to 31 March	Loans Sanctioned		Annual Rural Electr. Total	Disbursement of Loans Sanctioned									
	Accumulated Total	Harijan (aati)		ACTUAL			FORECAST						
				1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
1974	1,049.5	36.7	1,086.2										
1975	4,419.2	8.1	4,427.3	1,618.7	770.7	725.5	881.9	1,129.9	1,600.0	2,150.0	2,350.0	2,700.0	3,000.0
1976	5,509.2	-	5,509.2	25.0	11.2	8.8	-	-	-	-	-	-	-
1977	6,724.7	-	6,724.7	1,643.7	791.2	734.1	881.2	1,125.2	1,600.0	2,150.0	2,350.0	2,700.0	3,000.0
1978	8,301.3	-	8,301.3	208	34.0	285	279	397	650	750	850	950	1,000
1979	10,251.3	-	10,251.3	75	14	-	-	-	-	-	-	-	-
1980	12,451.1	-	12,451.1	618	958	1,263	1,522	1,919	2,419	3,029	3,679	4,409	5,209
1981	15,051.3	-	15,051.3	75	109	1,109	1,109	1,109	1,109	1,029	1,679	2,409	3,209
1982	18,151.3	-	18,151.3	739.9	1,170.0	1,170.0	1,135.5	1,576.6	1,950.0	2,400.0	2,600.0	3,100.0	3,950.0
1983	21,501.3	55.0	21,556.3	16.8	8.1	-	-	-	-	-	-	-	-
Total - Rural Electrification Loans - Harijan Banti				3,010.9	4,419.2	5,580.2	6,724.7	8,301.3	10,251.3	12,451.3	15,051.3	18,151.3	21,501.3
Total - Loan Disbursements				1,643.7	2,425.6	3,159.9	4,063.0	5,173.1	6,173.1	7,221.7	8,271.7	9,321.7	10,371.7
No. of Schemes Sanctioned During Year - Rural Electrification Projects - Harijan Banti Schemes				208	34	-	-	-	-	-	-	-	-
Total No. of Schemes Sanctioned to Date - Rural Electrification Projects - Harijan Banti Schemes				618	958	1,263	1,522	1,919	2,419	3,029	3,679	4,409	5,209
Loans Sanctioned During Year - Rural Electrification Projects - Harijan Banti Schemes				739.9	1,170.0	1,170.0	1,135.5	1,576.6	1,950.0	2,400.0	2,600.0	3,100.0	3,950.0
Total Loans Sanctioned to Date				3,010.9	4,419.2	5,580.2	6,724.7	8,301.3	10,251.3	12,451.3	15,051.3	18,151.3	21,501.3
Total Disbursements to Date				1,643.7	2,425.6	3,159.9	4,063.0	5,173.1	6,173.1	7,221.7	8,271.7	9,321.7	10,371.7
Loan Repayment During Year				0.9	2.1	0.4	17.0	86.0	116.8	215.9	250.4	311.7	443.7
Total Loan Repayment to Date				1.2	3.1	11.7	58.7	142.7	288.5	505.4	761.8	1,045.2	1,408.2
Loan Disbursements not Repaid				1,642.5	2,422.1	3,148.2	3,985.3	5,027.1	6,056.6	7,016.3	7,516.3	8,376.5	9,963.5
Unutilised Loans				1,397.2	1,993.6	2,429.1	2,662.9	3,179.6	3,479.6	3,529.6	3,779.6	4,119.6	4,429.6

RURAL ELECTRIFICATION - MWP SCHEME - VILLAGES 95 - PUMPS 1300
BLOCK NIWADI - TEHSIL NIWADI - DISTRICT TIRANGAR - MADHYA PRADESH

	Qty	Cost ₹	Conductors & cables Qty (km)	Cost ₹	Insulators Qty	Cost ₹	Transformers Qty	Cost ₹	Civil Works ₹	Miscel- laneous ₹	Meters #	Over- head ₹	Conti- nancy ₹	Labor ₹	Transpor- tation ₹	Total ₹	
11 KV LINE																	
48 sqmm ACSR conductor	104	3,029															
33 KV D.P. structure	18	524	40.3	16,931	312	1,846	-	-	373	2,140	-	1,466	732	1,609	999	29,125	
					72	936			403	906		159	79	238	175	3,500	
11 KV LINE																	
30 sqmm ACSR conductor	340	5,270															
20 " " "	510	7,905	105.4	29,670	1,020	960	-	-	1,148	4,700	-	2,511	1,256	3,850	2,012	51,375	
13 " " "	1,110	17,205	158.1	20,296	1,530	1,625	-	-	1,723	6,873	-	2,325	1,163	5,864	3,226	91,000	
11 KV D.P. structure	248	3,844	344.1	30,022	3,330	3,539	-	-	3,748	14,600	-	4,046	2,042	12,500	6,672	94,375	
					992	3,938			3,614	10,235		1,300	650	3,111	2,818	29,500	
11/0.4 KV DISTRIBUTION TRANSFORMERS																	
100 KVA	-	-	0.12	650	12	60	4	3,227	121	892	-	327	164	162	147	6,250	
63/50 KVA	-	-	2.61	12,837	237	1,170	79	60,539	2,382	17,513	-	5,628	2,870	3,111	2,575	108,625	
25 KVA	-	-	0.04	609	87	430	29	15,619	875	7,171	-	1,506	753	1,106	931	27,000	
h.f. LINE																	
3/4 wire, 16 sqmm AAC	6,525	101,137	1,796.55	154,303	26,100	6,743	-	-	21,625	52,029	-	20,342	10,171	58,725	26,100	431,375	
3/5 " " "	225	3,488	77.4	6,656	1,200	304	-	-	752	1,933	-	802	401	2,213	950	17,500	
1/3 " " "	675	10,463	139.5	11,993	1,800	489	-	-	2,212	3,104	-	1,706	853	5,743	2,812	79,375	
1/2 " " "	75	1,150	10.3	886	200	54	-	-	234	332	-	150	75	569	300	3,750	
SERVICES																	
Agriculture Pumps	-	-	-	-	-	-	-	-	-	1,516	3,448	171	85	850	430	6,500	
Industrial	-	-	-	-	-	-	-	-	-	54	154	7	3	21	11	250	
Domestic Light & Fan	-	-	-	-	-	-	-	-	-	513	871	11	6	313	161	1,875	
Street Light	-	-	-	-	-	-	-	-	-	218	-	10	5	11	6	250	
Grand Total	9,830	154,015	2,674.42	285,053	36,892	22,094	112	79,885	39,210	124,809	4,473	42,467	21,308	99,996	50,315	923,625	

• Includes fuse units, metering, lightning arrestors etc.
 * Includes crossarms, earthing & stay sets, clamps, nuts, bolts etc.
 # Includes wiring.

Environmental Assessment

Issues to be Addressed

A. Impact of Project Construction (Primary):

1. Factors in making route selection, e.g. consideration of existing vegetation, pole spacing, relation of villages, etc.
2. Establishment and clearing of right of way.
3. Installation of systems including transportation of poles and other items, pole digging, erection of poles, lifting of lines.
4. Maintenance of system.
5. Suitability of site and process with respect to future expansion.
6. Safety and aesthetic factors of above items.

B. Impact of Secondary Effects:

1. Agriculture/Irrigation (70% of load is for energization of pumpsets).
 - a. Change from new or increased water usage (general).
 - b. Change in soil-water, soil-vegetation relationships.
 - c. Effect of additional use of pesticides and fertilizer on surface and groundwater due to increased irrigation.
 - d. Any potential disease or new vector pattern by new or expanded water use.
 - e. Impact on groundwater recharge.
 - f. Potential for erosion.
 - g. Impact of agricultural technologies introduced (e.g. double cropping, new seed varieties, new crops, etc.)

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- h. Potential for pollution of domestic water supply by increased or new use of pesticides and fertilizer.
- i. Effect on employment from increased irrigation.
- 2. Domestic/commercial, street lighting, other.
 - a. Effect of employment.
 - b. Development of business and industry.
 - c. Requirement for additional infrastructure.
 - d. Population shifts.
 - e. Social benefits, e.g. public health, education, etc.

Environmental Assessment

The following information in response to Part I of this Annex is a condensation of that provided by and discussed with REC. Those areas under "Agriculture/Irrigation" have also been vetted with an AID water management specialist who affirmed the general conclusions.

A. Impact of Project Construction

1. Factors in making route selection, e.g. consideration of existing vegetation, pole spacing, relation of villages, etc.:

REC schemes follow a project approach and hence while formulating the scheme, as many villages as possible that have reasonable load potential are covered in the project. Normally 33 KV and 11 KV lines are laid so that they are close to the main/arterial roads connecting the major villages in the scheme area. The lines are laid close to the road from the point of view of transportation of poles, conductors, etc. during construction period and also from the convenience of maintenance once the line is commissioned. While laying the line, necessary care is taken to see that the line is located fairly distant from the road so that the avenue trees on either side of the road, if any, are not to be mutilated. Normally every effort is made to see that lines do not pass through garden lands and cutting of trees is avoided to maximum extent possible. It is only in hilly areas covered with forests that it becomes necessary to cut and prune some trees to the minimum extent required (to satisfy provisions of the Indian Electricity Act). Generally, the construction activity is taken up when there is no standing crop.

11 KV/.4 KV substations are generally mounted on double pole structures and need very little space. They are located at load centers. The substations to cater to the village proper is located at a suitable central place in the village. LT lines take off in different directions to cater the loads to the consumers from this point. In the case of substations catering to a group of pumpsets, the location is decided on the basis of technical suitability and physical acceptability. No difficulty has been faced in locating substations for this purpose in the field.

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The 400/230 V lines that are to be run inside the village to cater to the domestic/commercial consumers, will have to be run along the main stretch of the village as well as the bylands. Here again the alignment is so chosen that damage to fruit bearing trees is minimal. In the case of LT distribution line run from the transformer substation to the various pumping points, the layout is done in such a way so that it is most economical. Every care is taken to avoid the necessity of cutting or pruning any trees.

2. Establishment and clearing of right of way

Generally no difficulty is experienced in laying of transmission and distribution lines in the countryside. The Electricity Boards by statute have acquired the right to lay the lines in all public places and in lands owned by private parties, in public interest. If the lines have to pass through heavy wooded area, then the concerned Electricity Board has to get the approval from the Forest Department of the State Government, who will jointly examine along with the State Electricity Board a route which would result in minimal cutting of trees and finalize the alignment. Generally the Forest Department will clear the trees after the final alignment is decided making out a corridor to satisfy the requirements of Indian Electricity Rules.

3. Installation of system including transportation of poles and other items, hole digging, erection of poles, lifting of lines

The transportation of poles, in most cases, is done by trucks up to the point where the trucks can move and thereafter either by bullock carts or hand-carts. If there be standing crops or the terrain is such that even a hand-cart cannot approach the location where the pole is to be erected, it is manually carried to the location. Similarly, trucks, animal-drawn vehicles and hand-drawn carts are used for transportation of other materials of construction. In some cases, small items may even have to be carried on head. Digging of holes for poles is invariably done manually. Erection of poles is mostly done manually. Sometimes simple mechanical gadgets are used for this purpose. A couple of skilled linemen with the help of about a dozen unskilled workers erect the poles under the supervision of authorized supervisor. The stringing is in most of the cases done manually, the tension being adjusted based on the ground clearance.

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4. Maintenance of System:

a. Linemen Centers are located in villages and these serve either one or group of villages around the village where they are located, depending upon the consumers in the villages. They generally attend to fuse-off calls and other minor complaints.

b. The maintenance of line and substations is the responsibility of the lowest level unit office under whose jurisdiction the lines and substations come. These offices are held by an engineer with appropriate qualified maintenance staff.

5. Suitability of site and process with respect of future expansion:

In all REC schemes the system is designed to take care of growth of loads anticipated in the coming 5 to 10 years. Generally, as the REC has standardized the size of conductors to be used in the rural sector, there will be sufficient capacity availability in the 11 KV lines. To increase the capacity of the transformer centers would also not generally cause any problem. In some case it may become necessary to run 11 KV spur lines and establish additional transformer centers. In exceptional cases the load growth in a particular area may require establishing of a 33/11 KV substation so that the loads on the existing stations are bifurcated. These also would not generally pose any problem.

6. Safety and aesthetic factors of above items:

REC has standardised construction practices to satisfy the safety norms laid down in the Indian Electricity Rules. Care is taken while finalising the lay-out of the electrical distribution system that necessary norms etc. are provided as per I.E. Rules. Construction practices have also been standardised so that we are assured of the quality of work that has to be carried out. Generally the erection of PCC poles in the fields and in the villages do not mar the appearance of the area. However, precaution is taken to avoid locating the poles close to architectural and other historical features in such a way as to distract or mar their appearance. The transformer centers are also located in such a way that they merge with the background to the extent possible.

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B. Impact of Secondary Effects

1. Agriculture/Irrigation

a. Change from new or increased water usage (general)

In a study, post-electrification changes in the agricultural sector have been measured by adopting eight indicators viz., net sown area, cropping pattern, irrigated area, agricultural yield, agricultural inputs, agricultural implements, returns on agricultural investment and sales of agricultural produces.

Electrification of the villages made it possible for the farmers to install electric motors for irrigation which is cheaper. This has resulted in an overall increase in irrigated area of 0.86 ha per farmer.

The study further says that about half of the farmers have increased their irrigated area after installation of electric motors and/or oil engines. For most of the crops, yields of cultivators with either only electric motors or both electric motors and oil engines were higher than those of cultivators with only oil engines. Furthermore, in general yields of those with only electric motors were higher than those with both electric motors and oil engines.

In general, the productivity of all crops has increased and resulted in additional productions. Additional gross return per well, varied from Rs.6,163 in newly energized wells, to Rs.2,914 in old wells energized. The per hectare additional gross return as a consequence of energization varied from Rs.2,957 in government lift irrigation points, to Rs.5,412 under old wells converted. The same was Rs.3,117 for newly energized wells.

The adoption of advance agricultural practices with the help of electric pumpsets had had its own dis-economics though of a relatively minor magnitude in nature. Pre-irrigation practices included institutional dependencies between different communities in the village. For example, the cobbler in a village who attended to all the leather repair work of the mores and bullock-carts of the farmers found himself out of place when they were replaced by

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electric pumpsets and tractors. The blacksmith who again has been rendering similar assistance to the farmers found hard to earn his living under the new circumstances. It was also stated in certain instances that there have been cases of over-capitalization by farmers in the sense that pumpsets purchased and kept as stand-by while their utilization has been too poor and tractors which have been purchased for agricultural operations have been utilized for transport purposes using costly capital and imported fuel. Added to these are the instances where farm houses have sprung up in the middle of agricultural farms which originally started with a simple pump house. Though these cases are too few in nature, these dis-economics are out-weighed by the overall economic improvement in the rural situation.

b. Change in soil-water, soil vegetation relationships

There is certainly a relationship between the soil composition and water and soil vegetation and water. There have been isolated instances of increase of salinity especially in areas where large scale irrigation has been done with no proper drainage system. As and where necessary, the Government is planning for suitable drainage systems to counter these effects. In sum, only a minor effect on the soil is anticipated from the increased water.

c. Effect of additional use of pesticides and fertilizers on surface and groundwater due to increased irrigation

While an increase in fertilizer and pesticides is evident with the assured supply of groundwater, the overall use is still quite low in relation to land size. The use of fertilizer in India at the level of 20 kg of nutrients per hectare is quite low and does not have any significant adverse impact on surface and groundwater. It is highly unlikely that fertilizer or pesticide would percolate through to the groundwater level.

d. Any potential disease or new vector pattern by new and expanded use of water

There is no study available to indicate so but according to the life cycle of plant disease in India irrigation certainly provokes diseases. It is believed that expanded water use also makes changes in vector pattern, since moist conditions of the field allows different set of vectors to thrive. Plant diseases have been very well controlled in India by evolving disease resistance varieties and plant protection measures. Cost of plant protection measures are met by additional production.

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e. Impact of groundwater recharge

Since rural electrification is based on mainly groundwater utilization, it gives an opportunity to the farmer to utilize 30 percent more of the available water in a given area. The reasons assigned are the movement of groundwater being very slow there is normally 30 percent infiltration at the soil moisture zone in most of Indian soils. Thus, the total groundwater available in an area with respect to a well 30 percent more of annual recharge component. With regard to over exploitation of groundwater and drying up of wells, this is not being experienced as the total number of wells existing are far below the total feasible wells. Further, while formulating REC projects attention is paid to factors like depth of water table, seasonal fluctuations of water level, land holdings, cropping pattern and water requirement of various crops. Prior to any scheme being approved by REC, a certification must be included from a competent technical authority, such as the State Groundwater Organization, on the availability of groundwater to avoid overutilization of the aquifer.

f. Potential of erosion

Since the water drawn from a well/tubewell is used to the limited quantity required, it does not endanger soil erosion.

g. Impact of agricultural technologies introduced (e. g. double cropping, new seed varieties, new crops, etc.)

The study revealed that energization of farms has resulted in diversification of the cropping pattern and farmers are bringing more areas under crops of high economic return.

Further the study mentioned that utilization of manures has not increased much in the post-electrification period as compared to its use before electrification. This is an indication of farmers preference for chemical fertilizers in irrigated condition. It was found that the small farmers could not make use of modern agricultural technology to the extent desired in absence of supportive credit facilities. We recommend that an integrated approach with active participation of all departments of developmental agencies.

It is taken for granted that the success of rural electrification is reflected in the form of increase in cultivated area, predominance of crops of high economic return increase in the extent of irrigated

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land, higher yield and production, increased demand of improved seeds and fertilizer; improvement of agricultural implements, higher return on agricultural investment and increased marketed surplus.

The study pointed that substantial increase in net sown area and small but significant improvement in double cropped area are clear indications that under favorable price conditions farmers would undoubtedly further improve their production by bringing more and more areas under intensive cultivation.

However, the new crop varieties and the new practices have had more financial burden on the farmer in terms of his working capital requirements. To many farmers who are earlier happy with subsistence farming, these new technology have brought in altogether different dimensions to face. Timely availability or otherwise of credit, fertilizers, pesticides and seeds etc. influenced the benefits accruing through these new technologies.

i. Effect on employment from increased irrigation

Most of the wet crops like paddy and sugarcane have recorded an increase in net income in the post-electrification period. If we consider the individual crops the increase in per acre return was highest in the case of sugarcane (37.2%) and the maximum per acre return was for chillies (Rs. 4,065). This helped in increasing the employment opportunities for farm laborers on better wages. However, increased employment opportunities in the scheme areas are generally met by using existing unemployed and underemployed persons in these areas.

2. Domestic/Commercial, Streetlighting, Other

a. Effect on Employment

One of the goals of the RE program is to increase employment through rural industry. Since the emphasis of the program, however, is in the farming sector, this has less significance in overall impact. Nevertheless, studies do show the development of rural industry, often agriculturally related, though often small. There is no anticipation of adverse effects on the gradual employment generated in the non-agricultural sector.

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b. Development in business and industry

A study revealed that more than 90 percent of the income both in the pre and post-electrification periods was derived from the agriculture sector and for the remaining 10 percent service sector was the largest contributor. Another study indicated good scope for the introduction of power driven tools provided they were given the necessary training and financial assistance to produce them. Industries department should examine the various ways in which it can help artisans in this direction. The study pointed out that artisans were not averse to change and use of power driven tools provided it is practicable, profitable, and within their reach.

Artisans found in the sample villages are carpenters, blacksmiths, potters and weavers. Carpenters and blacksmiths have taken advantage of electricity and started small industries. A few of the carpenters have established saw mills and some of the blacksmiths have started general engineering workshops. Most of these are servicing units. Rural artisans of the sample villages provide an encouraging picture of willingness to switch over in power operated tools. There are a number of skilled persons among them who can be transformed into technicians with necessary training and financial support. Carpenters seem to be eager to switch over as they have realized the benefits of power operated technology.

There has been a positive impact on artisans from certain categories like weavers and carpenters. In other trades, there is no evidence of positive impact. There is need for a well conceived plan of action to promote use of power driven tools. Agriculturally growing areas such as the current study area offer most promising scope for artisan development programs in view of the growing demand.

c. Requirement for additional infrastructure

In a study it was found that all categories of farmers sold larger quantities of agricultural produce after electrification. There is, however, need to provide the small farmers with special supportive services for market because their need for ready cash is greater than large farmers and they are prepared to release marketable surpluses even curtailing their own consumption requirements. We

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recommend the special efforts for organized marketing of produce from small farmers be made by the departments concerned. Major infrastructure requirements are not necessary since there is not anticipated heavy concentration of industry in most scheme areas.

d. Population Shifts and e. Social Benefits

Village electrification is found to have association with density of population, though the correlation is not significant. Further village electrification is positively and subsequently correlated with length of roads, bank branches and educational institutions. It indicates the electricity is a motivating factor with development of all these infrastructure which certainly enables the shift of population towards the developed areas. However, every shift is gradual since the development process caused by electrification is gradual. A more significant result likely is the retention of people in the area i.e. a stopping of outward migration to more urban areas.

Scope of Work
Social Soundness Analysis for Rural Electrification
Project--India

Objective

To provide Mission with a socio-economic profile of beneficiaries of rural electrification within certain preselected schemes and to assist in preparing the social soundness section for the AID Project Paper.

Description

During U.S. fiscal year 1979, AID proposes to extend loan assistance to the Rural Electrification Corporation (REC) for on-lending to finance rural electrification projects in various Indian states.

REC was established in 1969 to help implement the Government of India (GOI) policy for accelerating rural electrification and to reduce regional disparities in the availability of electricity service. The REC, the largest single investor in rural electrification, lends to State Electricity Boards (SEBs) on a project basis, requiring projects to meet certain viability criteria and to be prepared and implemented in coordination with related aspects of rural development.

The primary thrust of these projects is the energization of pumpsets for irrigation purposes. Projects or schemes are classified based on socio-economic indicators including income, cropping patterns, size of land holdings, existing infrastructure, etc. and are approved by REC. Actual project design work, construction, and supervision are carried out by SEBs.

The Contractor shall address the following issues:

a. Social Consequences and Benefit Incidence

1. Percent of potential consumers receiving electricity.

2. Identification of beneficiary groups in selected schemes by category of consumer, i.e. agricultural, small industry, domestic/commercial and street lighting.

3. Identification of beneficiary (consumers and non consumers) by size of land holding (characterized under 2 hectares, 2-5 hectares, 5-10 hectares, over 10 hectares) for agricultural connections and income levels for all other consumer groups.

b. Access to Resources and Services

1. Affordability of electrical connections and rates to each potential consumer group, i.e. extent to which these costs are a constraint to receiving services. Cost of electricity to farmer: How does this compare to other inputs to the farmers?

2. Degree to which credit is extended for electrical connections.

3. Constraints on receiving connections other than cost of connection and monthly charges (e.g., awareness, administrative requirements, distance, etc.).

4. Potential for expansion of consumers within a scheme, particularly to poorer income groups.

c. Employment

Assessment of employment generation as a result of electrification for both agricultural and non-agricultural consumers.

Methodology

It is expected that the following approach will be applied although some variant to obtain the required information and analysis is acceptable:

1. Design and develop questionnaire to obtain data outlined above to be used in conjunction with field investigations and data collection.

2. Review and analyze existing local government records to assist in developing socio-economic profile of target population with the support of other references for cross-checking purposes.

3. Review existing socio-economic studies conducted by REC and others as component of the analysis of the beneficiary groups.

4. Conduct field investigation and in-depth analysis in selected representative schemes in three to four Indian states as determined by REC and USAID.

DRAFT
PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS
PART II

INDIA

Rural Electrification
A.I.D. Loan No. 386-T-225
A.I.D. Project No. 386-0462

Pursuant to Part I, Chapter I, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a Loan to the Government of India (the "Cooperating Country") of not to exceed fifty-eight million United States Dollars (\$58,000,000), 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 financing a number of rural electrification schemes in relatively economically disadvantaged areas throughout India with emphasis given primarily to the energization of pump-sets for irrigation and secondarily to household, street light, small-scale industry and commercial usages (hereafter called "the Project"). The entire amount of AID financing herein authorized for the Project will be obligated when the Project Agreement is executed.

I hereby authorize the initiation of negotiations and execution of the Project Agreement by the officer to whom such authority has been delegated in accordance with AID Regulations and Delegations of Authority subject to the following essential terms and covenants and major conditions together with such other terms and conditions as AID may deem appropriate:

a. Interest Rate and Terms of Repayment

The Cooperating Country shall repay the Loan to AID in United States Dollars within forty (40) years from the date of first disbursement of the Loan including a grace period of not to exceed ten (10) years. The Cooperating Country shall pay to AID in United States Dollars interest from the date of first

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

b. Source of Origin of Goods and Services

Except for ocean shipping, goods and services financed by AID under the Project shall have their source and origin in the Cooperating Country or in countries included in AID Geographic Code 941 except as AID may otherwise agree in writing. Ocean shipping financed under the Loan shall be procured in the United States and the Cooperating Country except as AID may otherwise agree in writing.

c. Conditions and Covenants

The Project Agreement shall contain a covenant to the effect that, except as AID may otherwise agree in writing:

Funds will be relent only to those State Electricity Boards (SEBs) which are eligible for IDA financing of rural electrification.

Name

Date

Draft Project Description for Loan Agreement

The purpose of the Rural Electrification Project is to provide electrical energy for productive and social services to "backward" areas. Achievement of the purpose is expected to contribute to the attainment of the goals of (1) an acceleration in the growth of agricultural production and hence incomes and (2) in the generation of employment opportunities. The Project's purpose will be accomplished by constructing schemes which will contain the infrastructure required for distributing electricity from existing grids to rural areas. The Project is expected to be completed by June 30, 1983.

The primary emphasis of these schemes will be on the energization of pumpsets for the development of groundwater resources for increasing agricultural productivity. Under these schemes secondary emphasis will be placed on the lighting of villages, the provision of electricity for making possible the development of small-scale, agro-based rural industries, and electricity for public street lights.

The Rural Electrification Corporation (REC) of the GOI is the principal organization responsible for the appraisal, approval and the provision of funds for the construction of schemes. Schemes are formulated and submitted by State Electricity Boards (SEBs) to REC in accordance with REC's established policies and guidelines concerning the technical, financial, and economic feasibility of the schemes. Schemes will be implemented by SEBs in accordance with sound engineering and construction practices.

REC and the SEBs will be jointly responsible for the monitoring of the progress of the construction of schemes and for the achievement of their estimated load growth targets. Such monitoring (with AID participation as required) will take place according to established practice.

The AID contribution (\$58 million) to the total Project cost will be used to finance the costs of certain equipment and materials required for the construction of these electrification schemes. The materials and equipment may include major items (transformers, conductors, insulators, meters) and minor items (L. T. cutouts, lightning arrestors, cross-arms, insulated wire, air break switches, and G.I. wire). Such materials are to be procured by the participating SEBs following AID procedures and will be used for installation in schemes primarily during the Indian financial years of 1980/1981 and 1981/1982. The schemes that will be eligible for financing shall have been approved for the period beginning April 1, 1977 through March 31, 1982.

5C(1) - COUNTRY CHECKLIST

Listed below are, first, statutory criteria applicable generally to FAA funds, and then criteria applicable to individual fund sources: Development Assistance and Security Supporting Assistance funds.

A. GENERAL CRITERIA FOR COUNTRY

1. FAA Sec. 116. Can it be demonstrated that contemplated assistance will directly benefit the needy? If not, has the Department of State determined that this government has engaged in consistent pattern of gross violations of internationally recognized human rights? Yes.

2. FAA Sec. 431. Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotics drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully? No.

3. FIA Sec. 620(b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the International Communist movement? Yes.

4. FIA Sec. 620(c). If assistance is to government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government? No.

5. FIA Sec. 620(e) (1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities? No.

5. FAA Sec. 620(a), 620(f); App. Sec. 107. (f). Is recipient country a Communist country? Will assistance be provided to the Socialist Republic of Vietnam, Cambodia, Laos, Cuba, Uganda, Mozambique, or Angola?
- No. No assistance will be permitted to these countries.
7. FAA Sec. 620(f). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression?
- AID is not aware of any such involvement.
8. FAA Sec. 620(f). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property?
- No.
9. FAA Sec. 620(f). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, inconvertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason?
- No.
10. FAA Sec. 620(o); Fishermen's Protective Act, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters,
- No such actions have been taken against U.S. fishing activities in international waters.
- a. Has any deduction required by Fishermen's Protective Act been made?
- No.
- b. Has complete denial of assistance been considered by AID Administrator?
- No.
11. FAA Sec. 620(g); App. Sec. 503. (a) Is the government of the recipient country in default on interest or principal of any AID loan to the country? (b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act appropriates funds, unless debt was earlier disputed, or appropriate steps taken to cure default?
- No.
12. FAA Sec. 620(s). "If contemplated assistance is development loan (including Alliance loan) or security supporting assistance, has the Administrator taken into account the percentage of the country's budget which is for military expenditures, the amount of foreign exchange spent on military equipment and the amount spent for the purchase of sophisticated weapons systems?" (An affirmative answer may refer to the record of the taking into account, e.g.: "Yes as reported in annual report on implementation of Sec. 620(s)." This report is prepared at the time of approval by the Administrator of the Operational Year Budget.
- Yes. India spends a relatively small amount of its foreign exchange on military equipment. Latest available figures are an estimated \$200 million military imports or 2% of \$7.5 billion in total foreign exchange in FY 79. India will spend only 16.5% of its central government budget on defense in FY 79/FY 80. India's military purchases include a variety of modern weapons systems, bought primarily from the U.K. and France.

Upward changes in the Sec. 620(s) factors occurring in the course of the year, of sufficient significance to indicate that an affirmative answer might need review, should still be reported, but the statutory checklist will not normally be the preferred vehicle to do so.)

13. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption? No.
14. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget? India is not in arrears regarding its U.N. obligations.
15. FAA Sec. 620A. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism? No.
16. FAA Sec. 666. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA? No.
17. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it detonated a nuclear device after August 3, 1977 although not a "nuclear-weapon State" under the nonproliferation treaty? Based on information received from the State Department Embassy the answer to both of these questions is no.
18. FAA Sec. 901. Has the country denied its citizens the right or opportunity to emigrate? No.

B. FUNDING CRITERIA FOR COUNTRY

1. Development Assistance Country Criteria

- a. FAA Sec. 102(c), (d). Have criteria been established, and taken into account, to assess commitment and progress of country in effectively involving the poor in development, on such indexes as: (1) small-farm labor intensive agriculture, (2) reduced infant mortality, (3) population growth, (4) equality of income distribution, and (5) unemployment.

Yes. These criteria are based on India's Five Year Development Plan (1978-83) and incorporated in Country Development Strategy Statement (CDSS).

b. FAA Sec. 104(d)(11). If appropriate, is this development (including Sahel) activity designed to build motivation for smaller families in programs such as education in and out of school, nutrition, disease control, maternal and child health services, agricultural production, rural development, and assistance to urban poor?

c. FAA Sec. 201(b)(5), (7) & (8); Sec. 209, 211(a)(4), (7). Describe extent to which country is:

- (1) Making appropriate efforts to increase food production and improve means for food storage and distribution.
- (2) Creating a favorable climate for foreign and domestic private enterprise and investment.
- (3) Increasing the public's role in the developmental process.
- (4) (a) Allocating available budgetary resources to development.
(b) Diverting such resources for unnecessary military expenditure and intervention in affairs of other free and independent nations.
- (5) Making economic, social, and political reforms such as tax collection improvements and changes in land tenure arrangements, and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.
- (6) Otherwise responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.

d. FAA Sec. 201(b), 211(a). Is the country among the 20 countries in which development assistance loans may be made in this fiscal year, or among the 40 in which development assistance grants (other than for self-help projects) may be made?

e. FAA Sec. 115. Will country be furnished, in same fiscal year, either security supporting assistance, or Middle East peace funds? If so, has Congress specifically authorized such use by law, or is assistance for population programs, humanitarian aid through international organizations, or regional programs?

Yes.

- c. 1. The Government of India has placed its highest development budget priority on agriculture and rural development with increased efforts in irrigation, dairy development, rural electrification research on high yielding seed, cottage industries, agricultural credit etc. India has recently agreed with the World Bank(IDA) on a grain storage project to construct an additional 3.6 million tons of storage capacity and is beginning to plan another 1.5 million tons of storage with future assistance from other donors.
2. India welcomes foreign private investment in priority areas involving needed technology or production for export. Domestic private investment in India's mixed economy is encouraged.
3. The present Government emphasizes decentralization of decision-making and is promoting greater state and local involvement in the development process.
4. a & b. In recent years, Government of India defense expenditures have declined as a percentage of the total central government budget. Proportionally more funds have been available for development purposes. India is not intervening in other free countries' affairs.
5. Democratic elections in March 1977 restored full political liberties, a free press, an independent judiciary, and respect for human rights.
6. The present government has a strong commitment to improving the lives of India's poor through a strategy of rural based employment opportunities and agricultural development. FY 1980 budget has a strong rural bias.

d. India is in both of these groups.

No.

4. Security Supporting Assistance Country
Criteria

- a. FAA Sec. 5029. Has the country engaged in a consistent pattern of gross violations of internationally recognized human rights? Is program in accordance with policy of this Section? Not applicable.
- b. FAA Sec. 531. Is the Assistance to be furnished to a friendly country, organization, or body eligible to receive assistance? Not applicable.
- c. FAA Sec. 533(c)(2). Will assistance under the Southern African Special Requirements fund be provided to Mozambique, Angola, Tanzania, or Zambia? If so, has President determined (and reported to the Congress) that such assistance will further U.S. foreign policy interests? Not applicable.
- d. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made? Not applicable.
- e. App. Sec. 113. Will security assistance be provided for the purpose of aiding directly the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights? Not applicable.
- f. FAA Sec. 620B. Will security supporting assistance be furnished to Argentina after September 30, 1973? Not applicable.

5C(2) - PROJECT CHECKLIST

Listed below are, first, statutory criteria applicable generally to projects with FAA funds, and then project criteria applicable to individual fund sources: Development Assistance (with a sub-category for criteria applicable only to loans); and Security Supporting Assistance funds.

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

A. GENERAL CRITERIA FOR PROJECT.

1. App. Unnumbered; FAA Sec. 653(b); Sec. 671
 - (a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project;
 - (b) is assistance within (Operational Year Budget) country or International organization allocation reported to Congress (or not more than \$1 million over that figure
 - a. Formal notification to Congressional Committees was given in AID's FY 79 Congressional presentation.
 - b. Yes.

2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance? Yes.

3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance? None needed.

4. FAA Sec. 611(b); App. Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per *the Principles and Standards for Planning Water and Related Land Resources* dated October 25, 1973. Not applicable.

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

6. FAA Sec. 209, 619. Is project susceptible of execution as part of regional or multi-lateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. If assistance is for newly independent country, is it furnished through multi-lateral organizations or plans to the maximum extent appropriate? Project is parallel financed with World Bank as part of multilateral effort. AID's contribution is complementary to IDA's.

7. FAA Sec. 601(a); (and Sec. 201(f) for development loans). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.
8. FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).
9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.
10. FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?
11. ISA 14. Are any FAA funds for FY 78 being used in this Project to construct, operate, maintain, or supply fuel for, any nuclear reactor under an agreement for cooperation between the United States and any other country?

FINDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria
 - a. FAA Sec. 102(c); Sec. 111; Sec. 361a. Extent to which activity will (a) effectively involve the poor in development, b. extending access to economy at local level, increasing labor-intensive production, spreading investment out from cities to small towns and rural areas; and (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions?

Project is not directly applicable to foreign trade. It will expand and strengthen the private sector. It will encourage the extension of credit institutions to rural areas. By providing electricity irrigation, agricultural production will improve to develop groundwater. The project is not directed towards labor unions.

The project is not expected to directly foster U.S. private trade and investment abroad.

The AID funds are being matched by GOI funds on the basis of 50% AID and 50% GOI. India is contributing sufficient amounts of local currencies for contractual and other services. (See item 10 for U.S. owned currencies.)

The U.S. owns Indian rupees that are being used for various U.S. Govt. agencies program and administrative support and these currencies are expected to be liquidated for current ongoing activities over the next decade. A decision by the Development Coordinating Committee (DCC) on Dec. 21, 1977 determined that local costs of selected projects in India would be financed by dollar appropriation for FY 78 & FY 79, not by U.S. owned local currency.

11. No.

1. a. Project construction for providing electrification infrastructure (transformers, conductors, insulators, poles*) will be labor intensive. Projects are located in rural areas and will benefit small farmers.

* poles not financed by AID.

b. FAA Sec. 103, 103A, 104, 105, 106, 107. Is assistance being made available: [Include only applicable paragraph -- e.g., a, b, etc. -- which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.]

Project is specifically designed to increase agricultural production and incomes among the rural poor through the provision of increased exploitation of groundwater irrigation.

- (1) [103] for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; [103A] if for agricultural research, is full account taken of needs of small farmers;
 - (2) [104] for population planning or health; if so, extent to which activity extends low-cost, integrated delivery systems to provide health and family planning services, especially to rural areas and poor;
 - (3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development;
 - (4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is:
 - (a) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;
 - (b) to help alleviate energy problem;
 - (c) research into, and evaluation of, economic development processes and techniques;
 - (d) reconstruction after natural or manmade disaster;
 - (e) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;
 - (f) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.
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(5) [107] by grants for coordinated private effort to develop and disseminate intermediate technologies appropriate for developing countries.

c. FAA Sec. 110(a); Sec. 208(e). Is the recipient country willing to contribute funds to the project, and in what manner has or will it provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

d. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"?

e. FAA Sec. 207; Sec. 113. Extent to which assistance reflects appropriate emphasis on; (1) encouraging development of democratic, economic, political, and social institutions; (2) self-help in meeting the country's food needs; (3) improving availability of trained worker-power in the country; (4) programs designed to meet the country's health needs; (5) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (6) integrating women into the recipient country's national economy.

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

The Government of India is contributing approximately 50% of the total project cost.

Not applicable.

The project directly contributes to the country's self-help efforts to increase food grain production and meet its own needs. The project does not contribute directly to areas under items (1), (3), (4)&(5), but insofar as incomes will rise from increased production and provide opportunities for a better quality of life, there is likely to be indirect effects on these areas. Women will be integrated into the national economy in that greater employment opportunities will be provided to them.

The project addresses the need for increased food production and will minimize the risks of drought periods through the development and energization of the groundwater irrigation systems. Institutional development will be fostered insofar as the host country's implementing agencies will acquire a strengthened capability to develop and administer an effective rural electrification program for the benefit of the rural poor.

g. FAA Sec. 201(b)(2)-(4) and -(8); Sec. 201(e); Sec. 211(a)(1)-(3) and -(5). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth; or of educational or other institutions directed toward social progress? Is it related to and consistent with other development activities, and will it contribute to realizable long-range objectives? And does project paper provide information and conclusion on an activity's economic and technical soundness?

h. FAA Sec. 201(b)(6); Sec. 211(a)(5), (6). Information and conclusion on possible effects of the assistance on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance-of-payments position.

2. Development Assistance Project Criteria
(Loans only)

a. FAA Sec. 201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within U.S.

b. FAA Sec. 201(b)(2); 201(d). Information and conclusion on (1) capacity of the country to repay the loan, including reasonableness of repayment prospects, and (2) reasonableness and legality (under laws of country and U.S.) of lending and relending terms of the loan.

c. FAA Sec. 201(e). If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds \$100,000, has country submitted to AID an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?

d. FAA Sec. 201(f). Does project paper describe how project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development?

The project contributes directly to increasing agricultural production by energizing groundwater resources for irrigation purposes. The project also aims at contributing to the growth of village and cottage industries. The rural electrification schemes are designed according to technical, economic and financial viability criteria. The Project Paper concludes that the project is technically and economically sound.

There will be no adverse effects on the U.S. economy.

Sufficient funds will be made available from AID & the World Bank/IDA. AID is not aware of interest in financing from other free-world sources including private sources in the U.S.

India's foreign exchange earnings continue to grow. The loan will create increased potential for production the proceeds from which will contribute to loan repayment. Funds will be extended in compliance with Indian and U.S. sources and under AID's concessional rates.

Yes.

Yes.

e. FAA Sec. 202(a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources?

Not applicable.

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

Not applicable.

3. Protect Criteria Solely for Security Supporting Assistance

a. FAA Sec. 531. How will this assistance support promote economic or political stability?

Not applicable.

b. FAA Sec. 533(c)(1). Will assistance under *The Southern African Special Requirements Fund* be used for military, guerrilla, or paramilitary activities?

Not applicable.

4. Additional Criteria for Alliance for Progress

Not applicable.

[Note: Alliance for Progress projects should add the following two items to a project checklist.]

a. FAA Sec. 251(b)(1), (B). Does assistance take into account principles of the Act of Bogota and the Charter of Punta del Este; and to what extent will the activity contribute to the economic or political integration of Latin America?

b. FAA Sec. 251(b)(3); 251(h). For loans, has there been taken into account the effort made by recipient nation to repatriate capital invested in other countries by their own citizens? Is loan consistent with the findings and recommendations of the Inter-American Committee for the Alliance for Progress (now "LEPCIES," the Permanent Executive Committee of the OAS) in its annual review of national development activities?

Not applicable