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COMPLETION REPORT  
RURAL ELECTRIC COOPERATIVES

Contract No. AID/csd-1504 T. O. 11

September 1966 - June 30, 1973

Part One: Narrative Report

SUMMARY

In the context of seed-fertilizer revolution in India, rural electrification assumed special importance in the utilization of ground water for irrigation, the processing of agricultural products and brightening up the country life. This led to a request from the GOI for the USAID assistance in the establishment of five pilot Rural Electric Cooperatives and the Rural Electrification Corporation (REC) as a financing agency for the cooperatives and the State Electricity Boards.

With the work and guidance of the U.S. specialists provided by the National Rural Electric Cooperative Association (NRECA), the five cooperatives started functioning in 1970-71. In less than three years, they have grown in a varying degree, with their performance comparing favorably with the respective State Electricity Boards. At the end of the five year period the five cooperative projects are expected to provide electricity for 795 villages, establish a network of 12,000 kilometers of high and low tension lines and serve over 100,000 consumers. The objective is also to provide electricity

to operate 39,000 pumpsets and establish 2,500 agro-based industrial units as well as making 64,000 domestic and commercial connections.

The USAID provided funds under a contract to make available six technicians to assist in the development of the five pilot cooperatives for a total of 179 man-months and a total of 29 management and engineering participants that received training. The U.S. Government contributed Rs. 1,050 million of PL-480 funds as a grant for the Rural Electrification Corporation and Rs. 2,486,000 for the five pilot projects.

The working of the five Pilot Projects have clearly brought out the advantages of the Rural Electric Cooperatives as a supplementary effort to the State Electricity Boards, and provided a yardstick for improving construction designs and management practices; reducing the cost of operations, line losses, staffing patterns; providing better services to consumers, raising the standard of living in the areas and the means of increasing agricultural production. This project has given thorough insight into the weaknesses and typical problems of rural electrification, in respect to engineering, organization, construction, operations, maintenance, administration, safety measures, job trainings and liaison among various agencies. The overall conclusion is that it is feasible to have Rural Electric Cooperatives and it is desirable to expand their number. The fact that the GOI has planned to organize at least five Rural Electric Cooperatives during 1973-74 and 100 such Cooperatives in the Fifth Plan, gives solid indication of the success this project has achieved.

The following tables provide a summary of the accomplishments of the Rural Electric Cooperatives:

## I INTRODUCTION

### Historical Background

At the beginning of 1965 the State Electricity Boards had provided electric service to less than 10% of rural India. The main objective was the lighting of villages and rural homes. As early as 1949, small electric generating and distribution cooperative societies were organized in India. Some failed to survive and only a small number were in operation in 1965.

The severe strain on the Indian economy during 1965-67 brought about by two consecutive seasons of widespread crop failure focused the attention of the nation on the urgent need to increase production. At this time a new agricultural strategy was evolved for increased production by using more fertilizer and high-yielding varieties of seeds and a massive exploitation of ground water potential. In this context, rural electrification assumed a new significance for servicing the agricultural production programs. Since 1966-67, the program of rural electrification has been geared to agricultural production.

The officials of the GOI were aware of the development of Rural Electric Cooperatives in the United States which began in 1935. They contacted USAID for assistance. The NRECA International Global Program Division was asked to send Rural Electrification Specialists to India to make studies for the expansion of rural electrification.

The NRECA began a Phase I study in September 1966 to determine whether the climate was favorable for establishing rural electric cooperatives. The NRECA Team recommended that five pilot rural electric cooperatives be established and named their choice of the five most desirable locations. The GOI accepted the recommendations of NRECA and appointed an ad hoc committee on July 17, 1967 to organize the five pilot projects. The report of the Phase I studies recommended that a central organization was necessary for providing financial and technical assistance to electric distribution systems and that new methods for management and operation of local systems were required to improve service and assure viability through a cooperative pattern of organization and management.

In July 1968, Phase II Organization and Phase III Engineering began for the five pilot cooperatives in Sircilla of Andhra Pradesh State, Hukeri of Mysore, Rahuri of Maharashtra, Kodinar of Gujarat and Lucknow of Uttar Pradesh.

In December 1968, the GOI All-India Credit Review Committee recommended that a Rural Electrification Corporation be organized as a financing agency for Rural Electrification Systems. This leading Agency was proposed to provide loans at relatively low rates of interest to rural electric cooperatives and intensive rural electrification systems of state electricity boards.

The Rural Electrification Corporation was officially registered on July 25, 1969. The U.S. Government agreed to grant Rs.1,050 million of PL-480 funds in payment over a five year period and the GOI was to contribute Rs.450 millions in share capital and loans to establish

the Corporation. The functions of the Corporation were to finance and provide technical assistance for intensive rural electrification. From the outset, the Corporation had a special interest in Cooperatives as a better method for organization and management of rural electric systems.

The five ad hoc Committees had completed the basic preparation for the final organization of the Pilot Rural Electrification Projects by July 1969. USAID requested the NRECA to send a team of five rural electrification specialists to India to implement Phase IV which provides for the completion of the organization, construction, energization and development of the five electric cooperative distribution systems.

## II PILOT RURAL ELECTRIC COOPERATIVES

When the NRECA Rural Electrification Specialists arrived in India on September 22, 1969 they soon discovered that the ad hoc Committees had not completed the organization of the Pilot Projects. The specialists guided the final organization during the next year. The Hukeri Cooperative in Mysore State began operation on October 12, 1970, the Sircilla Cooperative in Andhra Pradesh on November 1, 1970, and the other three began operations in early 1971. All five Cooperatives followed the same general plan and have grown in varying degrees. A uniform growth in connected consumers energy sales, revenue and lines in operation has been achieved by the Hukeri Cooperative. The Sircilla Cooperative has constructed more lines and connected more consumers than the other Projects. The construction of new lines by the Lucknow Cooperative almost reached its target and enjoyed an increase in energy sales. The

largest project, Mula-Pravara Cooperative, has devoted most of its efforts to the rehabilitation of its system and reducing line losses. The smallest project, Kodinar, has constructed an acceptable amount of lines but has been slow to connect new consumers.

The total cost of the five projects is estimated at Rs.12.81 Crores, of which the value of assets taken over from the SEB is Rs.3.2 Crores, the cost of new construction to be undertaken by the Cooperative is Rs.9.61 Crores. Implementation of these projects is phased over a period of 5 years. At the end of this period all the five projects are expected to cover 795 villages, have a network of 12,000 Kms. of HT and LT lines and serve over 100,000 consumers - about 39,000 pumpsets, 2,500 agro-based industrial units, and 64,000 domestic and commercial connections.

#### A. Hukeri

##### 1. Description

The Hukeri Electric Cooperative Society is located in the northern part of Mysore State in an agricultural area. It has a license to provide electric service to the entire Hukeri Taluka. The Project, when completed at the end of five years, will serve 121 villages over a network of 1317 Kms. of lines, and connect 14,092 consumers at an overall investment of Rs.173.4 lakhs.

##### 2. Accomplishments

The Hukeri Cooperative has grown in a normal manner with less problems than the other pilot projects. Much credit goes to its dedicated Board of Directors and Manager.

During the first 30 months of operation 305 Kms of distribution lines were constructed and 3,015 new connections were connected to the electric system. The earned margin during this period was Rs.91,437.16, whereas the project scheme predicted a loss of Rs.185,400.

The Society has just recently obtained a reduction in the purchase rate permit from 7.4 paise to 5.5 paise. This should enable this cooperative to continue to earn operating margins.

A new headquarters building will be completed in 1973.

The members elected a Board of Directors during the early part of 1973, whereas all other Boards are named by the State Registrars of Cooperative Societies.

The accounting system and records at Hukeri appear to be the best of the Pilot Projects.

### 3. Future Concerns

#### A. General (applicable to all cooperatives)

The principal future concerns of Rural Electric Cooperatives in India are:

a. Line losses must be reduced. This may be accomplished by improving construction and system maintenance, installing meters in tamper-proof boxes and a continuous program for testing meters.

b. Staff members must be employed by the Cooperatives. The practice of deputing employees should be stopped. The REC should begin a training program for key staff members.

c. Construction standards for economical rural distribution systems should be redeveloped to lower construction costs and maintain acceptable standards of electrical supply.

(d) Member services and job training and safety programs are urgently needed.

(e) Share capital has been paid by only a small percent of the original consumers. Each consumer should become a member of the cooperatives.

(f) Power supply - All projects have suffered from power cuts and restrictions. This is one of India's National problems and was particularly serious during 1972-73. Generation must be increased and heavy transmission lines are required.

(g) Delinquent Consumer Accounts - Strict collecting policies must be established. A general drought has been the excuse of consumers for not paying electric bills.

#### B. Special Hukeri Concerns

(a) Wood Poles - Approximately 4,000 wood poles were supporting lines which were purchased from the State Electricity Board. These poles were not treated and must be replaced as soon as possible.

(b) System Maintenance - The Society continues to delay necessary maintenance and rehabilitation of its system.

(c) Progress is retarded by an overly conservative management policies.

#### B. Kodinar

##### 1. Description

The Kodinar Rural Electric Cooperative Society is located at the Southern tip of Gujarat State in a progressive agricultural area along the Arabian Sea. The completed project is expected to serve 107 villages with a network of 1,345 Kms. of lines and connect 19,167 consumers with an overall investment of Rs.183.12 lakhs at the end of five years.

## 2. Accomplishments

The performance of the Kodinar Cooperative has not been outstanding due to power supply restrictions, financial losses caused by unfavorable tariff for bulk power and the scarcity of poles. In spite of these handicaps, creditable accomplishments have been made.

During the first 26 months of operation 234 Kms. of lines were constructed and 2664 new service connections were made. There has been a gradual increase in energy sales and revenue from the first month of operation. The average line losses are 24.7% which is the lowest of the five cooperatives.

All construction has been by contract which has resulted in approximately 10% reduction in the cost of lines.

The consumers of this cooperative feel that rural electric cooperatives are able to adjust to their needs more quickly and easily than the State Electricity Board.

Uttar Pradesh State has contributed Rs. 200,000 to the Society.

## 3. Future Kodinar Concerns

In addition to the general concerns of all cooperatives, this cooperative urgently needs to construct a headquarters building and quarters for staff personnel, a full-time general manager, transportation vehicles, the connection of consumers along existing lines and an increase in the tempo of construction.

## C. Lucknow

### 1. Description

The Cooperative Electric Supply Society Ltd. is located adjacent to the City of Lucknow in Uttar Pradesh State. The project serves an industrial area and an extensive agricultural area. The Project, at the end of five years, has a target to serve 241 villages with a network of 1693 Kms. of lines and connect 12,628 consumers with an overall investment of Rs. 242.65 lakhs.

## 2. Accomplishments

The Lucknow Cooperative appears to be the average or medium of the five pilot projects. It has met its construction targets and ranks second in energy sales, due to its industrial loads.

During the first 27 months of operation 550 Kms. of lines were constructed and 2137 new consumers were connected. The average line losses to date is 26.25% which is the second lowest of the Pilot Projects.

This is the only cooperative that has succeeded in associating various developmental agencies with its activities. It works with the District Program Coordination Committee and is represented at all meetings of the Block Development Officers.

This Society was the first to publish a news letter.

A complete work order system has been developed and lines are staked before construction begins.

## 3. Future Lucknow Concerns

In addition to the general concerns of all cooperatives, the financial viability of this cooperative is threatened by an increase in wholesale energy cost from 10 to 13 Paise per unit; twenty transformers have been stolen from energized lines, the number of personnel must be reduced from its present number of 500, increase the tenure of service for deputed managers and the need for better relations and understanding between the Board of Directors and the General Manager.

## D. Mula Pravara

### 1. Description

Mula Pravara is the largest Pilot Project. It is located in the Rahuri and Shrirampur Talukas of Maharashtra State. The project area

is a part of one of the most productive sugarcane areas in India. Its load is 77% agricultural.

The Project at the end of five years has a target to serve 167 villages with a network of 4,192 Kms. of lines and connect 23,765 consumers with an overall investment of Rs.385.6 lakhs.

## 2. Accomplishments

This Cooperative encountered serious problems during its first year of operation. The system losses were 60%. Internal strife among the Board Members threatened the continuation of the Project. The lines which were purchased from the SEB required extensive rehabilitation. The operating loss during the first year of operation was Rs.18.21 lakhs.

During the first 25 months of operation 305 Kms. of lines were constructed and 3,142 new consumers were connected.

During the second year of operation the line losses were reduced from 60% to 35%, operating losses were reduced from Rs.18 lakhs to Rs.4 lakhs, major system rehabilitation and improvements were made, a tentative agreement for reducing the wholesale cost of energy from 9 to 6.7 Paise per unit and the administration has materially improved under the supervision of an appointed administrator.

## 3. Future Mula Pravaya Concerns

In addition to the general concerns of all cooperatives, this project must reduce the theft of electric energy by its consumers, implement an accelerated construction program, obtain key staff personnel on a permanent status and reduce line losses to approximately a maximum of 25%.

## **E. Sircilla**

### **1. Description**

The Cooperative Electric Supply Society Ltd. is located in Sircilla Taluka in Andhra Pradesh State. Its energy sales to agriculturists was 82% of its entire sales. This Project is considered the best all-around Pilot Project. The target at the end of five years is to serve 173 villages, with a network of 2435 Kms. of lines and connect 24,476 consumers with an overall investment of Rs.295.94 lakhs.

### **2. Accomplishments**

This cooperative is the only one that has received any appreciable donated labor and services from its members. These donations have reduced the costs of new lines at least 5%. This Cooperative has constructed the most lines and has connected the largest number of new services.

During the first 29 months of operation 1,285 Kms. of lines were constructed and 7,301 new consumers were served. This Society has collected more share capital than any of the Pilot Projects.

The Cooperative's reinforced concrete pole manufacturing plant has supplied the pole requirements at a substantial saving.

Land was acquired for a headquarters building and a 40' x 120' warehouse building has been completed.

The performance of the Board of Directors, General Manager and Chief Electrical Engineer has been exceptional.

The Cooperative enjoys the support and confidence of its members and the general public.

This is the only Project that has ordered and is installing two-way radio communications equipment.

F. General

1. Role of Management Specialists

The NRECA management specialists have played a vital role in the development of the Pilot Projects. They had played a part in the development of Rural Electric Cooperatives in the United States and developing countries throughout the world. Each specialist made important contributions in the areas of engineering, organization, office procedures and accounting, construction, operations, maintenance, public and member relations, Board - Manager relations, introduction of new materials and tools, construction standards and practices, safety and job training and served as liaisons among the Cooperatives, USAID, State Governments, the GOI and the Rural Electrification Corporation (REC).

The work and guidance of the NRECA specialists enabled the cooperative to complete their organization and begin operations within one year after their arrival in India.

2. Role of Participant Trainees in the Cooperatives and in the SEB's

The Phase I study of NRECA recommended that the key personnel of the Cooperatives, the Rural Electrification Corporation, the Ministry of Irrigation and Power and the State Electricity Boards should visit the United States and attend a 15 week Training Seminar on the administration of Rural Electric Cooperatives. The Managers and engineers of the Pilot Projects attended this seminar in 1969. In 1970 another group from the GOI and the State Electricity Boards attended this seminar. A total of 29 participants attended the 1969, 1970 and 1971 seminars.

The participants visited Rural Electric Cooperatives in the U.S. and have adopted many of their management and engineering practices.

The SEB participants have adopted the use of materials and tools which they saw in the U.S. This is resulting in a slow modernization of the SEB's.

These participants were expected by the Ministry of Irrigation and Power to become the Managers and Engineers of additional Cooperatives.

### 3. Total Picture Today

The five Pilot Rural Electric Cooperatives have already proved that they have the following advantages:

- a. They are owned by the people that they serve.
- b. Rural Electric Cooperatives can supplement the efforts of the State Electricity Boards and will give them more time to concentrate on generation and transmission.
- c. Cooperatives operate as private licensees and inject private initiative into the management and operation of their organizations.
- d. Cooperatives have served as a yardstick for improving construction designs, improving management practices, reducing the cost of operations, staffing patterns and providing better consumer services.
- e. Cooperatives utilize an area coverage concept which makes electric service available to the ones that want it.
- f. Have proved that line losses are more than 10% and has caused the SEB's to strive to reduce their line losses.
- g. One Cooperative has reduced construction costs by obtaining voluntary labor (Shram Dan).
- h. The Cooperatives have raised the standards of living in their areas and have been the means of increasing the production of food.

Typical Problems

- a. The performance of three of the five Boards of Directors has not been outstanding.
- b. Boards have not delegated proper authority to four of the five managers.
- c. Competent managers and engineers are not available, except by deputation from SEBs and the State Cooperative Departments.
- d. Inadequate power supply due to a general scarcity of electric energy throughout India.
- e. The margin between the cost of energy and the retail rates is not enough to provide financial viability.
- f. Inability to obtain a dependable supply of construction materials.
- g. Low agricultural retail energy rates.
- h. Excessive line losses.
- i. The inability of the agriculturist to obtain loans for purchasing electric pumps and other appliances.

4. The Future Picture of Rural Electric Cooperatives

The Puri Committee Report on Rural Electric Cooperatives which was released in May 1973 provides an excellent evaluation of the performance of the five Pilot Projects. Likewise, the Evaluation Report on Five Pilot Rural Electric Cooperatives in India which was made by Mr. Gerald Diddle on June 23, 1971 encourages the continuation and expansion of Rural Electric Cooperatives.

The Puri Report states that the performance of the Pilot Projects compares favorably with the respective SEBs and that the operational procedures of Cooperatives are better tuned to the requirements of the consumers. Chapter III paragraph 3.12 "It may be

observed that, excepting in the cases of Mula Pravara and Kodinar, the performance of the other three cooperatives compares favorably with that of the respective SEB. The Advisory Committee on Rural Electric Cooperatives set up by REC, in its 4th meeting, also observed that the level of performance of the pilot rural electric cooperatives even though inadequate with reference to targets envisaged, was much better than the SEBs performance in respect of their schemes financed by REC. The special studies conducted by the Indian Institute of Management and others also bring out that, generally, the performance of the cooperatives - excepting that of Mula Pravara for special reasons - compares favorably with the performance of SEBs in the implementation of rural electrification schemes."

The Para Report recommends guidelines and standards for future Rural Electric Cooperatives.

The primary purpose of the five Pilot Projects was to test the feasibility of Rural Electric Cooperatives. The conclusions are that they are desirable for expanding rural electrification in India. The GOI plans, as we understand, to organize at least five Rural Electric Cooperatives during the next year and 100 during the 5th Plan, depending upon their ability to obtain the required capital.

The future success of Rural Electric Cooperatives depends, to a great extent, on obtaining adequate wholesale power supplies at reasonable rates, long-term loans at low interest rates, member services programs, job training and safety programs, obtaining competent personnel and qualified Boards of Directors.

## Part Two: Structural Evaluation

### I. PROJECT PURPOSES

To test the feasibility of Cooperatives for intensive rural electrification and introduce new techniques for operation and management of rural electric distribution systems.

### II. CONDITIONS EXPECTED AT END OF PROJECT

1. Adequate electric supply at high standards of service and reasonable rates throughout the areas served by the cooperative electric utilities which will increase agricultural production, stimulate local agro-industries, and generally improve the standard of living.

2. Local participation in the management of rural electric distribution.

3. Local services for financing, procurement, installation, repair and proper use of electrical appliances and equipment such as pump sets.

4. Standardized, economical practices for construction and operation of rural electric systems.

5. Management and engineering personnel trained and experienced in procedures for effective and economical rural distribution of electric supply.

### III. PERFORMANCE ANALYSIS

The photographs of the Project Progress Charts, annexure II, indicate that all pilot projects have grown.

#### 1. Kukeri

Growth has been constant and uniform, connected consumers increased from 5,588 to 8,603, quarterly energy sales from 809,291 to 1,465,545 units, revenue from energy sales, per quarter, from Rs.163,949.78 to Rs.334,533.03 and lines in service from 470 to 777 Kms.

2. Kodinar

The overall growth has been uniform but less than the scheme forecast, connected consumers increased from 3,594 to 6,258, quarterly energy sales from 899,127 to 1,845,220 units, quarterly revenue from energy sales from 203,721.77 to Rs.386,851.71 and lines in service from 220 to 454 Kms.

3. Lucknow

The connection of new consumers has been slow but energy sales and construction are only slightly below the projected targets. Connected consumers increased from 3708 to 5533, quarterly energy sales from 2,506,233 to 2,698,001 units, quarterly revenue from energy sales from Rs.535,483.41 to Rs.761,072.58 and lines in service from 504.70 to 1155 Kms.

4. Mula Pravara

Energy sales have increased but construction has not been according to schedule. Connected consumers increased from 13,896 to 16,897, quarterly energy sales from 2,977,702 to 10,075,167 units, quarterly revenue from energy sales from Rs.529,512.00 to Rs.1,960,959.74 and lines in service from 1830.62 to 2136 Kms.

5. Sircilla

Progress has been outstanding at this Cooperative. Connected consumers increased from 4,720 to 12,021, quarterly energy sales from 669,477 to 3,096,156 units, quarterly energy sales revenue from Rs.189,093.43 to Rs.468,964.82 and lines in service from 655.348 to 1940 Kms.

SUMMARY OF EVALUATION TABLE

<u>Project</u>	<u>Connected Consumers</u>			<u>Quarterly Energy Sales (kwh)</u>		<u>Quarterly Revenue</u>		<u>Lines in Service(kms)</u>		
	<u>Begin- ning</u>	<u>Pre- sent</u>	<u>In- crease</u>	<u>Beginning</u>	<u>Present</u>	<u>Energy Sales Beginning</u>	<u>Present</u>	<u>Begin- ning</u>	<u>Pre- sent</u>	<u>in- crease</u>
Hukeri	5,588	8,603	3,015	809,291	1,465,545	163,949.78	334,533.03	470	777	307
Kodinar	3,594	6,258	2,664	809,127	1,845,220	203,721.77	386,851.71	220	454	234
Lucknow	3,208	5,533	2,325	2,506,233	2,698,001	535,483.41	761,072.58	505	1,155	650
Mula Pravara	13,806	16,897	3,091	2,977,702	10,075,167	529,512.00	1,960,959.74	1,831	2,136	305
Sircilla	4,720	12,021	7,301	669,477	3,096,156	189,093.43	468,964.82	655	1,940	1,285
<b>TOTAL</b>	<b>30,916</b>	<b>49,312</b>	<b>18,396</b>	<b>7,771,830</b>	<b>19,180,089</b>	<b>1,621,760.39</b>	<b>3,912,381.88</b>	<b>3,681</b>	<b>6,462</b>	<b>2,781</b>

Part Three - Progress

IV. PROGRESS TOWARDS CONDITIONS EXPECTED AT END OF PROJECT

Creditable progress has been made in the development of Rural Electric Cooperatives in India. The achievement goals may have been overly ambitious considering the general problems that are encountered in this country. Most of the targets have not been fully attained. The Puri and Diddle reports are encouraging and predict a continued development of Rural Electric Cooperatives.

1. Electric Supply

It has not been possible for the Cooperatives to provide an adequate supply of electricity to its members due to the general drought in India which has practically stopped hydro-generation. "All State Electricity Boards have imposed power cuts on all cooperatives, ranging from 25% to 50%. This has caused undue hardships to some industries and agriculturists."

2. Rates

The Cooperatives have used the same retail rates as the SEBs. There has been a general increase in retail rates during the last four years. Two of the projects have obtained lower bulk power rates, whereas, the rates have been increased for two projects. The REC is demanding the State Electricity Boards to supply energy to the cooperatives at the same rates that they use to prove viability of their cluster schemes.

3. Service

The Cooperatives have improved the standards of service to their consumers. The Puri Report states that the Cooperatives provide better services to their consumers than the SEBs. The service areas of cooperatives center around one central headquarters from which all operations are controlled. Members more easily contact cooperative officials for service.

#### 4. Construction Standards

The NRECA technicians have introduced new tools and construction techniques which have improved the operation and construction of lines. The REC is publishing a Manual covering standard construction units and construction methods. The Cooperatives have introduced the use of compression tools for splicing conductors which has been adopted by SEBs.

#### 5. Agricultural Production

The extension of electric lines to serve thousands of irrigation pump sets has increased the production of food and has raised the economy and standards of living in the service areas. Most agriculturists are growing at least one extra crop per year by using electric pumps for irrigation.

#### 6. Agro-Industries

Numerous grain mills and processing plants have been electrified. Hand looms are being powered by electric motors. One textile plant has been located on the lines of the Siratilla Cooperative. The Lucknow Cooperative serves a cold storage plant, and a large industrial park area.

#### 7. Local Participation

Many members have helped to construct lines to serve their villages. One Cooperative has elected a Board of Directors. The members are demonstrating pride in saying, "This is our Cooperative." Member participation could be encouraged through news letters and member education.

#### 8. Financing Services

Only one Cooperative participates in financing the purchase of appliances. Banks are financing the purchase of appliances to those with high credit ratings. There is a general need for obtaining small loans to finance the cost of wiring homes.

### 9. Repair of Electrical Appliances

No Cooperative provides this service. Local servicing organizations provide fair service. A Cooperative appliance shop would provide an added service to its members and would serve to increase energy sales.

### 10. Training Personnel

Progress has been made in this area. The training of deputed personnel does not assure that future employees will be qualified and adequately trained. Valuable benefits were received by the training of participants in the U.S. The REC should develop a central training agency for cooperative employees. One State Electricity Board has offered to train Cooperative personnel.

### 11. Staffing Patterns

There has been a tendency to over-staff. Cooperative has over 400 employees. This practice threatens the viability of the Project. The REC has made a study of the staffing requirements of a Cooperative and has recommended a system to determine the actual number of employees required to operate an electric cooperative.

### 12. Work Order System

A complete work order system is in use by the Project. This provides accurate records of construction and supports plant records. There is need for improving the system by promptly making completion reports and capitalizing work orders.

### 13. REC Role

The Rural Electrification Corporation has been an important asset to this program. It has supplied loans to finance the purchases of the existing lines and construction of new lines. It has established a

Cooperative Cell which is providing accounting and management training through Seminars and personal instructions. The REC engineering staff has devoted much work to improving construction and material standards. The Cooperative Cell must assume a major role in the organization of future Cooperatives.

The REC has sponsored Job Training and Accounting Seminars with the assistance of NRECA Specialists. One successful Management Seminar was recently conducted at Belgaur. The REC is sponsoring a Safety Contest and plans to make annual rewards to the Cooperative that has the best safety record.

#### Part Four: Follow up Action

Where should the program go from here?

Many factors must be considered in mapping the future of Rural Electrification in India. Many "road-blocks" must be removed before proceeding on an accelerated expansion program. The Puri Report suggests solutions to part of the problems which are:

1. Obtain lower bulk power costs.
2. Obtain at least 25% of the system cost by share capital and other contributions.
3. Develop practical retail power rates.
4. Provide training to personnel.
5. Require the SEBs to purchase share capital in the Cooperatives.
6. Obtain Government subsidies for Cooperatives.
7. Obtain legislation to support and protect Cooperatives. USAID

agree in general with the Puri Report but believe that only a few Cooperatives should be organized until the above major problems

have been solved. It would be tragic for Cooperatives to fail. The REC needs the continued assistance of foreign Rural Electrification Specialists if an ambitious Rural Electrification Program is developed.

Further Guide-Lines

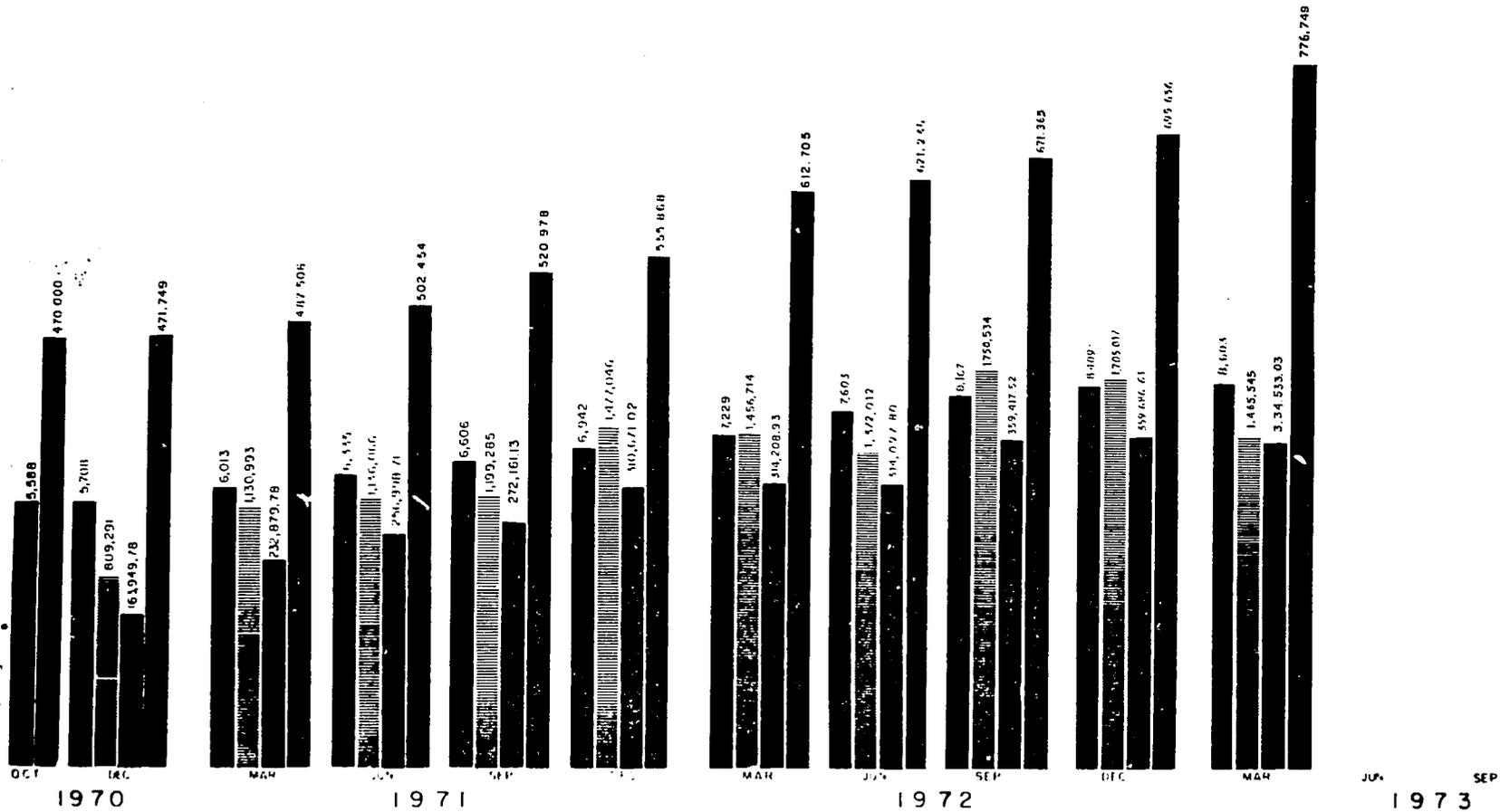
1. Service Area - The service area should cover about 800 sq. kms. and should, preferably, be in one Taluka.
2. A competent and dedicated management and engineering staff must be assured. REC should prepare standard rules for their selection and provide training for key personnel.
3. Must obtain competent and dedicated Board Members.
4. Conditions of Supply - The REC should prepare standard rules and regulations for the operation of electric cooperatives which includes accounting, construction, member services, system maintenance, etc. REC should enforce such rules by withholding loan funds until they are complied with. Rural Electric Cooperatives offer an opportunity to improve rural India. A coordinated program will provide the only way of success.

TECHNICIANS AND CONSULTANTS ASSIGNED  
 UNDER  
 PROJECT 386-11-220-342 - RURAL ELECTRIC COOPERATIVE  
 DEVELOPMENT

Name	Position Title	Location	Date of Arrival	Date of Dep.
Lyle M. Robinson	Rural Elec. Coop. Mgt. Spec.	Lucknow	9/22/69	8/20/71
Jay D. Lasater	" " "	"	10/20/71	6/30/73 (duty post shifted from Ahmedabad to Lucknow)
John L. Taylor	" "	Bangalore	9/22/69	9/23/71
Louie E. Sansing	" "	Belgaum	11/22/71	6/30/73
Jay D. Lasater	" "	Ahmedabad	9/22/69	9/22/71
George G. Berlin	" "	Poona	9/22/69	11/5/71
Jesse R. Chambless	" "	Hyderabad	10/4/69	10/4/71
John L. Taylor	" "	Hyderabad	10/28/71	6/30/73
G. F. Diddle	Evaluation Consultant	New Delhi	3/28/71	5/13/71 (duty post shifted from Bangalore to Hyderabad)

# The HUKERI TALUKA CO-OP. RURAL ELECTRICITY SOCIETY Ltd. [MYSORE]

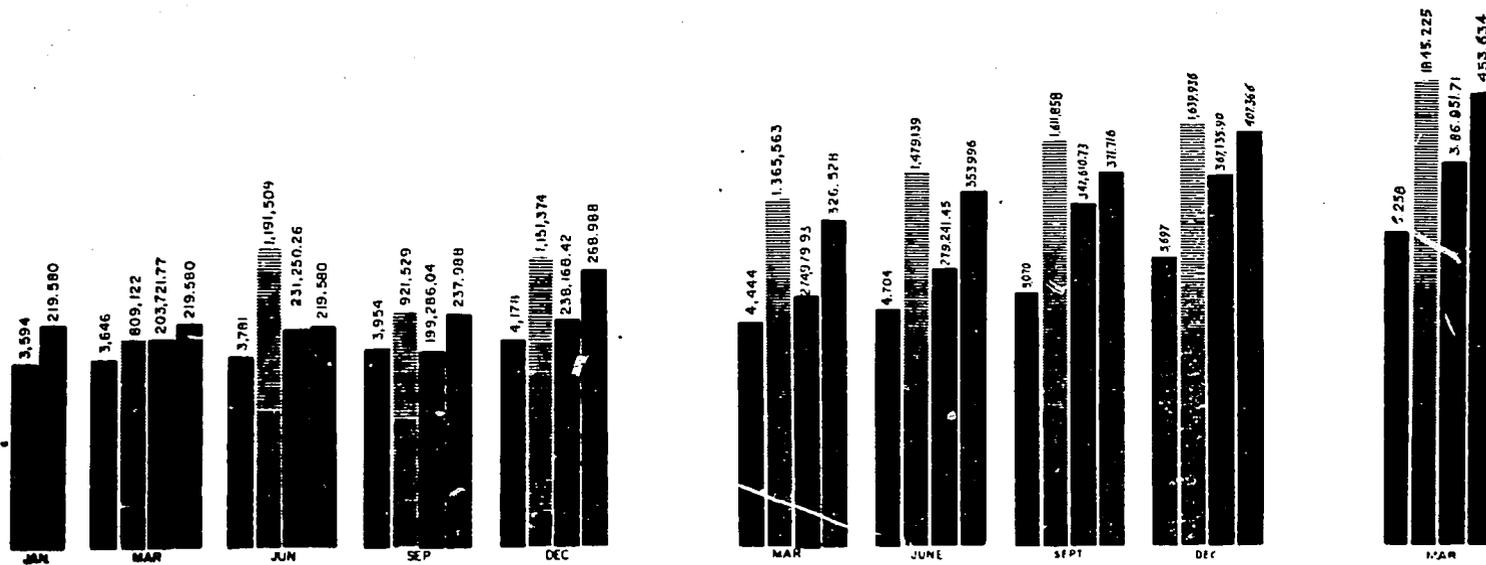
CONNECTIONS ———— 1" = 1000  
 KWH SOLD ———— 1" = 100,000  
 REVENUE Rs. ———— 1" = 100,000  
 LINES ENERGISED (KMS.) ———— 1" = 100



# The KODINAR RURAL ELECTRICITY COOPERATIVE SOCIETY Ltd. KODINAR

(GUJARAT)

CONNECTIONS \_\_\_\_\_ 1" = 1,000  
 KWH SOLD \_\_\_\_\_ 1" = 100,000  
 REVENUE Rs \_\_\_\_\_ 2" = 100,000  
 LINES ENERGISED (KMS) \_\_\_\_\_ 2" = 100

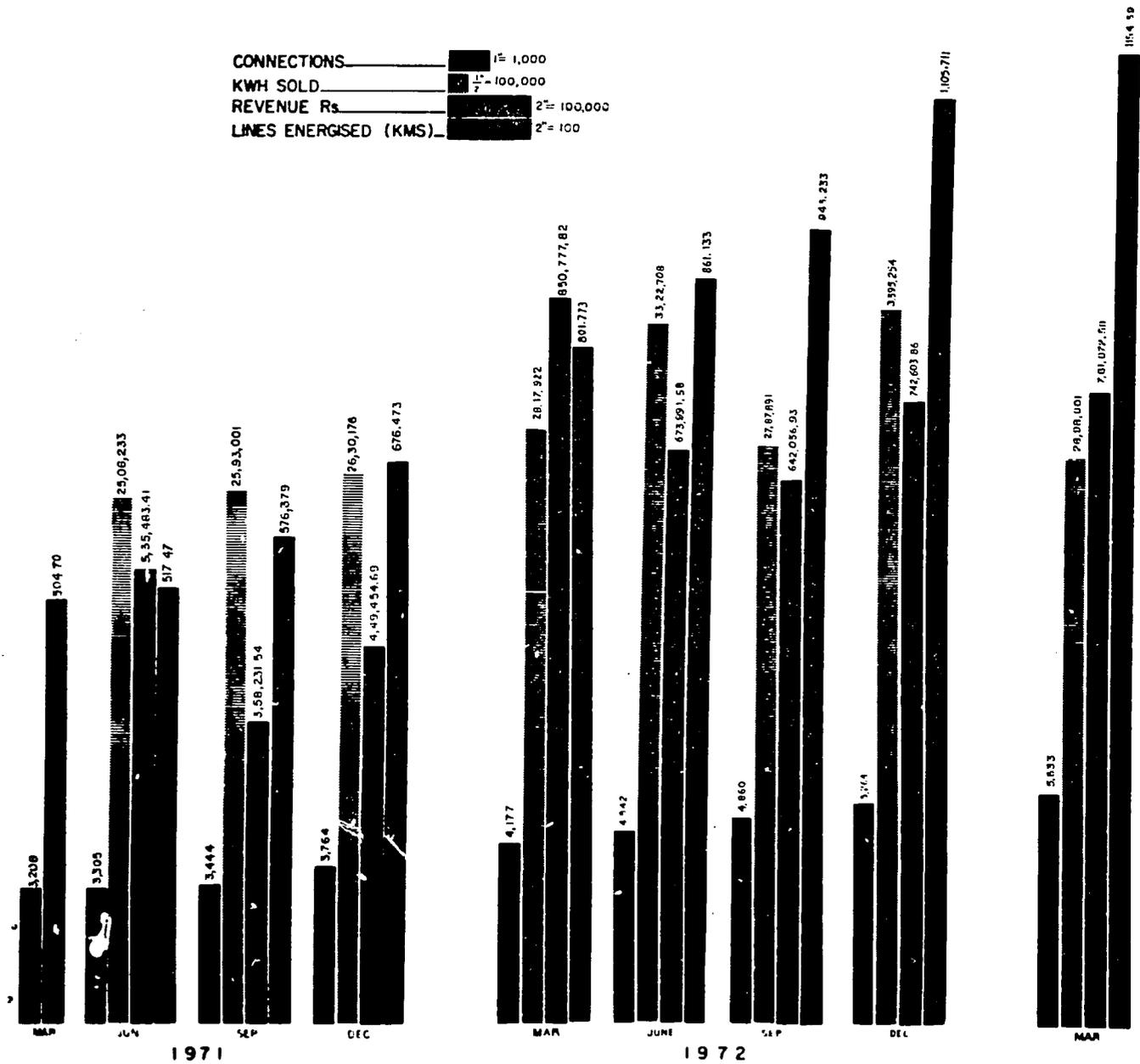


1972

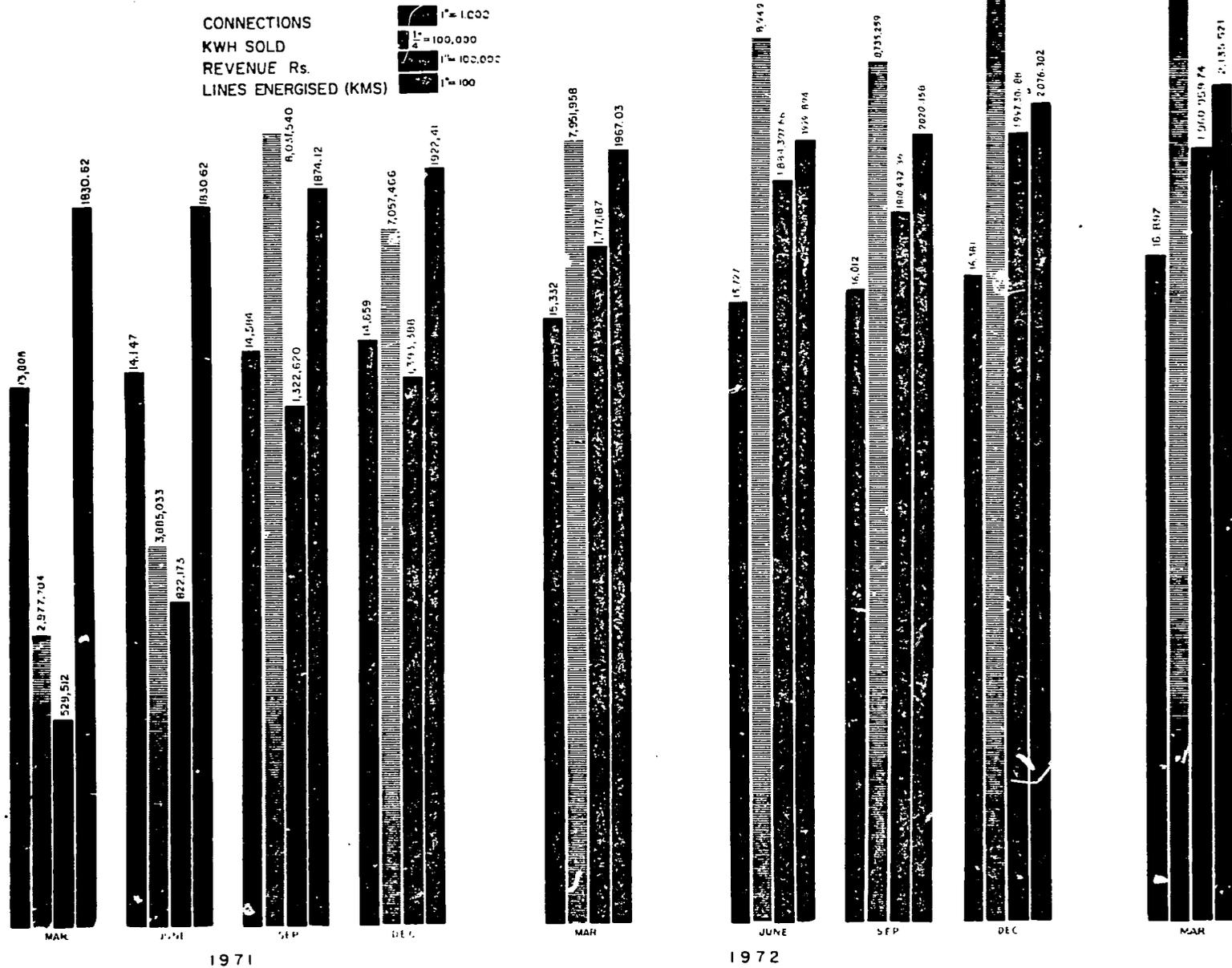
1973

# The COOPERATIVE ELECTRIC SUPPLY SOCIETY Ltd., LUCKNOW.

CONNECTIONS  1" = 1,000  
 KWH SOLD  1" = 100,000  
 REVENUE Rs  2" = 100,000  
 LINES ENERGISED (KMS)  2" = 100



# MULA PRAVARA ELECTRIC COOPERATIVE SOCIETY LTD. RAHURI Dist. Ahmednagar



# The CO-OP ELECTRIC SUPPLY SOCIETY LTD. SIRSILLA

CONNECTIONS  1"=1,000  
 KWH SOLD  1"=100,000  
 REVENUE Rs.  2"=100,000  
 LINES ENERGISED (KMS)  1"=100

