COMMITTEE ON RURAL ELECTRIC COOPERATIVES

REPORT

RURAL ELECTRIFICATION CORPORATION

NEW DELHI

MAY, 1973

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CHAPTER I

INTRODUCTORY

Constitution of the Committee

In terms of its charter, one of the main objectives of the Rural Electrification Corporation is 'to promote and finance rural electricity cooperatives in the country'. So far, five pilot rural electric cooperatives have been financed by the Corporation which has also constituted an Advisory Committee on Pilot Rural Electric Cooperative Projects. This Committee suggested that for considering further expansion of this programme of rural electrification through cooperatives, the Corporation might appoint a Committee to examine working of the existing cooperatives. The Board of Directors of the Corporation in their meeting held on the 29th December, 1971, accepted the suggestion of the Advisory Committee. In pursuance of the above decision, the Corporation appointed a Committee on the 15th February, 1972, with the following members :

1.	Shri S. S. Puri, Joint Secretary (Agriculture & Irrigation) Planning Commission, and Member of the Board of Directors of REC.	Chairman
2.	Shri N. Chaturvedi. Chairman, Rajasthan Cooperative Central Land Development Bank, and Member of the Board of Directors of REC.	Member
3.	Shri C. Laxmipathi, Retired Chief Engineer, Andhra Pradesh State Electricity Board, and Member of the Board of Directors of REC.	Member
4.	*Shri A. F. Couto, Director, Ministry of Irrigation and Power, and Member of the Board of Directors of REC.	Member

*Consequent on Shri A.F. Couto's relinquishing charge in the Ministry of Irrigation and Power, Shri P.K. Ramanujam. Director in that Ministry, was nominated as member of the Committee.

The Committee was also authorised to co-opt one additional member. Accordingly, the Committee, in its second meeting held on the 8th June 1972, co-opted Shri N.S. Mathur, Chief (COPT), REC, as its member. Shri Sundararajulu, Special Officer (Coop), REC, was appointed as Secretary of the Committee.

Terms of Reference

1.2. The Committee was required to examine all aspects of the formulation, organisation and working of the five pilot rural electric cooperatives financed by REC with a view to evaluating their performance, problems and promise and, in the light of such evaluation—

(i) make interim recommendations on such items as may require urgent consideration; and

(ii) suggest guidelines for the future in regard to the existing cooperatives as well as those which may hereafter be promoted with assistance from the Rural Electrification Corporation.

1.3 A copy of the Corporation's Memo. No. 2/3(10)/71-REC, dated the 15th February, 1972 appointing the Committee, is at Annexure I. A copy of the Corporation's Memo. No. 2/3(10)/71-REC dated 9 8.72 nominating Shri P.K. Ramanujam, Director in the Ministry of Irrigation and Power, as member of the Committee *vice* Shri A.F. Couto, is at Annexure II.

Meetings

1.4 The Committee held seven meetings including the one to sign the Report. In response to our request, S/Shri M.M.K. Wali, Managing Director, REC, P.A. Raman, Techical Director, REC, V.S. Bhir. FA & CAO participated in the discussions at some of our meetings. We met Shri Baliga, Chief (Power), Planning Commission, and discussed with him the progress of the pilot co-operatives and also the possible programme of rural electric co-operatives in the Fifth Plan. We had detailed and useful discussion with Shri B. Venkatappiah, Chairman, REC. We had also a meeting with the representatives of USAID/NRECA.

Questionnaires

1.5 The Committee issued one set of questionnaires to the pilot rural electric cooperatives and another to the SEBs, State Governments and the Registrars of Cooperative Societies of the States where these cooperatives have been established. Copies of the questionnaire issued are at Annexures III & IV. A list of persons from whom replies have been received is at Annexure V.

Field Visits

1.6 The Committee visited all the pilot rural electric cooperatives excepting the one at Kodinar which was visited by one member and the Secretary of the Committée. During its visits to the societies, the Committee held detailed discussions with the Chairman and other members of the Board of Directors of the cooperatives, the local representatives of SEBs and the Cooperation and the Industries Departments of the State Government, and the Land Development Bank. Besides, the Committee held discussions in respect of all five cooperatives at the respective State headquarters with the representatives of the State Governments, Chairmen or other representatives of the SEBs, Registrar of Cooperative Societies, representatives of the State Industries Department and Ground Water Organisation and also of the State land development banks. Although no rural electric cooperative has been established in Punjab, the Committee had discussions at Patiala with the Chairman and other members of the Punjab SEB and the Registrar of Cooperative Societies, on the broad approach to rural electric cooperatives. Shri N.S. Mathur, Chief (COPT), REC and member of the Committee visited some of the electric cooperatives in Gujarat organised in 1940s. Experts of NRECA, stationed at different places to guide the pilot rural electric cooperatives, associated themselves with the Committee's visits and discussions.

Evaluation Studies

1.7 To help us assess the performance of the pilot rural electric cooperatives, REC commissioned the Indian Institute of Management, Ahmedabad, the Vaikunth Mehta National Institute of Cooperative Management, Poona and the PACE Division of REC to undertake a critical study of these societies. The Indian Institute of Management was assigned to study load and revenue

growth and consumer response in the Kodinar Rural Electric Co-operative Society in Gujarat and in the Hukeri Rural Electric Cooperative Society in Mysore. The objective of this study was to compare the performance of the cooperatives with that of the respective Electricity Board in respect of a selected rural electrification scheme implemented by the Board with financial assistance from REC. Such comparative study of load and revenue growth and consumer response constituted a common term of reference to the other two agencies also. Besides, the Vaikunth Mehta National Institute of Cooperative Management studied the problems of internal management of the Mula Pravara Rural Electric Cooperative Society in Maharashtra, and the PACE Division of REC examined the operational and financial management of the Lucknow Rural Electric Cooperative in U.P. and also of the Sircilla Rural Electric Cooperative in Andhra Pradesh. The detailed terms of reference given to these organisations are at Annexure VI. We have received all the study reports which shed light on the achievements and areas of weakness of the cooperatives. A summary of the main findings and conclusions of these studies is given at Annexures VII to X.

Scope of the Report

1.8 We have, in this Report, attempted a broad balance-sheet of the performance of the five pilot rural electric cooperatives, examined their problem areas requiring greater attention, and have also suggested the lines on which the present pilot experiment may be enlarged to assess more realistically the role of cooperatives in the overall scheme of rural electrification in the country before launching on a programme of substantial expansion of rural electrification through cooperatives. We have not submitted any formal interim report. However, at the conclusion of our visits to each society and discussions at State headquarters, we had issued proceedings of the Committee which, *inter-alia*, focussed attention on the major problems of the respective societies requiring immediate attention. We are glad to note that, on the basis of the observations and suggestions incorporated in these proceedings, the Corporation had initiated action to improve the working of

the individual societies. Copies of these proceedings are at Annexures XVII—XXI.

Pattern of the Report

1.9 The ensuing chapters are patterned as follows. A historical background of the pilot rural electric cooperatives is outlined in Chapter II. A detailed analysis of the performance of the existing cooperatives is attempted in Chapter III. The approach to rural electric cooperatives to be organised is discussed in Chapter IV. Our conclusions and suggestions are summarised in Chapter V. Various Annexures referred to in this Report have been compiled into a separate volume.

Acknowledgements

1.10 We express our grateful thanks to the Chairman, REC, the Managing Director, the Technical Director and other senior officers of REC, representatves of USAID/NRECA, Shri Baliga, Chief (Power) Planning Commission, State Governments, SEBs, Registrars of Cooperative Societies, the Indian Institute of Management, Ahmedabad, the Vaikunth Mehta National Institute of Cooperative Management, Poona, the PACE Division of REC, all the rural electric cooperatives, other institutions and individuals who, as mentioned in the preceding paragraphs, have sent us replies in response to our questionnaires, conducted case studies, furnished information, or took pains to give us, at our request, the benefit of their experience, views and suggestions on various matters pertaining to our field of enquiry. Our thanks are also due to Shri B.P. Sastry, Project Officer, REC and to Shri M.D. Joshi, formerly Joint Director (Coop), REC and Shri B.K. Varma who succeeded him, for their valuable assistance and collaboration. We would like to make a special mention of Shri G. Sanjeeva Rao, Assistant Director, REC, S/Shri S.K. Kapoor, and V.P. Sharma, Economic Assistants, Shri S.K. Bhatia, Stenographer and Shri P.L. Batra, Assistant of the Cooperative Division of REC, who did a great deal to lighten the burden of the Committee's labour by working long hours with devotion and

efficiency. We also owe thanks to Shri C.R. Ekambaram, Information and Public Relations Officer, REC and his staff for their assistance in getting the Report printed in a short time. Last but not the least, we must place on record our deep sense of appreciation of the excellent contribution made by Shri K. Sundararajulu as Secretary of the Committee. But for the hard work done by him to collate, to analyse and synthesise the material received from different sources, it would not have been possible for us to present the report within a reasonable time span.

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CHAPTER II

RURAL ELECTRIC CO-OPERATIVES-- HISTORICAL BACKGROUND

I

Rural Electric Cooperatives in USA

Genesis of Rural Electric Cooperatives in USA

The experience of American Cooperatives was largely drawn upon in organising the five pilot rural electric cooperatives in India. Hence it would be pertinent to take note of the genesis, growth and impact of rural electric cooperatives in USA. We propose to do so in the following paragraphs.

2.2 As late as mid-1930s, nine out of ten rural homes in America were without electric service. The rate charged by the power companies for rural service was frequently 10 or 12 cents per KWH, and, in some cases, the companies charged as much as 25 cents and even 40 cents per KWH. It is reported that, for a farm, the rates were charged according to its size which included the "number of milch cows which the farm is capable of carrying." On top of this, farmers were required to pay for the lines, and the charges ranged from 2000 to 3000 and even 5000 dollars per mile. All these rendered electricity practically inaccessible to farmers for production purposes as the price of wheat then was only 80 cents per bushel.

2.3 The indifference of the power companies to the needs of the farmers is illustrated by the following declaration made by a group of utility company executives in 1935 :

> "There are very few farms requiring electricity for major farm operations that are not now served."*

*"Rural Electric Facts" published in 1970 by the National Rural Electric Cooperative Association.

2.4 The power companies maintained that "the national level of farm must be raised to a point at which we can profitably afford to serve agriculture."* But the farmers and their organisations urged : "the cost of electrical service must be lowered to a point where farmers can pay for it out of their present income and thus help increase those incomes."*

Achievement of Cooperatives

2.5 Now, over 90% of the farms in America are electrified. This phenomenal extension of electricity to rural areas at progressively cheaper rates in a period of rising prices of farm products, has helped to transform American agriculture and modernise the country-side. This massive rural electrification has "upgraded farm production and made rural living safer, healthier and more convenient. With rural areas electrified, people and industries can locate in the country-side as an alternative to crowded cities. Rural electrification has broadened the tax base in rural counties and created an entirely new market for electric appliances and equipment estimated at 2½ billion dollars annually."**

2.6 It is the cooperatives that have 'lighted up' rural America with the help of the Federal Government. "Nearly 1000 rural electric cooperatives—all of them member-owned private enterprises, borrowed federal funds under the Rural Electrification Act to provide electric service. Now they operate 44% of the electric distribution lines in the U.S., to serve 8% of the nation's consumers in 25078 out of 30072 counties in the continental United States. But they generated only 1% of the electric power supply."** How this has happened, is briefly described in the following paragraphs.

Role of REA

2.7 It came to be increasingly realised in America that rural electrification was not possible without active government assistance. Mr. Harry Slattery, a former Administrator of REA records :

"Norway, Sweden, Denmark, France, Germany, The Netherlands, Australia and New Zealand had far out-distanced the

*"Rural America Lights up" by Harry Slattery.
**"Rural Electric Facts".

United States in rural electrification. The number of farms having central station service in these countries ranged from 50 to 90 per cent as against our 10 per cent.

In every case, investigation by American experts disclosed that the chief reason for this remarkable progress had been Central Government aid, or sponsorship in various ways. Such aid was given to voluntary cooperatives, public plants, and private agencies. In other words, private enterprise abroad had proved unsuitable to meet the needs of agriculture, as it had in the United States, and Governments had been forced to take the initiative in the interest of the common good."*

2.8 The rural electrification programme in America was taken up, to begin with, as an essential feature of 1935 relief programme, popularly known as New Deal. President Roosevelt's Executive Order dated the 11th May, 1935, setting up the Rural Electrification Administration anticipated that outright grants of Federal money would be used to relieve some of the unemployment which prevailed in 1935. Initially, the new Agency found itself unable to accomplish much rural electrification for the reason that construction of lines called for skilled labour which was available with the power companies and they evinced little interest in the rural electrification programme.

2.9 The Rural Electrification Act passed in 1936 established the Rural Electrification Administration as a lending Agency on a continuing programme for 10 years. Preference was to be given to non-profitable organisations such as cooperatives, municipalities etc. "The 1936 Act authorised 100% financing of new electric systems, upon certification by the REA administrator that in his judgment the security for each loan he approved was reasonably adequate and that repayment of the loan could be expected within the time agreed upon." The 1936 Act specified 25 years as the maximum loan repayment period, with the rate of interest determined by the average rate paid by the Government on its own long term securities.

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*"Rural America Lights up" by Harry Slattery.

2.10 In 1944. the Rural Electrification Act was amended. The main features of this amendment were :

(i) REA was to continue indefinitely.

(ii) Interest rate on outstanding and all new REA loans was reduced to 2%.

(iii) The amortisation period of loans was extended from 25 to 35 years.

2.11 At the end of REA's first year, it is reported that only 7 power companies had borrowed funds for rural electrification. It was at this stage, in 1935 and 1936, that farmers began to organise themselves into mutual aid cooperatives for obtaining electricity. This campaign for cooperatives has been described as one of the most remarkable organising campaigns in the American history. As the companies showed little interest, REA had to turn its attention to rural electric cooperatives. The emergence of co-operatives as the predominant borrowers, shaped REA also into something more than just a lending institution REA itself emerged as a developmental financing institution employing lawyers, engineers and other specialists to help the nascent cooperatives. REA's assistance has extended to all facets of activities of a rural electric cooperative. The important developmental activities of REA include :

(i) The technology of the electric power industry which was designed for cities, proved to be too costly and cumbersome for thinly populated rural areas, REA engineers, in coordination with cooperatives and manufacturers and suppliers, had developed entirely new designs, standards, materials and procedures for engineering and construction in rural electrification. The result of this was that the cost per mile was brought down from about 1500 dollars to 825 dollars by 1939 and further to 720 dollars in 1940.

(ii) It devised for its borrowers a uniform system of accounts and also developed a correspondence course to train rural electrification accountants.

(iii) It sent teams of trained specialists in wiring, irrigation and home economics into the rural counties to help people who had no experience with electricity.

(iv) It arranged group wiring plans and package purchasing which aided consumers.

(v) It helped cooperatives in management and member relations. It provided training seminars in many phases of system management to encourage boards of directors, managers, and key personnel to assume more and more responsibility for their own operations.

Reorganisation of REA staff in 1952 brought loan analysts, engineers, and accontants together in geographical area offices so that borrowers would have a single point of contact. It is reported that, in some instances, REA helped the prospective cooperative organise and incorporate, where there was lack of experience with cooperatives or where local legal obstacles had to be overcome. Further, powers conferred on REA permitted it "to temporarily suspend the independent management of a defaulting cooperative and replace the organisation, and in other respects, manage the cooperative until operations achieve a satisfactory status"

2.12 Incidentally, it is interesting to note that the association of Government with cooperatives was looked upon with suspicion by the orthodox cooperators in America.

Marquis Childs observes :

> "One of the dedicated leaders of the movement in America was James Warbasse, long head of the Cooperatives League of the U S.A. Absorbed in the ideology of cooperation and somewhat removed from its practical aspects, Warbasse's view was that of the theorist who feels that any variation from the orthodox concept is bound to be harmful. He felt strongly that the state and the cooperative movement had interests so opposed as to make any harmonious relationship impossible..."*

2.13 Clyde T. Ellis, the first General Manager of the National Rural Electric Cooperative Association, has recorded :—

> "It didn't take me long to realize some co-op leaders in our own and other countries viewed the phenomenon of the rural electric co-ops with reservation. They felt that the participation of government in creating our cooperatives and in the financing of them made them suspection philosophical

*"The Farmer Takes a Hand" by Marquis Childs.

grounds. There was a period, in fact, when some of the leaders of the Cooperative League of the U.S.A., a national federation, made it plain that they would rather the upstart rural electrics were not affiliated with the league or represented on its board of directors."*

2.14 The three major factors that underline the success of the rural electrification programme in America are : cooperatives, low rate of interest, and area coverage concept which has redefined rural electrification. The area caverage concept is built into "REA pattern" of successful rural electrification. To a cooperative, area coverage means :

(a) it should build a backbone electric distribution system adequate for providing service to everyone in the area who might want service ;

(b) determine feasibility by whether or not total revenues were sufficient to meet all costs and repay the REA loan—computed on the cooperative's entire system rather than on a particular line extension ; and

(c) in general, do not require individual consumers to pay construction costs of individual line extension.

Working of a typical Cooperative

2.15 The typical rural electric cooperative, it is reported, serves about 6300 consumers. It borrows about 5.1 million dollars from REA and its annual sale of energy is about 55 million KWHs. The average annual operating revenue for 1968 was 1.09 million dollars, and the average annual operating expenses was 0.927 million dollars. Margins from the operations are credited to the consumers as their paid in capital in the cooperative and are used by the cooperatives to meet part of its capital needs. The number of employees an average cooperatives has, is reported to be 35.

*"Giant Step" by Clyde T. Ellis.

Size of Cooperatives

2.16 Regarding the size of cooperatives in America, it has been observed "Relatively few cooperative systems qualified for the ideal condition which would assure their success. Many are too big to maintain the kind of face-to-face town-meeting kind of democracy expected in member-owned cooperatives. Others are too small to operate economically in today's business world." The largest area covered by a cooperative is reported to be 12800 sq. miles and the smallest cooperative served 42 consumers with 14 miles of lines.

Bulk purchase of power

2.17 A cooperative buys its wholesale supply of power from power companies, from Government agencies, or from a cooperative federation of which it is a member. The REA Act empowers the Administrator to give loans "for the purpose of financing construction and operation of generating plants, electric transmission and distribution lines or system for furnishing of electric energy to persons in rural areas." There are 43 G & T (Generation and Transmission) cooperatives, which are owned and controlled by groups of rural electric cooperatives. Many of them do not operate generating plants but only provide transmission facilities or purchase power for member cooperatives at rates lower than what they could individually negotiate with the power companies. Power supply cooperatives operate about 80 generating plants and about 22% of the requirements of rural electric cooperatives are met by the cooperative generating plants, about 32% from power companies, 39% from federal agencies and the rest from others. The cost of power has been brought down from 9 mills (nineteenths of a cent) per KWH in 1948 to 6.8 mills in 1968. This reduction, it has been reported, is largely due to REA's authority to make loans for generating plants and transmission lines. A number of cases have been reported wherein mere consideration by cooperatives of obtaining a loan from REA for generation had brought down power company prices.

NRECA

2.18 The success recorded by the rural electric cooperatives evoked serious opposition from the power companies. "The utility's lobby

screamed to Congress. It urged that legislation be passed forbidding REA to make any loan for generation and transmission of power." Some of the power companies actually interfered with the working of the rural electric cooperatives and carried on virulent propaganda against the cooperatives. Clyde Ellis records that "many companies also engaged in other deplorable tactics in their desperate efforts to head off the development of cooperatives or rural power districts..... They claimed co-op and power district poles and wires were inferior, and the kilowatts weren't as "hot"." "In at least two cases power companies set their poles in the co-op's holes – in one State at night, in another on a Sunday." A need arose, therefore, for a National Association to speak for cooperatives and protect their interests in Washington. This led to the formation of the National Rural Electric Cooperative Association, which serves as the national service federation and public relations and legislative defender of the rural electric cooperatives. The NRECA works closely with the REA, but receives no REA funds. REA and NRECA play a very active role in personnel recruitment, staff training, system engineering and many other services which are key factors in the rapid expansion and efficiency of the electric system. NRECA has also entered into in agreement with USAID for providing technical assistance for rural electric programmes in the developing countries.

Repayment performance of cooperatives

2.19 A major strength of the cooperative rural electrification programme in America is its "almost unbelievable repayment record." By the end of the fiscal year, 1969, the repayment of principal as scheduled, amounted to 1786.33 million dollars. In addition, borrowers had repaid 347.03 million dollars in advance of due dates. Since the loan programme began in 1935, Federal Government had to close only two small loans out of a total of 1100. It has therefore been called "the greatest repayment record in the history of banking, private or public".

II

Early Experiments in India

Experiment in the former Bombay State

2.20 The experiment of electric cooperatives in India could be

traced to earlier than the First Plan period. The then Government of Bombay formulated a scheme for promoting electricity cooperatives which, in addition to providing power for lighting purposes, could also provide electricty as motive power for irrigation. The State Government made in the Second Plan a provision of Rs. 14 lakhs as loan and Rs. 2.4 lakhs as subsidy for helping these cooperatives. Financial assistance to electricty cooperatives was given on the following basis :

(a)	Share capital participation	— ⅓rd of the capital cost.
(b)	Non-recurring subsidy towards capital cost	— To the extent of 25% of the additional capital cost entailed in the supply of electricity for irrigation purposes.

As a result of this assistance, 18 electricity cooperatives were organised—12 in Maharashtra area and 6 in Gujarat area.

Vyara society in Gujarat

2.21 One of the members of our Committee visited two of the societies in Gujarat, namely, the Vyara Kanpura Electric Cooperative Society Ltd., in Surat district and Shree Sardar Kheti Sahayak Sahakari Vidyut Mandal Ltd., Bardoli. The Vyara society was organised as a consumer cooperative in 1940 and obtained a licence for a period of 30 years. From 1940—47, the society was practically dormant. It was only in 1947 that the society acquired generating sets and began constructing lines and distributing electricity in its area. The society started with a share capital of about Rs. 2 lakhs and borrowed another 2 lakhs from the public. It has since repaid its debts.

2.22 From 1947 to 1964, the society was generating and distributing eleetricity. Since 1964, the society has been obtaining grid power. It has not, however, disposed of its generating sets of 240 KWs. These generating sets are used as stand-by whenever there is load shedding by the Gujarat Electricity Board. Because of its efficient service, the consumers in the area are satisfied with the society even though the rates charged by the society are higher

than those prevailing in the GEB area. The comparative rates are as follows :—

(*Paise per unit*)

	Society	*GEB*
Domestic	40	31
Commercial	20	18
Industrial LT	20	18

2.23 The society distributes on an average of about 1 lakh units per month. The total line loss in the society is of the order of 20%. According to the information furnished by the society, the cost per unit sold is 26 paise, whereas the average selling rate is 29 paise per unit. In other words, the society has a margin of 3 paise per unit. The annual distribution is about 10 lakh units and the profit of the society is about Rs. 30,000 per year. A highlight of the functioning of this society is that its members have agreed to surrender the dividend and permit the society to contribute to educational institutions in the area. The society has contributed about Rs. 1.04 lakhs to the educational institutions in its area.

Bardoli society

2.24 Shree Sardar Kheti Sahayak Sahakari Vidyut Mandal Ltd., Bardoli was registered in April, 1948. This society was generating and distributing electricity from 1951—56 and has since disposed of its generating sets. To begin with, the society was operating within a radius of 8 miles of Bardoli town. When it took grid power, the society confined its distribution to the Bardoli town. Agricultural load in this society is only 8% of the total connected load. The society distributes, on an average, about 1.15 lakh units per month. The line loss in the society is of the order of 20%.

2.25 The society tried to increase its tariff to consumers to a level higher than that obtaining in the electricity board area. Its tariff for light and fan was raised from 31 paise to 40 paise from 1.1.1970. The consumers went to the court against this hike in tariff and the society had to reduce its rates to 31 paise. The management of the society feel that the society cannot work economically with the present tariff structure.

2.26 The early experiment of electric cooperatives like the two cooperatives we referred to above, has been more urban based. These cater mainly to small towns. Five such cooperatives are now functioning in Gujarat and three in Maharashtra.

III

Rural Electrification in the Agricultural Strategy

2.27 The concept of rural electrification has undergone a radical change in recent years. The main objective of rural electrification programme in India, as late as in 1965, was lighting of villages and rural homes. The severe strain on the Indian economy during 1965–67 brought about by two consecutive seasons of widespread crop failure leading to steep decline in food production, focussed the attention of the nation on the urgent need to raise food production. Fortunately, it was around this period that the new agricultural strategy was evolved. This new strategy envisaging introduction of high-yielding variety of seeds and larger application of fertilisers, called for a massive exploitation of groundwater potential. In this context, rural electrification assumed a new significance for servicing the agricultural production programmes. Since 1966-67, the programme of rural electrification, with vastly increased outlays, has been geared to agricultural production. The importance attached to this programme is illustrated by the outlays in the various plans for this programme.

		(*Rs. in crores*)
First Five Year Plan.	8.3	(actuals)
Second Five Year Plan.	75.0	(actuals)
Third Five Year Plan.	153.3	(actuals)
Three Annual Plans.	238.00	
Total Plan outlays from 1st Plan upto the end of 1968-69.	474.6	
Provision in the Fourth Plan		520.00
Anticipated Outlay in the Fourth Plan		840.00

In other words, the total outlay during the Fourth Plan on rural electrification will be twice the outlay during the entire preceding 18 years.

2.28 Large investment in rural electrification in very recent years has yielded substantial results as is evident from the following table :

	No. of villages electrified	No. of pump sets energised (lakhs)
1. As on 31-3-1966	44,982	5.13
2. Added during		
(a) 1966-67	9,394	1.36
(b) 1967-68	8,599	2.00
(c) 1968-69	11,344	2.39
(d) 1969-70	15,635	2 66
(e) 1970-71	17,421	2.75
(f) 1971-72	14,719	2.61
3. Cumulative position as on 31-3-72	1,22.094	18.90

By the end of the Fourth Plan, about 1.48 lakh villages (26.1% of the total number of villages) are expected to be electrified and about 2.42 million pumpsets/tubewells energised.

IV

Pilot Rural Electric Cooperatives

Feasibility study by experts

2.29 The five pilot rural electric cooperatives were conceived as a part of the wider programme of rural electrification for supporting agricultural production. The Conference of Chairmen of State Electricity Boards, held in November 1965, recommended :

> "It was agreed that one rural electricity cooperative in the area of each State Electricity Board should be formed as a pilot project, after discussions are held with the experts from USAID on the subject. If the experiment is found to be successful, the scheme would be extended further. It was also agreed that the rural electricity cooperatives, when those are constituted, should be closely linked with the rural industrial processing cooperatives. The programme of rural

electricity cooperatives would be complementary to the activities of the State Electricity Boards in the field of rural electrification."

Subsequently, the Union Ministry of Irrigation and Power sponsored an investigation to be carried out by US experts from NRECA (National Rural Electric Cooperative Association) regarding the establishment of rural electric cooperatives.

2.30 The investigation by the NRECA experts was divided into three phases. Phase I related to identification of areas suitable for location of pilot rural electric cooperatives. On the basis of Phase I study, the Government of India accepted the location of five pilot rural electric cooperatives in the States of Andhra Pradesh (Karimnagar District, Sircilla taluk), Gujarat (Amreli District, Kodinar taluk), Maharashtra (Ahmednagar District, Rahuri and Shrirampur taluks), Mysore (Belgaum District, Hukeri taluk) and Uttar Pradesh (a part of Lucknow District). Further investigations were conducted by the NRECA teams, leading to Phase II and Phase III reports, which deal with organisational, technical and economic aspects of the projects. On the basis of Phase II and Phase III reports submitted during the period January to June 1968, the Government of India adjudged the projects as economically viable, and approved taking up Phase IV of the programme covering the construction aspect of the projects. The five rural electric cooperatives were registered as Cooperative Societies under the respective State Cooperative Societies Acts between the period July, 1969 to October, 1969.

Objectives of cooperative projects

2.31 In its Phase I Report, the NRECA Team observed :

"Agricultural productivity in India is closely tied to effective irrigation. Until such time as electricity is made available on a widespread basis with which to power irrigation pumps, there can be only limited improvement in agricultural productivity.

Exclusive of the great social benefits which accrue to an area as a result of an abundant supply of electric power, it would

seem that the potential to improve food production alone would be ample justification for launching a broad scale rural electrification programme."

The Team listed the following as the objective of, and rationale for, rural electrification through cooperatives :

(i) Furnish electricity to the rural people at the lowest possible cost in order to increase agricultural production; stimulate agro-industry; and improve the standard of living for the rural population.

(ii) Increase the responsible action of the people by giving them some degree of control of their electric supply.

(iii) Establish local organisations for the financing, procurement, installation, repair and proper use of electrical appliances and equipment such as pumpsets.

(iv) Assure a rapid and standardised pattern of construction and operation for rural electric system in all States of the Union.

The Team also observed that the establishment of rural electric cooperatives is the best way to accomplish the above objectives, for the following reasons :

(a) The State Electricity Boards indicate that they are unable to make the required return or investment on their rural undertakings, hence, they would welcome rural electric cooperatives to serve the rural areas.

(b) Alternative uses of investment capital and certain operating restrictions make it unrealistic to assume that the private sector will show initiative in constructing lines into rural areas.

(c) Neither the State Electricity Boards, nor the private sector undertakings will serve to increase the responsible actions of the people by allowing them to exercise ownership and control of their own cooperative organisation.

(d) Cooperative philosophy has already achieved a wide base of public understanding and acceptance.

(e) Rural electrification accomplished through cooperatives would have the following advantages :

(i) Owned and controlled by the people they serve. A built-in "watch-dog" effect.

(ii) Cooperative undertakings of distribution can supplement the efforts of the State Electricity Boards. This will leave these already over-extended organisations free to concentrate on generation and transmission.

(iii) Cooperatives will operate as private licensees, injecting private initiative into what is now basically autonomous Government.

(iv) Cooperatives offer great potential for economies in the design.

(v) Rural Electric Cooperatives will utilise an area coverage concept in approaching the problem. This simply means that electric service will be made available to everyone in an assigned area who wants it and can pay for it. This concept will be highly instrumental in bringing down the average cost of electric service.

2.32 The five rural electric cooperatives were registered, as we mentioned earlier, between July, 1969 to October, 1969. It was at this time that REC was also established. In accordance with its charter and the policy directives of the Government, REC took over the responsibility for financing the five pilot rural electric cooperatives. The NRECA experts had formulated detailed project reports for each of the cooperatives. These reports provided the starting point for processing of the cooperative schemes by REC on a project basis. The NRECA project reports were revised in the light of further developments in the project areas, such as construction of additional work by SEBs, increase in the demand for energisation of agricultural pumpsets and other types of demand for power. SEBs were closely associated with the revision of the project reports. The Corporation considered the revised project reports and sanctioned loans to the five cooperatives to the extent

of Rs. 12.81 crores, being 100% of the block cost of the projects including amounts required for taking over the existing assets of the SEBs in the project areas as also the amounts needed for further investment in the project areas. These loans are guaranteed by the concerned State Governments as to the repayment of principal and payment of interest.

2.33 The Rural Electrification Corporation has offered financial assistance to these cooperatives at specially favourable terms and conditions. Firstly, the period of loan is as long as 35 years compared to loans given by the Corporation to SEBs*, which are for 30 years in the case of backward areas and 20 years in the case of other areas. Secondly, the rate of interest on the loans for these cooperative projects is 4% for the first 10 years, 5% of the next 5 years, 5½% for the next 5 years and 6% for the remaining 15 years, after allowing for a rebate of ¼% at all stages for punctual payment. This can be compared with loans offered to SEBs which, in the case of backward areas, carry an interest of 5% for the first 10 years, 5½% for the next 5 years and 6% for the next 15 years; and schemes in other areas carry an interest of 6% throughout the loan period. Thirdly, the Corporation has also agreed that in respect of the loans to pilot cooperative projects, the interest at 4% for the first 5 years shall not be collected provided the cooperative in question credits the amount to a special fund to be used for certain ear-marked purposes. As in the case of loans to SEBs, a moratorium in regard to repayment of principal is also allowed to the electric cooperatives for the first five years.

Project in brief

2.34 The existing pilot rural electric cooperative schemes are based on project approach which imply that the extension of electricity will form part of a wider programme of development in the area for increasing agricultural production and stimulating the growth of rural industries. Besides, these cooperatives are

*The terms and conditions of REC loans to SEBs have been revised since September, 1971.

also based on 'area coverage' concept which implies :

(a) building up of a net work of distribution system, adequate for providing service to every one in the area who wants it ; and

(b) determining feasibility on the basis of total cost and total revenue of the entire system rather than on the basis of any particular line extension.

2.35 The implementation of the five cooperative projects is phased over a period of 4-5 years and the anticipated achievements at the end of this period and the capital outlay envisaged in respect of each cooperative project, are as follows :

Society	No. of villages to be covered	Kms of HT and LT lines	No. of pump-sets	No. of LT Ind.	No. of Dom. & Commrl. connection	Capital outlay (Rs. in lakhs)
Sircilla (Andhra Pradesh)	173	2435	10299	405	13772	295.94
Hukeri (Mysore)	107	1317	3568	309	14293	173.403
Kodinar (Gujarat)	107	1345	5422	323	13422	183.12
Mula-Pravara (Maharashtra)	167	4192	15509	743	13081	385.60
Lucknow (Uttar Pradesh)	241	1693	4117	718	8793	242.65
Total :	795	10982	38915	2498	63361	1280.713

2.36 After taking licences, the five pilot cooperatives commenced operation between October. 1970 to March, 1971. The first set of General Managers and Project Engineers of these cooperatives were given training in America. Besides, all these societies had the benefit of the advice and practical guidance of NRECA experts.

In the earlier stages, each society had a NRECA expert. Now three experts, between them are looking after all the five cooperatives.

Advisory Committee on RE Cooperatives

2.37 In pursuance of a suggestion made by NRECA Team, in its Phase I Report, the Government of India constituted, in July 1967, a high-powered Ad-hoc Committee with Secretary, Ministry of Irrigation & Power, as the Chairman and representatives of Ministry of Agriculture, Ministry of Finance, Planning Commission, Ministry of Industrial Development and Company Affairs, CWPC etc. as members. The functions of this Committee were :

(a) to coordinate the matters in the various interested Government Departments :

(b) to arrange for necessary capital funds; and

(c) to give guidance and directions to the programme and generally assist in getting the pilot projects started.

The Rural Electrification Corporation was established in 1969 and one of its main objectives is to promote and finance rural electric cooperatives. After the establishment of REC, the Ad-hoc Committee, set up by the Government, did not meet and the Corporation, therefore, set up an Advisory Committee with the Chairman of REC as the Chairman of the Committee. Besides some Directors of the Corporation, representatives of the Union Departments of Cooperation and Industrial Depvelopment are also members of this Advisory Committee, whose functions are to advise and assist the Corporation in :

(a) coordinating matters in the various interested agencies involved in the working of the pilot rural electric cooperative societies ;

(b) reviewing from time to time the financial requirements of the societies ; and

(c) providing necessary guidance in regard to the sucessful implementation of these societies.

As we mentioned in earlicr Chapter, it was this Advisory Committee which suggested the appointment of a Committee to examine the working of the existing cooperatives for considering further expansion of this programme of rural electrification through cooperatives.

V

Rural Electrification Corporation

2.38 A significant development in the field of rural electrification in the country is the establishment, in 1969, of the Rural Electrification Corporation in pursuance of the recommendations of All India Rural Credit Review Committee. This Committee, which was set up by the Reserve Bank of India, emphasised that the programme of rural electrification should be complementary to schemes for construction of wells and installation of pumpsets. Extensive use of electric pumpsets for increasing agricultural production, the Committee felt, largely depended on "how the electricity boards are enabled to find necessary resources to carry out the extension of power lines required for the purpose." The important programme of rural electrification, according to the committee, should not be handicapped by financial inadequacies of SEBs and that the rural electrification programme should be undertaken as part of a wider programme of agricultural development to ensure that the investment results in increased agricultural production and raises the income of farmers to enable them "to pay for the extension of power lines as also reasonable and economic rates of electricity tariff." For this purpose, the Committee suggested the consititution of special fund for further financing of rurall electrification with the help of grants from US owned Development Grant Funds and matching contribution from the Central Government.

2.39 The Government of India accepted the recommendation of the All India Rural Credit Review Committee and established the

Rural Electrification Corporation as a Company with the following main objectives :

(a) to finance rural electrification schemes in the country ;

(b) to subscribe to special rural electrification bonds that may be issued by the State Electricity Boards on conditions to be stipulated from time to time ;

(c) to promote and finance rural electric cooperatives in the country ; and

(d) to administer the money received from time to time from the Government of India and other sources as grants or otherwise for the purpose of financing rural electrification in the country in general.

Upto 28th February, 1973, the Corporation has sactioned 399 schemes involving a total outlay of Rs. 248.93 crores, of which the Corporation's commitment is Rs. 221.87 crores. These schemes envisage electrification of nearly 37000 villages, energisation of about 4.5 lakh pumpsets and extension of electricity to about 72000 agro-industrial and other industrial units in rural areas.

2.40 REC is an autonomous body subject to the policy directives of the Government. One of the policy directives issued by the Government to the Corporation is :

> "The Corporation may use its finances to make loans to Rural Electric Cooperatives for construction costs plus operation and maintenance costs until the schemes become self-supporting. Five pilot cooperatives are now being developed and it is expected that others will be organised on similar lines. The Corporation will consider providing loans on suitable terms to these cooperatives with a view to encouraging the cooperative type of organisation for distribution of electricity in rural areas."

The All India Rural Credit Review Committee had also suggested that the Corporation might provide loans to "electric cooperatives at a relatively low rate of interest (say 4½%) with a view to encouraging cooperative type of organisation for the distribution of electricity in rural areas."

2.41 REC has taken a keen interest in promoting rural electric cooperatives. Five pilot rural electric cooperatives have been organised so far. Besides extending financial assistance to these cooperatives on a liberal pattern, REC as a developmental financing institution, has been advising and guiding these societies on technical, financial and other aspects of their functioning. There is a cooperation division in the administrative set-up of the Corporation. Besides, officers of the technical and finance divisions of the Corporation have also been providing assistance and guidance to these pilot rural electric cooperatives. To advise it on various matters relating to the cooperatives, REC has set up an Advisory Committee on Rural Electric Cooperatives. REC is also organising conferences and seminars to provide a common forum to these cooperatives to exchange experience and discuss their common problems.

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CHAPTER III

PILOT RURAL ELECTRIC COOPERATIVES— ASSESSMENT OF PERFORMANCE

I

Limitations and Scope of Assessment

We deal, in this Chapter, with one of our main terms of reference which requires us "to examine all aspects of the formulation, organisation and working of the five Pilot Rural Electric Cooperatives financed by the Rural Electrification Corporation with a view to evaluating their preformance, problems and promise." We would at the outset, emphasise that, as these pilot cooperatives began their operation only between October, 1970 to March, 1971, it is rather early to make a final assessment of their performance or promise. Even so, an analysis of different aspects of the functioning of these cooperatives does bring out the special features and problems of cooperatives engaged in rural electrification, which could provide useful guidance for designing future cooperatives as also for streamlining the functioning of existing ones.

3.2 In this Chapter, we examine the twin aspects of the functioning of rural electric cooperatives—as an agency for implementation of rural electrification programme and as a cooperative institution. For this purpose, we evaluate the progress recorded by the cooperatives in implementing their programmes of rural electification, compare broadly their performance with that of the respective SEBs and examine their operational procedures. To assess their performance as cooperative organisations, we examine their constitution and management, analyse their capital structure and also assess their financial viability in retrospect and prospect.

II

Project Implementation

Execution of works

3.3 The five pilot cooperatives commenced operation after taking

over the State Electricity Boards' assets of the rural distribution system in their respective areas. The total cost of the five projects is estimated at Rs. 12.81 crores, of which the value of assets taken over from the SEBs is estimated at Rs. 3.2 crores, the value of new construction to be undertaken by the cooperatives being of the order of Rs. 9.61 crores. Implementation of all these projects is phased over a period of 4-5 years. At the end of this period, all the five projects together are expected to cover 795 villages, have a net-work of 12000 Kms. of HT and LT lines and over a lakh of service connections—about 39000 pumpsets, 2500 agro-based industrial units, and 64000 domesttc and commercial connections.

3.4 The details of targets fixed for the 1st year for the various cooperatives in the respective project reports, and achievement upto 31st March, 1972 in respect of construction of lines, service connections etc., are given in Statement No. VIII. The achievements for Sircilla and Hukeri cooperatives cover a period of about 17 months upto 31st March, 1972, for Mula Pravara, 13 months, Kodinar, 15 months, and Lucknow, 12 months. The progress recorded by these societies upto 31st March, 1972 as compared to the position as on the date of commencement of their operations, is a follows :

TABLE 1

	No. of months in operation upto 31-3-72	Kms. of 11 KV & LT lines taken over from SEB	Kms. of 11 KV & LT lines constructed by the Cooperatives	No. of service connections at commencement of operations	No. of service connections given by the society	Total connected load on the dt. of taking over from SEB (KWs.)	New load connected by the Society (KWs.)
Sircilla	17 months	655	832	4720	3781	7361	6665
Hukeri	17½ months	372	141	5609	1899	4323	2294
Lucknow	12 months	643	312	3396	1034	9672	2375
Kodinar	14 months	250	64	3594	867	3909	890
Mula-Pravara	13 months	1830	162	13755	1568	33060	2258

Achievement of targets

3.5 The following table indicates the percentage of first year's targets as envisaged in the project reports, achieved by the societies upto 31st March, 1972 :

TABLE 2

%age of first year's targets achieved upto 31.3.72

	11 KV Lines	LT Lines	Service connec-tions	Connected load	Village electrifi-cation
Sircilla	128	140.5	88	32	101
Hukeri	44	83	99	82	114
Kodinar	47	16	28	22.5	17
Lucknow	118	84	71	54	113
Mula Pravara	32	20	33	11	*33

3.6 The performance of Sircilla society in the construction of new lines is indeed commendable. The new lines constructed by the society have exceeded the net-work inherited from SEB. A notable feature, we observed in this cooperative, is that by applying the area coverage concept, it has, during the first year itself, electrified some of the interior villages which, in the normal course, would not have received electricity for a number of years to come.

3.7 The achievement of the Hukeri society in the construction of 11 KV lines is only 44% of the target whereas it has reached 83% and 99% of the targets for LT lines and service connections respectively. The society has thus been concentrating on intensifying electrification in the area where 11KV lines were already laid by the Board rather than on building new lines.

3.8 The Lucknow cooperative's progress in the construction of new lines is satisfactory, for, it has achieved 118% of its targets for 11KV lines and 84% of LT lines.

*No year-wise targets were fixed. The society has to electrify 64 new villages during the project period.

3.9 The performance of the Kodinar cooperative is not very encouraging although the society is situated in a progressive agricultural area. The slow progress is to be imputed mainly to the weakness of the internal management of the society as also to the general power shortage in the State and consequent restriction on the society, which led to a more cautious policy regarding new construction programme.

3.10 The Mula Pravara society has done very little construction work. This society has suffered heavy line losses of over 48%. REC, therefore, advised this society in November, 1971, to concentrate on rectification of the existing system than on the expansion programme.

Comparison with RE schemes of SEBs

3.11 One of the objectives of this experiment of rural electric cooperatives is that they should supplement the efforts of the SEBs which, at present, constitute practically the sole agency for distribution of electricity in rural areas. To consider the role of cooperatives in this field, it would be useful to examine how far the performance of the existing cooperatives compares with that of SEBs in the implementation of rural electrification schemes financed by REC. On the basis of information available with REC, we have attempted a broad comparison of the stage of implementation of cooperative schemes with the rural electrification schemes implemented by SEBs. Upto 31st December, 1972, REC had sanctioned loans to the extent of Rs. 186.41 crores in respect of 344 rural electrification schemes to be implemented by SEBs. In addition, REC had sanctioned Rs. 12.81 crores to 5 pilot rural electric cooperatives. The schemes implemented by cooperatives are not strictly comparable with those implemented by SEBs. The average loan sanctioned by REC for a rural electrification scheme implemented by SEBs is of the order of Rs. 54 lakhs, whereas it is over Rs. 2.5 crores for cooperatives. However, for a broad comparison of the performance of a cooperative with that of the respective SEB, a few schemes sanctioned by REC for that SEB more or less during the same period the cooperative project was sanctioned, have been taken together and the performance of the cooperative upto the 31st

March, 1972 has been compared with that of the SEB. The position is as follows :

TABLE 3

Percentage of achievements

Particulars	Andhra-Pradesh		Mysore		Gujarat		U.P.		Maharashtra	
	Socy.	SEB	Socy.	SEB*	Socy.	SEB	Socy.	SEB	Socy.	SEB
1. HT lines	128	51	44	N.A.	47	35	118	143	32	81
2. LT lines	140	61	83	N.A.	16	48	84	37	20	40
3. Service connections	88	67	99	N.A.	28	77	71	9	33	36

3.12 From table 3, it may be observed that, excepting in the cases of Mula Pravara and Kodinar, the performance of the other three cooperatives compares favourably 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 in 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 favourably with the performance of SEBs in the implementation of rural electrification schemes.

*No disbursement in respect of 2nd instalment of loans sanctioned in 1970-71 was made by REC upto 31-3-1972 due to inadequacy of the progress, in the implementation of the schemes.

III

Operational Aspects

Load Growth

3.13 Service connections given and new load developed are important for assessing the performance of an agency implementing the rural electrification programme. Tables 1 and 2 indicate the performance of cooperatives in this regard. As mentioned earlier, the Indian Institute of Management, Ahmedabad the Vaikunth Mehta National Institute of Cooperative Management, Poona, and the PACE Division of REC were commissioned to undertake studies of these cooperatives on certain aspects of their functioning. A common term of reference to all these agencies was to compare the performance of the cooperatives with that of the respective SEBs in regard to load and revenue growths and consumer response. The record of performance of these cooperatives in regard to service connections and load growth is analysed in the following paragraphs.

3.14 New load connected by the Sircilla society has nearly equalled the total connected load it took over from the SEBs. Load growth has also been encouraging in Hukeri which, as indicated earlier, paid greater attention to intensive development than to construction of new 11 KV lines. The area covered by the Lucknow society is comparatively backward in agriculture with the result that the demand for new connections for agriculture has been slack. The new load connected by the Mula Pravara and Kodinar societies fall short of the targets envisaged for them due to the halting progress in their new construction programme.

31.5 It is, however, important to note that while the new load connected by the Mula Pravara and the Kodinar societies has not been quite significant, the intensity of load in the distribution system they inherited from SEBs, was quite high. With all the efforts made by the Sircilla and the Hukeri societies to give new service connections and to connect new loads, the connected load

per KM of total length of lines in these societies falls short of the intensity of load obtaining in Kodinar and Mula Pravara societies, as is evident from the following table :

TABLE 4

As on 31.3.1972

	Sircilla	*Hukeri*	*Kodinar*	*Mula-Pravara*	*Lucknow*
Connected load per KM of HT & LT lines (in KW).	10.6	12.9	17	18	12.6

3.16 The PACE Division of REC made a comparative study of load growth in the Lucknow society and the Unnao scheme of UPSEB, and also in Sircilla society and the Ibrahim Patnam scheme of APSEB. This study has brought out that the record of performance of the Lucknow society has been "far more impressive than the SEB project in such a vital area of project implementation as load development." The study Report has made the following further observations regarding the Lucknow society :

> "In the matter of overall achievement vis-a-vis the targets, while both the projects failed to achieve the targets envisaged for the first year, in regard to number of consumers, the CESS* project has been way ahead of SEB project..... the CESS has been able to achieve 2.7 times that of the SEB project".

The assessment made in the Study Report is that :

> "In the matter of load development in all its facets, the CESS project emerges out as relatively more efficiently organised for project implementation than the SEB project".

*Cooperative Electric Supply Society.

3.17 The following extract from PACE Division's Report on Sircilla society points to the fact that the performance of the cooperative compares favourably with that of APSEB :

> "In the matter of overall achievements *vis-a-vis* the targets, while both the projects failed to achieve in the first twenty months the targets envisaged for the first two years, the CESS project is way ahead of the SEB project. In regard to the number of consumers, CESS has achieved 45% and in regard to connected load 32.5%, whereas the comparable figures for SEB are 25.9% and 32.7%."

The Report, however, points out that "The potential for load development in a newly electrified village has been exploited relatively better in SEB area than in CESS area.

3.18 The Indian Institute of Management studied the Hukeri society and the Raibag rural electrification scheme implemented by the Mysore SEB. The Hukeri society, according to the project report, was to give 1913 service connections in the first year; it actually gave about 1899 connections upto 31st March, 1972, that is, in a period of about 18 months. The Raibag scheme was to give about 3827 connections in the first year, whereas it gave only 518 connections in a period of about 14 months. The Study Report has observed that "the short-falls of achievement in the case of Hukeri scheme have been marginal whereas they are very substantial in Raibag."

3.19 In Gujarat, the Indian Institute of Management studied the Kodinar society and the Una rural electrification scheme of the SEB. The Kodinar society was to give 3074 new connections in the first year, whereas it released between January, 1971 and January, 1972, 867 connections. The Una scheme was expected to give 2407 connections in the first year whereas only 256

service connections were released between the same period. The Study Report observed :

> "During the first year, progress was very slow in both the schemes. Between the two schemes, the Kodinar scheme recorded higher progress than the Una scheme. However, it may be noted that bulk of the difference in the total number of connections released was due to release of about thrice as many domestic and commercial connections in Kodinar as compared to Una."

The Report also lists the following factors as inhibiting the progress of Kodinar society :

(a) Against a load of 2250 KVA requested for by the society it obtained only 1750 KVA from GEB. During 1971-72, the society paid Rs. 20,000 as penalty to GEB for exceeding the contracted load.

(b) There is repeated load shedding by GEB in the Society's area. The uncertainty of power supply has led many cultivators in the area to keep diesel engines even after installing electric motors.

The Institute took a sample of 24 wells in Kodinar area, covering 114.5 hectares. "On these wells diesel pumpsets operate for 46955 hours as opposed to only 15900 hours of operation of electric motors.....It is, therefore, obvious that only one quarter of the irrigation on these farms is done through the use of electricity. This is because of the frequent load shedding and the general lack of faith of the farmers in the reliability of electricity supply."

(c) The tariff to the cooperative comes to about 13 paise as against 10 paise assumed in the project report.

The Report adds :

> "In absolute terms, the number of connections released in Una scheme between January, 1971 and January, 1972 were lower than those in the Kodinar scheme for all categories of consumers. This happened despite the fact that there was no major handicap with respect to either the availability of power or procurement of material. Nor was there any constraint in terms of 'inadequacy' of margin between the cost of power purchased and the revenue from power sold."

3.20 The Vaikunth Mehta Institute studied the working of the Mula Pravara society and a rural electrification scheme implemented by the Maharashtra State Electricity Board in Poona district. The Study Report observes that :

> "The two areas viz., rural areas in the Poona area electrified by the MSEB and the areas in the society's jurisdiction are not comparable because in the Poona area, electricity started for the first time by the middle of the 1971 and the number of consumers increased rapidly since power was initially available in the area during 1971-72; while in the society area the consumption pattern was more or less stabilised at the time of take over."

Even so, the Study Report mentions :

> "In the case of Mula Pravara Society, the rate of growth of load was higher upto March, 1971 but declined and stabilised after that; while in the case of the Maharashtra SEB area, the rate has increased continuously from 30th June onwards."

Energy sales

3.21 The principal business of a rural electric cooperative consists of buying and selling of power. The achievement of the cooperatives upto 31st March, 1972 in respect of connected load, sale

of energy and financial results *vis-a-vis* the position envisaged in the project reports, are as follows :

TABLE 5

	Target for 1st year as envisaged in the Project Reports				
	Connected load (KW)	Energy sales KWHS	Energy sales Amount (in lakhs)	Line losses (lakh units)	Profit/ loss (in lakhs)
	1	2	3	4	5
Sircilla	20267	106.66	18.83	10.67	+0.24
Hukeri	2045	61.18	9.134	6.8	—1.854
Kodinar	3957	104.33	18.75	11.60	+3.33
Mula-Pravara	16715	276	51.158	30.36	+6.32
Lucknow	4400	164.99	27.696	18.33	+1.74

	Achievement from 1.4.71 to 31.3.1972				
	Connected load (KW)	Energy sales KWHS (lakhs)	Energy sales Amount* (in Lakhs)	Line losses (lakh units)	Profit or loss for 71-72
	6	7	8	9	10
Sircilla	6665	77.72	16.08	29.74	—0.43
Hukeri	2294	53.02	12.40	25.63	+0.90
Kodinar**	891	34.38	7.40	11.56	—2.73
Mula-Pravara	2258	283.56	56.66	283.46	—18.21
Lucknow	2375	104.51	22.46	37.20	—1.06

*Includes miscellaneous revenues.

**From July, 1971 to 31st March, 1972.

3.22 Excepting for Mula Pravara, none of the societies reached the annual target of energy sale for 1971-72. The short-fall was nearly 27% in Sircilla, 13% in Hukeri, and 36% in Lucknow. Due to general power shortage in the country during 1972-73, the energy sales are likely to fall further short of the targets for the second year envisaged in the project reports. It is interesting to note the although the Mula Pravara society achieved hardly 11% of the target for connected load in the first year, it is the only society which has reached and even marginally exceeded the target for sale of energy in the first year. This is due to the fact that the society is situated in a rural area characterised by progressive agriculture with an accent on cash crops like sugarcane and also a developing agro-based industrial structure. There are, in the society's area, three cooperative sugar factories and a cooperative spinning mill. As energy sale is practically the only source of income for the societies, any short-fall in it distorts the financial results envisaged in the project reports.

Composition of load

3.23 The following figures indicate the percentage composition of load in the five cooperatives as on 31st March. 1972 :

TABLE 6

%age of connected load to total as on 31.3.1972

	Sircilla	Hukeri	Kodinar	Mula-Pravara	Lucknow
1. Agriculture	81.5	51.33	34.38	76.7	36
2. LT Ind.	8.3	25.95	22.91	5.9	26
3. HT Ind.	Nil	9.12	8.33	8.8	30
4. Domestic	7.7	12.24	33.75	8.4	8
5. Commercial	1.98				
6. Street lights	0.52	1.36	0.63	0.2	
	100.00	100.00	100.00	100.00	100

While in Sircilla 82% of the connected load is accounted for by agriculture and 8.3% by LT industrial connections, in Lucknow, only 36% of the total connected load is accounted for by the agriculture, while industrial load accounts for 56%—26% by LT industrial

and 30% by HT industrial connections. The industrial estate as well as the aerodrome near Lucknow is within the area of the Lucknow cooperative. Of all the societies, Kodinar has the most paying load composition, for, over 34% of the total connected load is accounted for by domestic, commercial and street lighting. The preponderance of agricultural load combined with low tariff for agriculture, renders it more difficult for cooperatives to become financially viable.

3.24 A detailed comparative study of energy sales and revenue growth in the cooperatives and the control areas in the respective SEBs has been made by the PACE Division in respect of Lucknow and Sircilla societies. This study shows that the engergy sales and revenue growth in cooperatives are comparatively better. In respect of Lucknow society, the Report observes :

"In terms of enegery sold, the CESS projects' achievements being as high as 36.97% of the targets as against only 9.2% of the SEB project, and, in terms of revenue realised, the CESS project having achieved 82.6% of the targets as against 14.4% by the SEB project."

Regarding the Sircilla society, the Report notes :

> "In terms of sales, the CESS project has achieved 72.9% of the targets as against 4.1% for the SEB project. In terms of revenue realised, the CESS project has achieved 69.8% whereas the SEB project's achievement is only 4.36%."
>
> "The revenue realised per Rs. 1 lakh of investment is much higher in the CESS project than the SEB project."

Consumer response and servicing

3.25 A major advantage of a cooperative is that being a democratic and autonomous organisation of consumers with a separate technical and administrative machinery answerable to the members, it would be more responsive to the needs of its consumer members. A major objective of the Study entrusted to the IIM and others was to ascertain how far the cooperatives have, in practice, been

responsive to the needs of their consumers. These study Reports confirm that, in practice, cooperatives are generally able to pay greater attention to the quality of service to their consumers. The easy access the consumers have to the chief executive and the project engineer in a cooperative tends to ensure better and more prompt attention to the requirements of the consumers.

3 26 The Report on Kodinar society makes the following observations regarding consumer response in the society :

> "In Una, farmers expected that it would take nearly ten months to get an electric connection, whereas in Kodinar farmers expected to get a connection in a couple of months"
>
> "The consumers in the cooperative area feel that rural electric cooperatives are able to adjust to their needs a little more quickly and easily than is the State electricity board. They therefore preferred the cooperative organisation. A large number of farmers in the control area also thought in the same direction."

3.27 Regarding consumer response in Hukeri society, the Study Report observes :

> "All the respondents in Hukeri were of the opinion that the general experience of the people in their area of obtaining a connection was encouraging. As far as they themselves were concerned, they were completely satisfied with the way things were moving. In Raibag, on the other hand, this response was of a somewhat more moderate nature. In Hukeri, respondents expected to get a connection within two to three months, whereas in Raibag farmers expected that it would take more than six months to get an electric connection."
>
> "There were generally fewer and less frequent complaints from the cooperative consumers as compared to those from the SEB consumers. The SEB consumers also complained more about the unreliability of supply."

3.28 The Report on Sircilla and Lucknow societies has brought out that the consumers of cooperatives normally have a higher expectation of more prompt and efficient services. The average waiting period for service connection, it is reported, is generally longer in SEB area as compared to the area of the Lucknow cooperative. However, in the case of Sircilla society, the Study Report points out that the waiting period is slightly less in the SEB area. Both Sircilla and Lucknow societies, it is reported, have made some efforts in educating the consumers regarding fuse blow-out etc. Such efforts in the corresponding SEB areas are lacking. Another aspect which the Study Report has brought out is that, generally, cooperatives pay greater attention to giving prior notice to the consumers regarding scheduled breakdowns.

3.29 The consumer response and servicing in the Mula Pravara society is not encouraging. The Study Report reveals that in the case of Maharashtra SEB, 64.51% of connections were given within three months of application while in the case of the society, 52.02% only of the connections were given within three months from the date of application. The Report adds :

> "The Maharashtra State Electricity Board Administration is slightly more efficient in the matter of giving connections in time. The society had to face a number of difficulties such as non-availability of electric poles and other materials etc. which probably caused delay in giving connections. In view of these difficulties which smaller organisations have to face, it would not be incorrect to say that the society's performance compares well with that of the Maharashtra State Electricity Board."

While examining the delays in giving service connections, it should be remembered that in the case of Mula Pravara society, the cooperative was advised by REC to concentrate on rectifying the existing system rather than on expanding the lines, and this had, in no small measure, contributed to the go-slow policy of the cooperative in its construction programme and in extending service connections.

3.30 As regards the quality of service by the Mula Pravara society, the study Report has brought out that :

(i) It would appear that the power supply is not regular at present as it was when the area was under the Maharashtra SEB.

(ii) In the society area, the break downs are too frequent as compared to those in the MSEB area.

(iii) The machinery of the society for rectifying the line faults is not efficient as in the Maharashtra SEB area.

Area coverage

3.31 The area coverage concept, as we explained earlier, requires a society to determine its line extension policies on the basis of overall economics of the scheme and not on the economics of a particular line extension. In a situation characterised by deficits, which seem to be inherent in the business of rural electrification due to inadequate margins, it has become difficult for a cooperative to adopt the area coverage concept. The SEBs normally lay down certain yard-sticks for extension of service connections, and these, we understand, are not strictly based on commercial considerations. In this context it is not easy for cooperatives to adopt a more liberal policy of line extention than that of SEBs. The Indian Institute of Management, in its Reports on Hukeri and Kodinar cooperatives, has pointed out that the cooperatives follow the same procedure for extending the lines and giving new connections as those of respective SEBs. In Hukeri, the estimated cost of connection for agricultural and industrial connections should not exceed Rs. 1250 per connected H.P. The consumer guarantees a revenue return of 18% per annum for seven and a half years. In Kodinar, the cooperative like the Gujarat SEB adopts a group approach for granting new connections. The new connections are given if the total revenue is equal to more than 15% of the cost of providing connections. The IIM has expressed the view that the group approach adopted in Gujarat often leads to wasteful efforts. For example, a group of cultivators in Una made a deposit in 1971, but till September, 1972 no connection was given because the return was only 14.8% as against the prescribed criterion of 15%. In respect of Hukeri, the IIM observed that

while the economic viability must be demonstrated, application of rigid rate of revenue criterion for each consumer is not likely to extend the scope of electrification. During our visits to the societies, we suggested that the cooperatives should also keep in view the area coverage concept in extending service connections. The decision to extend service connections should also be related to the estimated revenue from the composite load that would be emerging in the area comprising agricultural, commercial, industrial and domestic loads.

3.32 The Lucknow and the Sircilla societies have been, to some extent, adopting the area coverage concept. The Sircilla society, as we mentioned earlier, has electrified some of the remote villages even in the very first year of its operation. In the initial period, the society took up electirification of those villages which could give a gross return of 10%. But the society soon revised this procedure in favour of an area coverage approach. The Board of Directors of the society resolved in their meeting held in October, 1971 :

> "While appreciating the need for fixing gross minimum return on the scheme to be sanctioned and executed, it is felt that introduction of such a system at this stage will retard the steady progress as the society has been executing the works on an area coverage basis, and any change now would be resented by the villages to be electrified in future. The Board however, directs that as far as possible, the schemes should be made remunerative by persuading the consumers to make domestic connections."

3.33 The Lucknow society is also not following any rigid formula for its line extension programme. In fact, the line charges levied by the Lucknow society are more favourable to the consumers than in SEB area. The cooperative does not charge any line charges upto 1600 meters for agricultural connections whereas such free extension is confined only to about 600 meters in the case of SEB. Mr. Diddle, in his Evaluation Report on Five Rural Electric Cooperatives in India, submitted in June, 1971, observed : "The approach of rural electric cooperatives has been more encouraging to the needs of the rural people. Their line extension policies are more liberal and do not seek payment from the people."

Projectapproach

3.34 The overall economic development of the area implicit in the project approach, calls for an effective coordination of activities of various developmental agencies including the rural electric cooperatives, the agricultural credit institutions, agency for development of underground water potential, organisations for promotion of small scale industries etc. It is only the Lucknow cooperative which has succeeded in associating various developmental agencies with its activities. To coordinate the activities of these societies with those of minor irrigation and small scale industries departments, and credit institutions in the area, a meeting of the District Programme Coordination Committee is held every month, which is presided over by the Additional District Magistrate (Planning), and the General Manager of the society is the convenor of this meeting. A representative of the society also attends the fortnightly staff meetings of the Block Development Officers to explain the progress and programme of the society and to enlist the assistance of VLWs for load growth. The General Manager of the society also attends the quarterly meetings and the divisional meetings presided over by the Commissioner. Such close coordination is yet to be brought about in other societies. For example, in one society, it was found that the ground water organisation had ruled out the possibility of sinking wells in certain villages which were to be electrified by the cooperative; but the cooperative was not aware of this.

3.35 REC has recommended to the cooperatives to set up a Coordination Committee at the project level and also a State Level Coordination Committee. The State Level Coordination Committees are yet to be established. The project level committees in most of the societies are either yet to be set up or to commence functioning.

IV

Line Losses

General position in Rural Electrification

3 36 Line losses constitute the 'Achilles' heel' of rural electric cooperatives. The problem of line losses, it is relevant to note, is not a special feature of cooperatives. It is inherent in rural distribution in the country. A meeting convened by REC on 3rd

August, 1971, observed : "The failings which the cooperatives have brought to light are not the failings of the cooperatives themselves, but those inherent in the system which the cooperatives only help to bring to light."

3.37 The line loss for the electric distribution system in the country during 1969-70 was 18%. In 1969-70, the total energy sold to ultimate consumers in the country was of the order of 41062 million KWHs; of this, 70.6% was delivered to HT industrial consumers. The line losses in HT distribution should be considerably less than in the LT distribution which includes rural distribution also. It has been estimated that if the line losses in HT distribution were only 5%, the line losses in LT distribution including rural distribution would be 35.5%, and if the line losses in HT distribution were assumed at the 10%, the loss in LT distribution would be about 30.6% for the country as a whole for 1969-70. On this basis, the loss in LT distribution system in SEBs for 1969-70 and the percentage of line loss in cooperatives for 1971-72 are as follows :

TABLE 7

%age of line losses

		In LT distribution in SEBs for 1969-70 (Estimated)		Line loss in the cooperative in the State upto 31.3.72
		On the basis of 5% loss in HT distribution	On the basis of 10% loss in HT distribution	
1.	Uttar Pradesh	30	36.2	26.25
2.	Andhra Pradesh	38.6	36.5	27.4
3.	Gujarat	32	27	24.7
4.	Maharashtra	32.6	23.2	48.29
5.	Mysore	38	32.8	34

State-wise estimated figures of line losses in SEBs are given in Statement No. XII. The Indian Institute of Management, in its Report on Kodinar society, had also observed "For the period between January, 1971 and March, 1972, line losses in Kodinar society amounted to 25% whereas it was 39% in the Una area." Referring to line losses in Hukeri, the Study Report mentions that : "In rural areas however, the Board officials conceded that the losses could be as great as those incurred by cooperative." When we visited the Mula Pravara society and the neighbouring SEB area, we were informed that the line losses in the SEB area were comparable to those obtaining in the cooperative.

3.38 Another interesting trend noticed in the country is that the percentage of line losses is higher in States where agricultural consumption accounts for a larger percentage of total energy consumption in the States, as may be evident from the following table :

TABLE 8

(For 1969-70)

	%age of consumption by Agriculture	%age of overall line losses in the State (Actuals)	%age of line loss estimated in LT distribution assuming loss in HT distribution at 10%
1. Andhra Pradesh	17.5	24.2	36.5
2. Haryana	30.4	28.6	38.6
3. Punjab	32.2*	33.4	39.4
4. Tamil Nadu	23.0	17.6	30.8
5. Uttar Pradesh	13.4	22.2	36.2
6. All India	9.2	18	30.6

It would be relevant to note in this connection that the percentage of agricultural consumption in cooperatives is fairly high, as indicated earlier.

*Excluding Nangal Fertiliser consumption.

3.39 It is reported that the line losses in other countries varies from 5.7% in West Germany to 7.7% in France, 7% in USA and 12.5% in Sweden. In India, it has been estimated that saving due to 1% in line losses would mean a saving of more than Rs. 5 crores. Referring to the reasons for line losses in the country, the Power Economy Committee (March 1971) made the following observations :

> "There are no norms for transmission and distribution losses. They depend to a large extent on the configuration of the transmission and distribution systems. The loss would be small when generation is well distributed over an area and near the utilisation point and the number of transformation stages are small. The losses are small in systems where load densities are high i.e. in compact systems. The commercial lighting and domestic lighting sales in India constitute only about 15% of the total aganist 47% in U.K., 53% in Australia, and 69% in New Zealand. Our industrial loads account for about 70% of the sales. Our agricultural loads account for about 7 to 8% of the total sales. The above pattern of load results in lower power factor and hence more losses.
>
> The main reasons for higher transmission losses in India are (a) transmission and distribution of energy over long distances and large number of transformation stages, (b) inadequate sizes for conductors, (c) loads being predominantly industrial and agricultural which have low power factor, (d) lack of proper interconnections/integrated operation, (e) unauthorised tapping of energy without being metered. Generally speaking reduction in energy losses due to transmission and distribution involves greater capital investment. Therefore, savings effected by reduction in energy losses and extra investment required by the system for reducing energy losses have to be balanced and it may not be economical to reduce the energy losses beyond a certain limit. In other words, losses should be reduced to an optimum value after making a techno-economic study."

Performance of cooperatives

3.40 The project reports of the five cooperatives envisage a line loss of only 10%. The actual line losses obtaining in the cooperatives and estimated for the rural distribution system in the country tend to emphasise that the project estimate of line loss of 10% is beyond the realm of practicability. The actual line losses incurred by the cooperatives varies from 25% in Kodinar to over 48% in Mula Pravara. One of the basic objectives underlying the pilot cooperatives is that, being owned and controlled by the people they serve, there will be a built-in control over line losses. The extent of the problem in the cooperatives and the efforts made by them to control line losses need careful analysis.

3.41 The following figures reflect the magnitude of the problem of line losses in individual cooperatives :

TABLE 9

(Lakh units)

	Units purchased upto 31.3.72	Units sold upto 31.3.72	Total line losses	%age of line losses
1. Sircilla	145.97	106.63	39.34	27.4
2. Hukeri	115.00	75.21	39.79	34
2. Kodinar	74.61	56.18	18.43	24.7
4. Mula Pravara	613.21	316.82	296.39	48.29
5. Lucknow	141.71	104.51	37.20	26.25

The problem of line losses, it may be noted, is particularly acute in Mula Pravara and Hukeri societies.

3.42 The immediate effect of line losses is on the financial viability of the society. The total financial loss sustained by the societies

upto 31st March, 1972 and the financial loss due to line losses exceeding the project estimate of 10% are as follows :

TABLE 10

(Rs. in lakhs)

	Total profit or loss as on 31.3.1972.	Purchase price of energy involved in line loss exceeding 10%
1. Sircilla	—1.07	—2.34
2. Hukeri	+0.90	—2.09
3. Kodinar	—4.60	—1.41
4. Mula Pravara	—18.91	—21.16
5. Lucknow	—0.13	—2.31

All societies excepting Kodinar would have shown considerable profit had their line losses been confined to only 10%. The problem of line losses has been the least in Kodinar where the percentage of line loss upto 31st March, 1972 was only 24%. The financial loss sustained by Kodinar is to be imputed mainly to unfavourable tariff for bulk power to which we shall refer later. The most disappointing performance is made of Mula Pravara society which had recorded a line loss of over 48% upto 31st March, 1972. During 1971-72, the total revenue to the society from sale of power was Rs. 51.16 lakhs whereas the purchase price of power to be paid to the SEB was Rs. 51.55 lakhs. In other words, the society incurred a gross loss due to heavy line losses.

Analysis of line losses in cooperatives

3.43 The line losses in cooperatives could be broadly divided into two main categories : (i) loss due to the inadequacy of the system; (ii) loss due to inadequacy of management, which directly cuts into the revenues of the society. Losses included in the first category are inherent in the system which may be difficult to control without substantial investment and where the savings effected may not be commensurate with the order of investment required.

There are, however, certain improvements which could be made to the system to yield substantial results. The second category of inadequacy of management includes defective meters and metering and theft of energy.

System losses

3.44 We are not a technical committee to examine, in detail, the various technological factors that have contributed to the system losses in the cooperative area. However, the distribution system in the Mula Pravara area was studied by a Superintending Engineer of the Maharashtra State Electricity Board and, according to him, the system losses in the area is of the order of 22%. The Mula Pravara society has approached technical consultants for an appraisal of its distribution system and for suggestions for revamping it.

3.45 In Sircilla, according to the project report, the SEB was to supply energy to the cooperative from six sub-stations. So far, only two sub-stations are in position. This has led to overloading of lines and consequent line losses. In Lucknow also, the SEB was to supply energy to the cooperative from 7 sub-stations whereas only 3 sub-stations are in position now. On the basis of the experience of the cooperatives, REC has since introduced a system improvement loan to SEBs for effecting technical improvements to the rural distribution system for bringing down line losses, and the SEBs have been advised that they should undertake this system improvement on a priority basis in the area of the cooperatives.

Under-loaded transformers

3.46 Under-loading of transformers has also contributed to line losses particularly in Lucknow where a number of transformers have peak loads of less than 50% of the capacity of the transformers.

Defective meters

3.47 Another major factor contributing to substantial line losses in the cooperatives, we have observed, is defective meters—both at the point of purchase of energy from the SEB as well as at consumers' points. In Lucknow, the meter installed by the SEB at

sub-stations where the cooperative is drawing its supplies were found to be defective. When our Committee, during its visit to Lucknow took up this matter with the Chairman and other officers of the U.P. State Electricity Board, SEB agreed to remedy the situation. The society has since written to the SEB claiming a refund of Rs. 1.16 lakhs for 1.16 million units involved in defective metering. In other societies, the meters at the consumers' end require to be checked and replaced on a large scale. For example, in Mula Pravara, of the 3000 meters tested, nearly 25% had stopped and another 35% were either damaged or running slow. In other words, nearly 60% of the meters installed were defective. Incidentally, these cooperatives could not have test benches when they began their operations. Now all the societies have acquired test benches and have begun a programme of meter testing.

Theft of energy

3.48 Pilferage of energy is another important factor contributing to line losses. The Indian Institute of Management, in its Report on Hukeri, has pointed out : "Our discussions with the technical personnel lead us to believe that even with no pilferage, there would be about 18-20% line losses. By these accounts, it appears that between a third and a half of total line losses are because of pilferage in Hukeri." In the case of Mula Pravara society, the Vaikunth Mehta National Institute of Cooperative Management has observed : "During the Maharashtra State Electricity Board Administration, the consumers in the area were accustomed to certain facilities which the Board could give either by deliberate decision or the consumers got because of the lapses in the Board's administration. The moment the society took over, the consumers suddenly found that they were denied these facilities which they used to enjoy in the past and also found that their energy bills had suddenly gone up substantially. The only probable reason for electricity bills suddenly going up after the society took over could be that the society tried to curb illegal pilferage of electricity which apparently during the Maharashtra State Electricity Board Administration went unnoticed. ...Apparently, during the MSEB Administration, the Board could afford to ignore this phenomenon of pilferage and still continue to

distribute power in the areas." During our visit to the Mula Pravara society, we found that some of the Directors were complaining that, after the society came into being, the amount of consumers' bills had gone up.

3.49 During our visits to cooperatives, we focussed attention of the cooperatives on this crucial aspect of line losses. Some of the cooperatives have, in recent months, made efforts to bring down the line losses. For example, the Hukeri society has brought down its line losses from an average of 34% upto 31st March, 1972 to 26.69% for the period from April, 1972 to July, 1972. The Hukeri society has taken the following specific steps to bring down the line losses.

(a) When the society took over from the SEB, there were 1600 services which were not metered. The society has since metered all these services.

(b) Many of the meters which the society took over from the MSEB were reported to have been not sealed and the society has since sealed all of them.

(c) The society launched an intensive programme of testing all the industrial meters with the help of the MSEB. It obtained a test bench in August, 1972 and has initiated a large programme of meter testing.

(d) The society also undertook the innovation programme of transformers.

3.50 The other society where line losses have been high is Mula Pravara society. After the Administrator took over in August, 1972, systematic efforts have been made by the society to bring down the line losses. As against an average line loss of 48.29% upto 31st March, 1972, the line losses in December, 1972, came down to 35.56%. This is indeed an encouraging trend in the society.

3.51 It should be emphasised that the problem of line losses has not received adequate attention of the management of these societies. A basic weakness in these societies is that, practically, no

society has attempted effective feeder-wise control of the distribution system including line losses. REC has since written to all the societies to institute a system of feeder-wise control of line losses and to make the field staff responsible for effecting substantial savings in line losses.

V

Constitution and Management

Structure of Cooperatives

3.52 The basic objective of any cooperative is to render certain services to its members as economically as possible. Provision of efficient and economic services will depend on the control and direction of its operations. Matters relating to internal administration of a cooperative are therefore of crucial importance for its successful functioning. The related issues which are important in this context are : democratic control over the overall operations of the cooperative; relations between the elected management and the professional management and proper delegation of powers to the chief executive to match his responsibilities; and constructive supervision over the functioning of the cooperative.

3 53 The internal administrative structure of a cooperative is a three-tier one, consisting of : (a) the general body of members; (b) the Board of Directors; and (c) the paid management. In terms of the Cooperative Societies Act, the supreme authority in a cooperative vests in the general body of members. General direction and control is to be provided by the Board of Directors headed by the Chairman. The paid professional management has to implement the programmes and policies laid down for it and to look after the day-to-day administration of the society. We shall examine how far the internal administration of these societies has been conducive to their effective and efficient functioning.

Membership

3.54 The details of membership of all the five societies are given in statement No. II. An analysis of the membership of these societies brings out the following salient points :

(a) All the societies together have taken over nearly 31000 service connections from the State Electricity Boards. Of these, only 3716 or 12% of the people to whom service connections were given by the SEBs have become members of the cooperatives. The position remains more or less the same in all the cooperatives.

(b) The Sircilla and the Kodinar cooperatives have enrolled all persons to whom new service connections were given by them as members. In Mula Pravara, over 80% of the persons to whom new service connections were given by the society are yet to become its members.

(c) While the total membership of the secieties is of the order of 25000, nearly 14000 members are yet to receive service connections. The number of such prospective consumers is quite large in all the societies excepting Hukeri.

3.55 Normally, a cooperative is expected to deal only with its members. But a rural electric cooperative has to obtain a licence under Section 3 of the Indian Electricity Act, 1910 to supply energy in its jurisdiction. In terms of Section 22 of the same Act, a licencee is obliged to provide electricity to everyone in its area who demands it and is willing to pay for it. As a cooperative, under the statute, is obliged to give service connections, there seems to be reluctance on the part of those who have already received service connections to pay share capital to a cooperative and become its members.

Involvement of members

3.56 Special mention need to be made of the efforts made by the Sircilla society to enthuse members and prospecitve members to participate in its activities. A unique feature of this society is the voluntary labour (Shram Dan) put in by members and prospective

members. The items of work done by the consumers themselves as Shram Dan are :

(a) Carting of the poles to the village site.

(b) Digging of pits for the poles.

(c) Erecting the poles.

(d) Stringing the conductors.

Shram Dan has helped the Sircilla society to keep the capital cost low. It is estimated that the savings of the society on account of Shram Dan is 5-6% of the total estimated block cost. This is indeed a creditable record for the cooperative. On the lines of the Sircilla society, the Lucknow cooperative has recently initiated a similar experiment.

General body

3.57 The average membership of the existing five pilot societies is about 5000. It is, therefore, not convenient for a society to hold the meeting of all the members. Nor is any fruitful discussion at such a gathering possible. In such a situation, cooperatives normally have a system of representative general body, that is, a system of delegation in which the individual members will not directly elect the Board of Directors of the society, but will only elect the representatives who will elect the Board members. In a representative general body, there will not be any general meetings of all the members; instead they may be convened to a number of local meetings to elect the representatives to the general body of the society. The representative general body consisting of representatives elected by various local meetings are vested with the powers of the general body and exercise its functions. REC has suggested to all the rural electric cooperatives to institute the system of representative general body. The bye-laws of the Sircilla society have since been amended to provide for a representative general body, and the society has actually constituted such a body. Every village can send one representative to the representative general body of the society, and where the total number of members in a village exceeds 250, that village can send one additional member. In the case of Kodinar, it has been

reported that the members are not willing to have a representative general body. The Lucknow cooperative has a provision in its bye-laws for a representative general body, but it is yet to be constituted. The Mysore and the Maharashtra Cooperative Societies Acts have no specific provision for constitution of such representative general bodies. Necessary amendments to the existing cooperative legislations in these States is under consideration of the State Governments. There are, however, a number of instances where, without a specific provision in the Act, representative general bodies have been constituted in certain types of societies. The Maharashtra Government have since agreed that the possibility of amending the bye-laws constituting a general body even before amending the Act, will be examined by them.

Board of Directors

3.58 Normally, the Board of Directors of a cooperative is to be elected by the general body. The bye-laws of the Hukeri society provide that the first Board of Directors including the Chairman shall be nominated by the Registrar of Cooperative Societies for the first three years. In Sircilla, the entire Board of Directors including the Chairman and the Vice-Chairman is to be nominated by the Registrar for three years which period may be extended by another three years. The bye-laws of the Lucknow society provide that the Board of Directors including the Chairman and the Vice-Chairman may be nominated by the Registrar during the first five years after the registration of the society. In Kodinar, the first Board of Directors is to be nominated by the Government for three years and it is understood that this has been further amended to extend the nomination by another three years. The Ad-hoc Committee appointed at the time of the registration of the Mula Pravara society continued to function as the Board of Directors of the society till August, 1972 when the Registrar superseded the Board of Directors and appointed an Administrator in its place.

Chairman

3.59 In Hukeri, the Joint Registrar of Cooperative Societies of the region is the Chairman. In Sircilla, the Collector of the

district is the Chairman. In Lucknow and Kodinar, a non-official was nominated as Chairman. The Mula Pravara Society had also a non-official Chairman till August, 1972. Judged by the performance of the cooperatives, the experience of both Hukeri and Sircilla societies which have official Chairmen, has been good. In Mula Pravara, due to deep fissures which developed within the board of management, the Registrar had to supersede the management and appoint an Administrator. In Lucknow, the Registrar has recently nominated the District Magistrate as the Chairman of the society in place of a non-official Chairman.

General Manager and Project Engineer

3 60 It is on the two key executives—the General Manager and the Project Engineer—that the efficient functioning of a rural electric cooperative mainly depends. Sircilla and Hukeri societies have joint Registrars as General Managers. A Deputy Registrar was the General Manager of the Kodinar and the Mula Pravara societies. The Lucknow society has an Executive Engineer of SEB as its General Manager. All these officers are on deputation from their respective Departments. The Project Engineer in all the societies excepting Kodinar are also officers on deputation from SEBs.

3.61 The first set of General Managers as also the Project Engineers were trained in America. A stage has reached when all these trained personnel are gradually being replaced by others who have not had such training. The trained General Manager of the Lucknow society has already left the society. Similarly, the trained General Managers of Sircilla society as also that of the Kodinar society have left the services of these societies. In fact, Kodinar has no General Manager since September, 1972. The trained Project Engineers in Lucknow, Sircilla, Mula Pravara and Kodinar have also left the services of the societies. Selection of suitable personnel as General Managers and Project Engineers may pose a problem to these societies.

Delegation of powers to the Chief Executives

3.62 A basic weakness in the administration of many of these societies is the absence of clear demarcation of functions between

the Board and the chief executives, and lack of delegation of powers to the General Manager and Project Engineer. In one of the societies, the General Manager has to approach either the Chairman or the Board for practically every small sanction. In the case of Kodinar society, the Indian Institute of Management has observed : "The organisational structure of Kodinar society is not conducive to the efficient working of the scheme. All matters were decided by the Board of Directors and hardly any powers were delegated to the senior executives." In respect of Mula Pravara, the Vaikunth Mehta National Institute of Co-operative Management has pointed out : "The Manager and the Project Engineer are appointed by the Board and responsible directly to the Board. The relationship between the two is not clear. This resulted in a clear dichotomy between the Administrative Department under the Manager and the Technical Department under the Project Engineer."

Staff Strength

3.63 The Administrative charts of the societies are at Annexure XV. The capital base of the society as on 31st March, 1972, the operation and maintenance expenses incurred during 1971-72 and the total revenue realisation for the year are as follows :

TABLE 11

(Rs. in lakhs)

	Capital investment	Total revenue for 1971-72	O & M expenses during 1971-72
1. Sircilla	94.35	16.08	2.63
2. Hukeri	68.20	12.40	1.92
3. Kodinar*	31.58	7.40	1.80
4. Mula Pravara	194.25	56.66	7.45
5. Lucknow	83.81	22.46	9.66

*For the period July, 1971 to March, 1972.

The percentage of operation and maintenance expenses to gross revenue works out to 16.4% in Sircilla, 15.5% in Hukeri, 13.1% in Mula Pravara and 16 3% in Lucknow. The percentage of operation and maintenance expenses to capital base works out to 2.8% in the case of Sircilla and Hukeri, 3.8% in Mula Pravara and 4.3% in Lucknow. The actual percentage of operation and maintenance expenses to the capital base may be still less when we consider that amount of capital investment indicated above does not include the additional amounts to be paid to the SEBs for the assets taken over from them. Further, although some construction works have been completed and these have been commissioned, work orders have not been closed and in the accounts of these societies, the works were still shown as 'work in progress'.

3.64 Regarding the staff strength, the Vaikunth Mehta Institute has observed that the Mula Pravara society is under-staffed in terms of standards prescribed by the Maharashtra SEB. In Kodinar society also the IIM pointed that "the maintenance and construction work has been retarted in the cooperative due to lack of staff" In the Hukeri society, the staffing strength is slightly lower than the one admissible in the SEB.

Recruitment

3.65 The General Managers of the societies are all on deputation either from the SEB or from the State Cooperative Departments. Excepting Kodinar, all the others have deputationists as Project Engineers. In Lucknow, excepting for one Assistant Engineer, who has been directly recruited by the society, all the other key personnel in the technical, administrative and accounts divisions of the society are on deputation from various government departments and SEBs. In Sircilla, Hukeri and Mula Pravara also, all the key personnel are deputationists. The Indian Institute of Management, in its report on Hukeri, has remarked "Even though the organisational structure of the Hukeri cooperative is fairly pragmatic and performance oriented, it must be noted that the results have been achieved primarily with deputationist personnel."

System Management

3.66 A specific term of reference given to the Vaikunth Mehta Institute was to examine the system of internal management of the Mula Pravara society. In its Report, the Institute has made the following observations :

(i) There are large organisational gaps. Some of the important functions are totally neglected or attended on 'ad-hoc' basis. Member-relation, public-relations and member-education, the function so important to any cooperative form of organisation are completely omitted.

(ii) The span of control at the Project Engineeer's level is too wide. It is, at present, 1:14.

(iii) There is duplication of some of the important functions, leading to controversies and illogical division of staff.

(iv) Job-descriptions and written specifications of duties were not available for any of the posts either in the Administrative Department or Technical Department. For example, Office Superintendent is working just as assistant to the Manager, doing the jobs assigned to him by the Manager from time to time mostly on ad-hoc basis..... In the absence of written job-description and specified job-charts, the supervision is ineffective.

(v) There is a widespread belief amongst the public, consumers and the members that the technical staff of the society 'connive' with the consumers in tampering with the meters and live-lines, obviously resulting in theft of the electricity supplied by the society.

We have also noted, as we mentioned earlier, that practically in all societies, the feeder-wise control over the distribution system which is vital for economic and efficient operations, is significantly absent.

Material Management

3.67 Inventory control is another area which requires greater attention in these cooperatives. The value of new works executed

by cooperatives upto 31st March, 1972 and the value of stores held by them on 31st March, 1972 are as follows :

TABLE 12

(Rs. in lakhs)

	Value of new works executed	Value of stores held
1. Sircilla	33.68	7.82
2. Hukeri	22.17	6.32
3. Kodinar	9.09	25.07
4. Mula Pravara	22.07	7.01
5. Lucknow	26.39	10.71

The Kodinar society had piled up substantial inventories. Even so, it could not proceed with the construction work according to the programme because of lack of poles. We also noted that this society piled up stocks of 1000 three-phase-three wire LT meters and about 20 tonnes of GI wires, which it did not actually need. This points to the imbalance in inventory building and the futility of piling up of large unbalanced inventories. No attempt has been made to relate the maximum and minimum limit of materials to be held in the stores with reference to the paractical programme of construction. In one society, the management resorted to emergency purchase of certain items without tenders even though the same items were available in its stores. A system of periodical physical verification of stocks is also absent in most of the societies.

3.68 In the initial period, cooperatives were relying considerably on obtaining their requirements of material from SEB. Because of the centage being charged by SEBs, the societies gradually resorted to purchase from the open market. The Vaikunth Mehta Institute has pointed out that the Mula Pravara society kept Rs. 25 lakhs as deposit with the MSEB for supply of meterial with 5% departmental charges only. When the deposits were withdrawn by the society, the departmental charges were increased to 15%.

Manufacture of poles

3.69 The Sircilla society has a PCC pole casting yard and has also set up a small workshop. This has helped the society to keep down the cost of poles. REC has advised all the societies that part of the special fund created from out of interest remission granted by the Corporation, could be utilised for setting up of a workshop for manufacture of equipment and material.

Accounts

3.70 REC had set up a small Committee to suggest measures for streamlining the accounting system in the cooperatives. The Report of this Committee has been forwarded to all cooperatives. Barring Hukeri society, maintenance of accounts in other societies needs considerable improvement. In one society, the arrears of completion of job-charts are considerable. In another, there are large unreconciled amounts in the stores accounts. Yet in another society, there is practically no superior check on the preparation of consumers' power bills.

Member education and member service

3.71 Effective implementation of programmes of member education and member service would be to the mutual advantage of the members and the societies. Not much, however, has been done in this direction. REC had set up an Informal Committee to suggest measures for better member involvement and efficient member-service. This Informal Committee has submitted its Report, a copy of which is at Annexure XII. That Committee recommended various measures for intensive member involvement in the working of rural electric cooperatives with a view to improving their overall efficiency, adoption of safety measures, minimising line losses, continuous expansion of load growth and diversification of the pattern of power use, and projecting the image of the rural electric cooperative as an effective public utility service organisation responsive to the needs of the members.

3.72 The Vaikunth Mehta Institute, in its Report on Mula Pravara, has observed : "It has been brought out that a large number of non-users of electricity could not take electricity because of their inability to make the initial investment. If these non-users

could be helped with a loan for making the initial investment to get a connection, many of these non-consumers could be attracted to the society." To improve the load growth in societies and also to orient their activities to specially help weaker sections, REC has advised the societies that part of the amount in the special fund could be utilised for giving loans to members upto Rs. 250 each for electrifying their houses. The members are expected to repay the loan within one year; but Harijans may be permitted to repay the loan within a period of three years.

3.73 At present, there is no arrangement in any of the societies for supplying electrical equipments or for their servicing. Recognising the importance of this service in rural areas, REC has advised the societies that part of the special fund created in the societies might be utilised not only for giving loans to members for electrifying their homes, but also for opening stores and workshops for supplying electrical equipments and servicing them. The Hukeri society has drawn up a proposal for opening of a store and a workshop.

Training

3.74 As we mentioned earlier, the first batch of General Managers and Project Engineers of all the five cooperatives were trained in America. The first batch is now being gradually replaced by a new set of officers who have had no special training. No training programme has yet been evolved for the personnel now being appointed to the key posts in these cooperatives. The second line of officers in the cooperatives would also need some special training. Officers of REC and NRECA specialists have, in recent months, been organising training courses in each of these cooperatives for training of middle level and junior personnel in safety measures, use of improved tools, meter reading, detection of theft etc.

Supervision and audit

3.75 It may be recalled that the project reports for all the five pilot rural electric cooperatives, which were considered by REC for sanction of loan, were prepared by the societies with the active assistance of SEBs. SEBs were thus closely associated with these cooperative projects. But there is no systematic arrangement at the State level for providing constructive supervision over these cooperatives. The officers of the Corporation's Technical and Finance Divisions have been periodically visiting these societies to

provide assistance and guidance to them. REC has also impressed on the Registrars of Corporative Societies to introduce a system of concurrent audit in these societies. The Corporation has also conducted a short duration course for accountants and auditors of rural electric cooperatives at Hyderabad in February, 1972. But audit of some of these cooperatives has been in heavy arrears and the need for prompt and continuous audit of accounts of these societies with large financial outlay, cannot be over-emphasised.

VI

Capital Structure

Capital outlay

3.76 To meet its block capital requirements for investment on acquiring or building a net-work of distribution system a rural electric cooperative has to muster long term resources. The normal sources of long term finance for cooperatives are : share capital from members; government contribution to share capital; long term deposits of members; and long term loans from financing institutions. A significant feature of these pilot cooperatives is that REC is financing 100% of the block capital requirements of these cooperatives including payment for the value of assets taken over from SEBs. The total estimated capital outlay of the schemes, the loans sanctioned by REC and the amounts to be given to SEBs for the assets transferred by them to the cooperatives, according to the project reports, are as follows :

TABLE 13

(Rs. in lakhs)

	Total outlay	Loan sanctioned by REC	Amount to be given to SEB	Value of new construction	Amount drawn from REC upto 31.3.72
1. Sircilla	295.94	295.94	49	246.94	164
2. Hukeri	173.40	173.40	48	125.40	72
3. Lucknow	242.65	242.65	60	182.65	89
4. Kodinar	183.12	183.12	22.80	160.32	55
5. Mula-Pravara	385.60	385.60	140	245.60	213
Total	1280.71	1280.71	319.80	960.91	593*

*Includes a pre-construction loan of Rs. 1 lakh sanctioned by the REC to each society and drawn by them.

3.77 The amounts to be given to SEBs have increased substantially in Mula Pravara and Lucknow societies. In Mula Pravara, the latest estimate of the value of SEB assets transferred to the cooperative exceeds Rs. 200 lakhs against Rs. 140 lakhs assumed in the project report. In Lucknow, the estimate is Rs. 78.64 lakhs as against Rs. 60 lakhs assumed in the project report. The Mula Pravara and the Lucknow societies are already revising their project estimates upwards in view of the larger amounts to be paid to SEBs as also the higher cost of new construction The Mula Pravara society needs also to make substantial improvements to the existing system it inherited from SEB. The unit cost of various items of works as envisaged in the project reports and as obtaining in the societies, is given in statement No. VI. There is a general escalation in the cost of construction material and labour. All the cooperatives barring perhaps Sircilla, may have to invest more than what was estimated in their project reports. One of the factors responsible for the unit cost being less than the project estimates in Sircilla, is the voluntary labour contributed by members. The Sircilla society has also its own pole manufacturing unit, which has helped the society to reduce the cost on this major item.

Long term resources and their utilisation

3.78 The total resources of the societies and their utilisation as on the 31st March, 1972 are given in statements III and IV. The share capital of the societies, borrowings from REC, service charges and security deposits collected from consumers, and the total investment of the societies as on the 31st March, 1972 are as follows :

TABLE 14

(Rs. in lakhs)

	Share capital	Borrowings from REC	Security deposits and service connection charges	Total	Total block investment
1. Sircilla	4.17	164.05	6.27	174.49	174.17
2. Hukeri	2.49	71.40	3.63	77.52	74.74
3. Kodinar	4.41	54.78	0.90	60.90	57.83
4. Mula-Pravara	1.55	213.00	5.40	219.95	199.72
5. Lucknow	1.25	89 48	5.18	95 91	110.25*

*Pending drawal of funds from REC, the society had utilised part of the amount of energy charges to be paid to SEB, for construction work.

Debt-equity ratio

3.79 The following figures indicate the share capital collected by the societies from their members, share capital contributed by the State Government, and the total loans sanctioned by REC :

TABLE 15

(Rs. in lakhs)

	Share capital collected			Loan sanctioned by REC
	Members	State Govt.	Total	
1. Sircilla	4.17	Nil	4.17	295.94
2. Hukeri	0.79	1.70	2.49	173.40
3. Kodinar	2.41	2.00	4.41	183.12
4. Mula Pravara	1.55	Nil	1.55	385.60
5. Lucknow	1.25	Nil	1.25	242.65
	10.17	3.70	13 87	1280.71

3.80 The total share capital of the society is only Rs. 13.87 lakhs, whereas REC has sanctioned a loan of Rs. 1280.71 lakhs. There is thus no corelation between the share capital base of the societies and the loans sanctioned by the financing institution. Absence of a proper debt-equity ratio tends—as it has happened in these societies—to distort the financial results of the working of the societies. Even when they do not earn profit in the initial years, the societies have to set apart funds towards interest on the entire capital, and this interest liability builds up over the initial years rendering it difficult for the cooperatives to present to their members, for a long time to come, a favourable balance-sheet. If a society has an adequate share capital base, the interest liability would be less and there could be a reasonable chance for a society to present to its members an encouraging picture of its financial results and thus create the member's confidence in it.

Share capital from members

3 81 The Sircilla society has collected a share capital of Rs. 4.17 lakhs from its members. Compared to its size, a sum of Rs. 2.41 lakhs of share capital collected from its members by the Kodinar society is not very unsatisfactory. Both these societies are linking the share holding of members to the type of service connections given to them. Besides, in the case of Sircilla society, the work of electrification of a village is taken up by the cooperative only after the prospective members in the village have deposited the requisite share capital in the society.

Contribution from Government and SEB.

3.82 State participation in the share capital of the cooperatives is a recognised principle. The Mysore Government have contributed Rs. 1.70 lakhs to the share capital of the Hukeri society and the Gujarat Government have contributed Rs. 2 lakhs to the Kodinar society. At the instance of REC, the Maharashtra Government has since contributed Rs 5 lakhs to the share capital of the Mula Pravara society. In U.P., SEB has since contributed a sum of Rs. 1 lakh to the share capital of the Lucknow society.

Special Fund

3.83 REC has agreed to waive interest charges on its loan for five years and the societies are expected to fund them and to invest the amount separately. The amounts to the credit of this fund could be utilised with the prior approval of REC. The amounts to the credit of the fund as on 31st March, 1972 are as follows :

(Rs. in lakhs)

Sircilla	6.57
Hukeri	3.96
Kodinar	1.76
Mula Pravara	8.07
Lucknow	3.18

It is estimated that, ultimately, the Hukeri and Kodinar societies may each accumulate special fund to the extent of Rs. 20 lakhs, Sircilla and Lucknow, Rs. 30 lakhs each, and Mula Pravara, Rs. 50 lakhs. Part of this fund could be utilised to meet the losses and part of it for construction programme, member-education and promotional measures for load growth A copy of the detailed instructions issued by REC regarding utilisation of the special fund is at Annexure XI. Considering that REC would be foregoing an interest of nearly Rs. 1.50 crores, it is indeed a commendable gesture on the part of the financing institution—perhaps without a precedent—to waive interest for the first five years to promote rural electric cooperatives.

Working Capital

3.84 No arrangement was envisaged in the project reports for working capital of these societies. The security deposits of consumers which normally amount to about two months' energy charges, should generally provide adequate working capital for the cooperatives. But Lucknow and Mula Pravara societies experienced considerable difficulty for their working capital. In the case of Mula Pravara society, at the instance of REC, the State Government have since contributed Rs. 5 lakhs to the share capital of the society to enable it to have liquid funds for working capital.

VII

Tariff Structure

Consumer Tariff

3.85 The rates at which a cooperative buys and sells power are crucial to its financial viability. The tariff charged by the individual cooperative to the consumer is practically the same as that charged by the corresponding SEB. The tariff charged

by the individual cooperatives to the consumers is given at Annexure XVI. It is only in the case of Mula Pravara society that the tariff to the agricultural consumers is more than that obtaining in the corresponding SEB area. The annual minimum charges levied by the Maharashtra SEB is Rs. 40 per HP for agricultural connection whereas the society is charging Rs. 6 per month per HP. The higher rate charged by the cooperative has already led to consumer dissatisfaction with the society. It is understood that the Maharashtra Government are providing subsidy to the SEB at the rate of Rs. 26 per HP while a similar subsidy is denied to the cooperative, thus placing the cooperative at a disadvantage *vis-a-vis* the SEB.

3 86 Another feature noticed in the Mula Pravara society is that the society is billing agricultural consumers monthly whereas the Maharashtra State Electricity Board is collecting energy charges on half-yearly basis. This has also resulted in consumer dissatisfaction with the society. The experience of this society emphasises that the consumers in a cooperative should not be placed at a disadvantage as compared to those in the respective SEB areas.

3 87 We observed in the Lucknow society that there is a preferential tariff for HT industry in the initial years. As in the case of SEB, the cooperative is also adopting a sliding scale of tariff for industrial consumers with 15% rebate for the first 3 years. The rates are as low as 6.7 paise per unit after a particular level while the society has to pay a uniform rate of 10 paise to the SEB. If any industry works beyond two shifts, the society will begin to lose heavily. Fortunately, the HT loads in the society are such that the society is realising 13.6 paise per unit on HT loads also.

Tariff for purchase of bulk power

3.88 The existing cooperatives have been organised with negotiated rates with the State Electricity Boards for supply of bulk power. To three of these cooperatives, namely, Lucknow, Sircilla and Mula Pravara, SEBs are supplying energy at the rates assumed in the projects reports. On the basis of two part tariff, the other two cooperatives are paying for energy on average rate higher than

the rate assumed in the project reports. The details are as follows :

TABLE 16

(Paise per unit)

	Sircilla	Hukeri	Kodinar	Mula Pravara	Luck-now
1. Rate of supply of power by SEB to the co-operative assumed in the project report.	8	6.9	10	9	10
2. The actual rate at which the co-operative purchased power from SEB.	8	7.4	13.4	9	10
3. Realisation of the society from consumers per unit of energy bought from the SEB.	12.6	14	15.07	9.02	15.2
4. Margin available to the cooperative.	4.6	6.6	1.67	0.02	5.2

It may be observed from the above that the Kodinar society is paying a rate substantially higher than the rate assumed in the project report, while in the case of Hukeri, the rate is marginally higher.

3.89 The margin available to the cooperative between the purchase rate and the rate of realisation from the consumer is crucial to its financial viability. Table 16 reveals that the cooperatives are operating on slender margins. The margins have been abridged particularly because of heavy line losses. The Mula Pravara has a margin of 0 02 paise per every unit bought from the SEB; Kodinar society, 1.67 paise; Sircilla 4 6 paise; and Hukeri, 6.6 paise. This margin has to cover interest charges, depreciation,

operation and maintenance expenses of the cooperatives. A broad indication of the margins required for rural distribution could be had from the following extract of the Annual Report of the Andhra Pradesh SEB for the year 1970-71 :

> "The Board at present is charging the agricultural consumers at 12 paise per unit for the first 600 units per HP and thereafter at 8 paise per unit. An analysis of the cost of supply of power by the Board for delivering one L.T. unit at the consumers point reveals that the cost per unit to the Board is more than double the cost at which supply is at present made to agricultural consumers. The cost of delivering one L.T. unit at the consumers point for the last 4 years is given below :

Year	Cost per unit in paise
1967-68	28.3
1968-69	24.7
1969-70	25.7
1970-71	27.6

3.90 REC is financing State Electricity Boards for implementing rural electrification schemes drawn up, as in the case of cooperatives, on a project basis. It would be relevant to examine the 11 KV bus cost the SEBs assume for their own schemes financed by REC and the rate at which they actually supply power to cooperatives :

(Paise per unit)

	Sircilla	Hukeri	Kodinar	Mula Pravara	Lucknow
1. Rate of supply of power to the cooperatives.	8	7.4	13.4	9	10
2. Rate assumed by the corresponding SEB for its own RE schemes.	9.59	4	9.52	6·36	11.30

It may be observed from the above table that the Andhra Pradesh and the U.P. SEBs are supplying electricity to the cooperatives at a rate lower than the rates assumed for their own rural electrification schemes. Even so, these two cooperatives incurred losses which reflects the inherent nature of the economics of rural electrification. The Maharashtra, the Gujarat and the Mysore SEBs are charging to the cooperatives at 11 KV bus, a rate more than the rate assumed for their own schemes.

3.91 The Kodinar society has already suffered a loss of Rs. 4.70 lakhs as on 31.3.1972. The cost of power to the society has further increased to 14 paise per unit for the period April to September, 1972. The society is sustaining loss at the rate of Rs. 50,000 per month. At this rate, the cumulative loss might reach Rs. 10 lakhs by March, 1973. The Mula Pravara society has accumulated a loss of Rs. 18.91 lakhs on 31st March, 1972. Even though the society has effected considerable savings in line losses this year, it is likely to accumulate another Rs. 10 lakhs loss by 1972-73. It is only the Hukeri society which has shown some marginal profit. The reasons for this are :

(a) As indicated in Table 16, the society has a margin of 6.6 paise per unit, which is the highest amongst all the cooperatives.

(b) Further, this society has confined itself to intensification of electrification around the 11 KV lines inherited from the SEB. The cost per Km of the inherited system is around Rs. 10,000 whereas the cost of new construction works out to Rs. 13,000 to Rs. 14,000 per Km. When the society goes in for new construction, the small margin of profit it has now is likely to yield place to deficit.

3.92 On the basis of discussions we had with the respresentatives of the State Governments on this vital issue, REC has already taken up with the Mysore, the Maharashtra and the Gujarat SEBs the question of reducing the tariff to the cooperatives to the level assumed by SEBs for their own rural electrification schemes. REC has informed these Boards that it would not be appropriaite for the Corporation to accept a rate for the rural electrification schemes of the SEBs which is below the rate charged to the cooperatives.

We are of the firm view that unless cooperatives are charged appropriate economic tariff for purchase of bulk power, their financial viability will be seriously undermined. We examine the approach to this crucial problem of tariff in the succeeding chapter.

VIII

Financial Results—In Retrospect & Prospect

In Retrospect

3.93 We have, in the preceding paragraphs, examined various aspects of the functioning of pilot rural electric cooperatives. The financial results of the working of a rural electric cooperative reflect, ultimately, the efficiency of its management, bring to surface the inherent problems and point to the need for reconsideration of the basic assumptions underlying project formulation.

3 94 Statement No. IX gives details of the financial results of the working of these societies for the period ended 31st March, 1972. A summary of the financial results of these societies for the year 1971-72 is as follows :

(Rs. in lakhs)

	Sircilla (71-72)	Hukeri (71-72)	Kodinar (7/71 to 3/72)	Mula Pravara (71-72)	Lucknow (71-72)
Expenditure					
1. Cost of power	8.70	5.85	6.08	51.55	14.11
2. O &M	2.63	1.92	1.80	7.45	3.66
3. Depreciation	2.89	1.44	0.84	7.62	2.53
5. Interest	2.29	2.02	1.25	7.69	2.29
5. Reserves	—	0.27	0.16	0.56	—
6. Profit for 1971-72	—	0.90	—	—	—
Total	16.51	12.40	10.13	74.87	22.59
Receipts					
1. Sale of power	13.55	11.62	6.93	51.16	21.55.
2. Misc. revenue	2.53	0 78	0.47	5.50	0 91
3. Loss for 71-72	0.43	—	2.73	18.21	1.06
Total	16.51	12.40	10.13	74.87	23.52
Profit or loss as on 31.3.72	—1.07	+0.90	—4.60	—18.91	—0.13

3.95 In terms of their project reports, all the cooperatives excepting Hukeri were to run in profit in the first year. Only Hukeri society was in profit in the first year upto 31st March, 1972. The major factors that contributed to the losses sustained by the societies, as indicated earlier, are inadequate load growth and energy sales, line losses which far exceeded the assumption of 10% made in the project report, inadequate margins between consumers' tariff and the tariff for bulk power purchased from SEBs, and inadequacy of management.

In prospect

3.96 Our terms of reference requires to evaluate the problems as also the promise of rural electric cooperatives. It is relevant in this context to consider what the shape of the financial viability of these societies would be in the next 10 years or so. The various social and other considerations underlying the cooperative form of organisation depend, for their achievement, on the financial viability of the organisation.

3.97 In terms of the project reports, all the cooperatives are expected to earn profits and obtain a net return of 2.27% to 5.6% on their total investment after providing for interest, depreciation and operational expenses. The net returns envisaged in the project reports are as follows :

TABLE 17

Percentage of net return at the end of

	5th year	10th year
1. Sircilla	2.25	5.13
2. Hukeri	2.30	5.06
3. Kodinar	5.68	5.33
4. Lucknow	2.57	5.65
5. Mula Pravara	2.27	3.50

3.98 The main business of a cooperative is to build a net-work of distribution system and buy and sell power. Sale of power is practically the only source of income for a society. The consumer tariff being pre-determined, the quantum of energy sale decides the

revenue of the society and the energy sale is dependent on the density of load and consumption of energy per KW of connected load. The major items of expenditure are : cost of power; interest; depreciation; and operation and maintenance expenses. Hundred per cent of the capital cost of the existing five cooperatives is to be borrowed by them as loan from REC. The interest liability is therefore directly related to the investment on the system. Depreciation and O & M expenses may conform to the project estimates without substantial variation. Given a fixed tariff for purchase of power, line losses decide the cost of power. In other words, given the tariff structure, the financial viability of a rural electric cooperative is a function of four factors : capital cost; density of load; intensity of utilisation of load; and line losses.

Forecast of energy sales

3.99 Excepting in the case of Mula Pravara, the estimates made in the project reports regarding energy sales appears to be slightly on the high side, as is evident from the following table :

TABLE No. 18

	Sircilla		Kodinar	
	A	B	A	B
1. Connected load/Km	10.6	21	17	18.3
2. Annual Sales Lakh KWH	77.72	404.10	46 30	438.904
3. Annual Sales/Km of HT & LT lines (KWH)	5227	16595	16303	30376
4. Annual sales per KW of connected load (KWH)	554	788	959	1656

Mula Pravara		Hukeri		Lucknow	
A	B	A	B	A	B
18	15 9	12.9	13 5	12 6	14
283.56	635.30	53.02	209	104 51	559,912
14235	15155	10335	14749	10932	24655
790	956	801	1091	867	1760

A : Actuals as on 31.3.72 or for the year 1971-72.

B : Project estimates at the end of the 5th year.

It may be observed from the above table that the density of load in Sircilla is expected to be stepped up from 10.6 KWs per KM as on 31st March, 1972 to 21 KWs by the end of March 1976. Further, during the same period, the annual sale per KW of connected load is expected to be stepped up from 554 KWHs to 788 KWHs. In Kodinar, the annual sale per KM of HT and LT lines is expected to be stepped up from 16303 KWHs to 30376 KWHs in a period of 4 years. In Hukeri, the sale per KM of connected load is expected to be increased from 801 KWHs to 1091 KWHs in 4 years. In Lucknow, it is envisaged, the annual sale per KM of HT and LT lines will increase from 10932 KWHs to 24655 KWHs.

3.100 It may be useful to consider, in this context, the all-India trends in load growth and energy consumption. Statement No. XI summarises the all-India trends of over-all load growth in the country, category-wise load growth as also the pace of progress of rural electrification since 1966. It may be observed that the electricity industry in India has recorded phenomenal growth in recent years. The total length of lines had increased from 1.46 lakhs KMs in 1960-61 to 10.6 lakh KMs in 1970-71, the total connected load rose from 8.2 million KWs to 24.2 million KWs during the same period and the total consumption of electricity grew from 13952 million KWHs to 44530 million KWHs. Due to rapid extension of lines, the density of load has tended to decline. During the period 1960-61 to 1970-71, the average connected load per KM came down from 56 KWs to 23 KWs, consumption per KM decreased from 94911 KWHs to 41030 KWHs; but consumption per KW registered a small increase from 1696 KWHs per annum to 1837 KWHs. Although the agricultural consumption increased from a mere 832 million KWHs in 1960-61 to 4535 million KWHs in 1970-71, the annual consumption per KW of connected agricultural load registered a decline from 1007 KWHs to 846 KWHs. These trends point to the need for adopting a more cautious estimate of load growths in rural electric cooperatives for the purposes of their financial forecast for a period of 5—10 years.

3.101 On the basis of the trends indicated above, it might be expected that the Lucknow, Kodinar, Hukeri and Sircilla societies might reach 80% of the energy sales envisaged in their project reports. Sircilla society may find it difficult even to reach 80%.

The Mula-Pravara society, on the other hand, is likely to reach the target fixed and may also exceed it.

Repaying capacity

3.102 In the first instance, the financial viability of a society depending wholly on loan funds for its block investment, is to be judged by its capacity to repay the loans. An attempt has been made to analyse, on the basis of the project reports of the co-operatives, their potential to repay the annual instalments of principal and interest of loans taken from REC from out of the operating surplus for the corresponding year. The following assumptions have been made in calculating the repaying capacity of these cooperatives :

(a) Energy sales at the end of 6th and 10th years have been assumed at 80% of the estimates made in the project reports for all the cooperatives excepting Mula Pravara society, which might reach the targets envisaged.

(b) The line loss has been assumed at 25% as againist 10% in the project reports. It may be recalled that, for the country as a whole, the line loss for LT distribution including urban areas where the density of load is high, has been estimated at about 30.6% assuming that loss in HT distribution at 10%.

(c) The block investment is the same as that assumed in the project reports although there has been a general escalation in the cost of construction. Interest has been worked out on the balance of outstanding amount of principal.

(d) The O & M expenses have been assumed at 13% of the capital cost as adopted in the project reports although this is likely to increase to 5-6%.

(e) The rate for purchase of bulk power from the SEB has been assumed at the rates assumed in the project reports. For Hukeri, the project report envisages a rate of 6.9 paise per unit, whereas the actual rate is 7.4 paise per unit upto 31.3.1972. Similarly, for Kodinar the rate assumed in the project report is 10 paise, whereas the actual rate for 1971-72 is 13.4 paise.

3.103 On the basis of the above assumptions, the following table illustrates the surplus generated in the 6th and 10th years and its adequacy to service the loans :

Sixth year

(Rs. in lakhs)

	A	*B*	*C*	*D*	*E*
Sircilla	26.22	9.19	17.03	21.69	(—) 4.66
Hukeri	15.44	5.21	10.23	12.71	(—) 2.48
Kodinar	14.31	5.49	8.82	13.42	(—) 4.60
Mula Pravara	37.67	11.56	26.11	28.29	(—) 2.18
Lucknow	15.04	7.42	7.62	17.70	(—) 10.08

Tenth year

	A	*B*	*C*	*D*	*E*
Sircilla	31.61	10.24	21.37	21.94	(—) 0.57
Hukeri	18.10	5.27	12.83	11.86	(+) 0.97
Kodinar	14.31	5.49	8.82	12.45	(—) 3.63
Mula Pravara	41.04	11.56	29.48	26.23	(+) 3.25
Lucknow	16.80	7.79	9.01	16.88	(—) 7.87

A : Difference between sale of power and cost of energy.

B : O & M expenses (as in the Project Report).

C : Surplus (A—B).

D : Instalment of interest and principal.

E : Deficit or Surplus (C—D).

The above table suggests :

(i) The financial results of the working of all cooperatives in the 6th year may not yield any surplus.

(ii) The Hukeri society may have surplus in the 10th year. The figures for Hukeri have been computed on the basis of 6.9 paise per unit for purchase of bulk power from the SEB. The rate actually paid by the Society during 1971-72 was 7.4 paise per unit, and at this rate, the Society may not have adequate surplus even in the 10th year to match the instalment of interest and principal.

(iii) The Mula Pravara Society has already incurred losses to the extent of Rs. 18.91 lakhs upto 31.3.1972 and it is likely to accumulate a further loss of Rs. 10 lakhs during 1972-73 at the existing tariff rates. This cumulative loss would render its capacity to service the loans more difficult.

(iv) The figures for Lucknow show that the society may not be able to generate adequate surplus to meet the instalments of principal and interest even in the 10th year. Fortunately, because of upward revision of tariff to consumers in U.P., the society's realisation per unit has also increased by over 2 paise per unit than what was assumued in the project report. If there is no corresponding increase in the tariff for purchase of power, this society might be able to generate surplus in the 10th year to repay REC loan.

3.104 The above analysis does not, however, take into account the interest remission granted by REC for the first five years. In fact, practically all the societies might have to draw on the special fund to meet their commitments to REC from the 6th year onwards. The hope, in the long run, is that consumer tariff might go up without corresponding increase in the purchase tariff. But an immediate solution needs to be found to improve the financial viability of these societies. A re-alignment of tariff for purchase of bulk power from SEBs, suggests itself as the principal source of remedy in the existing situation. The basis on which such re-adjustment of tariff is to be made, is discussed in the next chapter.

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CHAPTER IV

FUTURE POLICY AND PROGRAMME

I

Rationale of Rural Electric Cooperatives

Motivation of Members

As already indicated, organisation of the five pilot rural electric cooperatives in India was influenced by the success of American rural electric cooperatives. These cooperatives helped to revolutionise agriculture and modernise the countryside in USA. The context in which the American rural electric cooperatives were conceived, however, needs to be clearly understood. Power companies operating in the Thirties were not willing to reach out to the countryside. The choice before the American farmer was : To obtain power for his farm and home through a mutual-aid cooperative or forego the economic and social advantages electric power confers. The American farmer made the obvious choice. The following extract graphically describes the role of rural electric cooperatives in America :

> "In 1935 less than one farmer in ten in the United States had electric lights in his home or electric power in his barn. The basic reason was that the power companies regarded rural business as unprofitable. They believed, and said so, that farmers never would be able to afford electricity. Studies conducted by the commercial utilities brought forth estimates that the average farmer would have to pay seventy-five cents per kilowatt hour for energy if the companies were to make their established rates of profit from serving him. Farm families were told that they would have to pay $ 200, $ 500, sometimes $ 2,000 to the power companies just to get a line built to connect their farm.

The point was that the commercial power companies were in 1935—and still are—in business to make a profit, as good a profit as possible, out of each customer served.

Had no other economic motive been called into action, America's countryside would probably still be using candle and lantern light. The production miracles performed by United States farmers during and after World War II would have been quite impossible. American agriculture would remain a backward industry instead of the most progressive one in the entire nation. A multi-million-dollar rural market for electric appliances would not exist. Rural living would still be relatively primitive and difficult compared to urban living. Electric power rates would be twice what they are now in rural and suburban areas."*

4.2 The electricity industry in India is differently organised. State Electricity Boards have been set up in each State in the public sector for the coordinated development of generation, supply and distribution of electricity. In rural areas, the distribution of electricity is being extended entirely by these public sector organisations. The statute under which the SEBs are established, requires them to pay special attention to backward areas and it also enjoins on them that they should not 'as far as practicable' carry on their operations at a loss. There is thus no profit-motivated agency in the field of extension of electricity to rural areas, which the cooperatives in India need to replace to the advantage of the farmers and other rural consumers.

4.3 A cooperative is essentially an economic organisation. Its utility and success primarily depends upon its ability to confer economic benefits. In other words, a strong economic motivation of the members makes for the success of a cooperative and constitutes a major rationale for its organisation. It is this basic economic motivation that underlies the success of rural electric cooperatives in America. The American cooperatives have progressively brought down the cost of power to the farmer from

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*"American Cooperatives" by Jerry Voorhis.

9 cents in 1935 to 3.92 cents in 1948, and 2.02 cents in 1968. The situation obtaining in India is entirely different. It is well recognised that tariff for agriculture in India is lower than the tariff for other purposes and that it does not often cover the costs involved. In this context, a cooperative in India cannot hope to provide immediately services to its members in rural areas at a cost less than that charged by the corresponding SEB. A rural electric cooperative in India has, therefore, no immediate perceptible economic incentive to offer to its members.

4.4 Although, at this stage, cooperatives may not be able to confer direct economic benefits on their members, they are in a position to offer indirect benefits. Being a local organisation of consumers, its policies and procedures can be flexible to meet the requirements of local situations and consumers. As we noted in the preceding Chapter, a distinct feature of the functoning of existing cooperatives is that their comparatively better performance in giving new connections and attending to complaints from consumers has created a climate in which the members and other consumers expect them to render prompt and efficient services. This aspect of better response to consumer needs, which is of vital importance in the administration of a public utility, provides a motivation for individual consumers in rural areas to organise themselves into cooperatives.

Broader Considerations Underlying Rural Electric Cooperatives

4.5 There are other angles to the consideration of the rationale of rural electric cooperatives. These are :

(a) acceleration of the pace of implementation of rural electrification programmes;

(b) decentralisation of electricity distribution system in rural areas;

(c) functional specialisation for rural distribution; and

(d) provision of a focal point for the economic development of the area.

Acceleration of the Pace of Rural Electrification

4.6 The electricity distribution system in the country is predominantly in the public sector. During 1970-71, the total energy sold to consumers was 44513 million KWH; of this 77.6% was distributed by the public sector and 22.4% by the private sector. The accepted policy is to replace, as early as possible, the private sector by the public sector agency. This would mean that, practically, the SEB would be the sole agency for distribution of electricity in the country. The experience of the existing cooperatives is that they could supplement the efforts of the State Electricity Boards in implementing the programme of rural electrification. The percentage of villages electrified in the country is expected to be only about 26% by the end of the 4th Plan. Only three States, namely, Haryana, Tamil Nadu and Kerala are likely to electrify all the villages by the end of this Plan. According to the 'Decade Plan' of the Ministry of Irrigation and Power, by the end of 1980-81, 3.4 lakh villages or about 60% of the total number of villages in the country are required to be electrified. By the end of the 4th Plan, about 2.5 million pumpsets would have been energised, and this figure is expected to be raised to 6.5 million by the end of 1980-81. In a programme of this magnitude, there is considerable scope for developing cooperatives to supplement the efforts of SEBs for accelerating the pace of rural electrification.

Decentralisation of Distribution System

4.7 In a public utility, a centralised authority like a SEB, far removed from the distribution centres, may tend to be rigid and may not be able to enlist local participation or be responsive to the local needs or to associate itself actively with local development programmes. The objective of a rural electric cooperative, as pointed out in the Forth Plan Document, includes *inter-alia* encouragement of the active participation of the people by giving them some degree of control over electric supply. As a local organisation covering a compact area, a cooperative will be better suited to meet the special requirements of rural distribution for better consumer service, consumer participation, load promotion and self-policing of the system. The following extract from the Report of the Study Group on Rural Electrification, constituted

by the Power Economy Committee (1971), is relevant in this context :

> "As a matter of fact, electrification of each village is so much involved and the administrative and local problems could be so numerous though in a small unit that unless the people of the villages give their full cooperation, it might be a very time-taking task for the Government to spread rural electrification as a viable and efficient unit in the far and widely scattered villages of the country. For this purpose and in the existing constitutional set-up of the country, which has democratic socialism as its objective, the Committee felt that the rural electric cooperatives should give a suitable solution to the problem of 'total' electrification of the country in an efficient and economic manner"

Functional Specialisation

4.8 It is beyond the scope of our terms of reference to consider the structural pattern for distribution of electricity in rural areas. However, the massive programme of power development in the country might, in the long run, necessitate changes in the organisational pattern for distribution of electricity. The work of generation, transmission as also distribution of electricity might, from the point of view of technology as well as overall administration, become too unwieldy for SEBs in the context of a large scale programme of power development. The functions of generation and transmission may have to be separated from distribution and different organisations entrusted with these two sets of functions. For example, in England, there is the Central Electricity Generating Board which is responsible for generation and bulk supply of electricity. It has "to plan the provision of new generating stations and transmitting capacity, which includes research into new or better ways of doing it." There are 12 Area Boards in England which "buy their supplies of electricity in bulk from the Generating Board and are responsible for selling electricity to the consumers in their area; they also may—and in fact they all do—act as retailers of electrical appliances....."

4 9 Efficient and economic distribution of power poses different problems for different categories of consumers and areas. For example, the problem of distribution of power in metropolitan areas differs from that of rural areas. Different technologies and procedures to suit the requirements of different distribution systems may, therefore, have to be evolved, technical personnel specially trained, and different administrative structures like Metropolitan Boards, Area Boards, etc., may have to be thought of in the long run to impart efficiency and economy to the distribution systems. In this context, cooperatives may be seen as fulfilling the role of specialised agencies for distribution of electricity in rural areas.

Focal Point for Area Development

4.10 In rural areas, electrification can serve as the starting point of economic growth. This implies that the programme of rural electrification should converge with other promotional activities directed to the economic development of the whole area. In other words, the approach to rural electrification should be project based in that the provision of electricity forms part of a wider programme of rural development. There is a growing recognition of the need to adopt integrated area development and project approach for quickening the pace of rural development. The rural electrification schemes financed by REC are all project based.

4.11 Implicit in the project approach is the need for close coordination of activities of various developmental agencies, financing institutions and other organisations in the area. A cooperative, as a local organisation, can be a focal point for forging such coordination between different agencies and can spearhead the effective implementation of the area development programmes. The experience of the existing cooperatives, particularly that of Lucknow Society, has demonstrated that a cooperative is better suited to bring about such coordination.

Window on Rural Electrification

4.12 In a wider perspective, cooperatives can help to bring into sharp focus some of the basic problems of rural electrification. For example, the pilot cooperatives have already underlined the serious problems of line losses in rural distribution. In the overall operation of SEBs, some of these problems tend to be swept

under the rug. Furthermore, cooperatives can serve as useful agencies for introducing innovations—technical, managerial and financial—in the rural electric distribution system.

II

Economics of Rural Electric Cooperatives

Economics of Rural Electrification in General

4.13 Long distribution lines, sparse density of load, low tariff traditionally adopted for agriculture, and several other factors tend to render the business of rural electrification uneconomic. This has been repeatedly underlined by several expert committees. Recognising the nature of financial returns in rural electrification, the Committee on the Working of State Electricity Boards (1964) recommended :

> "The Government of India may explore the possibility of granting loans for rural electrification schemes which will be interest-free during the first five years."

The Energy Survey Committee considered that rural electrification should be viewed as a social service project. According to that Committee :

> "the test of the rate of further rural electrification beyond the stage that will be reached at the end of the Third Plan should, in our view, be the same sort of test that should be applied to a social service—health, education or welfare—generally how much of the service can the nation afford at its present income level ? The fact that the service has hitherto been provided at the expense of other electricity consumers should not obscure the need to ask this question. The nation will, we expect, be asking electricity consumers in any case to bear a significant part of the cost of extending the national system in the interest of others as well as themselves; thus there may be a case for rural electrification as similar to a social service in the more normal sense that it should be financed, partly at least by payment made from the general revenues of India or the States."

The Power Economy Committee (1971) recommended :

> "in order to enable the State Electricity Boards to take up the programme of rural electrification in a massive manner which generally results in financial losses, especially in the first few years, financial assistance in one form or the other should be provided to them."

4.14 The Andhra Pradesh SEB in its annual report for 1970-71 indicated that the cost of delivering one LT unit at the consumer point was 27.6 paise whereas the realisation from agricultural consumers was hardly 12 paise. The rate of return to the SEBs on investment in rural electrification is negative in practically all the SEBs. The return on investment on rural electrification schemes for some of the SEBs for the year 1970-71 was as follows :

1970-71

(Rs. in millions)

	State	Average capital base for RE assets	Surplus or deficit from RE	%age of Col. 3 to Col. 2
1.	Andhra Pradesh	446	(49)	(10.99)
2	Gujarat	245	7*	2.86
3	Haryana	336	(36)	(10.71)
4.	Mysore	347	(44)**	(12.68)
5.	Maharashtra	709	(54)***	(7.66)
6.	Tamil Nadu	630	(54)	(8.62)
7.	Uttar Pradesh	310	(27)	(8.71)

*Includes Government subsidy of Rs. 11 million for R.E.
**Includes Government subsidy of Rs. 1 million for R.E.
***Includes Government subsidy of Rs. 21 million for R.E.

4.15 A recent development in Andhra Pradesh is that, recognising the substantial losses involved in rural electrification, the Andhra Pradesh Government have agreed to subsidise the SEB.

Following is an extract from Andhra Pradesh Government's order ated the 23rd October, 1972 :

> "Andhra Pradesh State Electricity Board has represented to the Government that the cost of supply of energy to agriculture consumers is very high on account of low density of consumers and long length of transmission lines, etc. It has been represented that it costs the Andhra Pradesh SEB about 27 paise per unit at the consumer terminals, whereas the present tariff provides for 12 paise per unit only. After careful consideration, it has been decided to grant a subsidy on revenue account to Andhra Pradesh SEB to make up for the shortfall between the expenditure incurred in the supply at the rate of 27 paise per unit and actual revenue realised. The manner of adjustment of this revenue subsidy will be reviewed from year to year and determined."

4.16 The international experience of rural electrification also tends to show that rural electrification is generally not a paying proposition, at least in the initial years. John A. King Jr., an officer of the World Bank, in his article on "the World Bank, Project Lending and Cooperatives," has observed :

> "The Bank has not made loans for rural electrification as such, through cooperatives or otherwise, but some of its borrowers sell bulk power to cooperatives and many assist directly in rural electrification as their system expand. As these programmes have developed, the Bank has watched with sympathy but also with concern to make sure that the financial integrity of its borrowers is not endangered by having to provide the subsidy which is usually inherent in wide spread rural electrification."

The following extracts from the book on 'Power Development in India' points to the various financial incentives provided for rural electrification in some of the developed countries :

> "It is clear that in a very large number of cases, rural electrification may be uneconomic and an element of subsidy whether from the other consumers or from the State may be necessary. This has been recognised in all countries of the

world. In the United Kingdom, though there is no general system of State subsidies for rural electrification, the area boards are now constructing 11 Kv mains to the farms at their own expense even with insufficient returns and this actually constituted a disguised subsidy. In Italy, since 1919, a system of subsidy varying from 50 to 60 per cent according to the purpose of the supply, is in existence. In France, subsidies are granted partly in a lump sum and partly in the form of annual instalments which may account to 30 to 40 per cent of the total cost of extension and development works, on the condition that the cost per inhabitant does not exceed a certain ceiling figure. In Belgium, the subsidy is to the extent of 30% of the cost of the work In Switzerland, a system of subsidies exists from the beginning of the Second World War and is apportioned between the supply authorities, the federal government, the cantons or the communes and the subscribers. This is to the extent of 20 to 25% of the cost of overhead lines. In Canada, in order to bring the burden of the capital expenditure within reasonable economic limits, 50 per cent of the capital cost of the high voltage lines was subsidised directly from revenues by legislation. In Japan, the supply to rural areas is entirely in the hands of private companies controlled by the Rural Electrification Association in which the industry, the Government, the consumers and the licensees are represented. Any cost exceeding a certain figure per consumer required for by the supply company is shared by the consumers individually or collectively and the Government in the ratio of 2 1."*

4.17 The above description of the nature of business of rural electrification points to the need for building into the cooperative rural electrification schemes requisite safeguards which would provide the cooperatives a reasonable chance of success.

Approach Towards Concept of Viability of Rural Electric Coops

4.18 A cooperative is primarily an economic organisation. Economic viability is, therefore, of crucial importance to a

* "Power Development in India" by K. Venkataraman.

cooperative to enable it to fulfil the objectives economically and efficiently. We examine, in the first instance, the basis on which the viability of the existing cooperatives has been conceived and then consider the modifications that need to be introduced in the cooperatives to be set up in future.

4.19 The main objective of REC, according to its charter, is to finance rural electrification schemes. The principal clients of REC, naturally, are the SEBs. The Corporation's charter requires it also to promote and finance rural electric cooperatives. REC has so far sanctioned loans to five cooperatives amounting to Rs. 12.81 crores and the total loan sanctioned to SEBs for rural electrification schemes has, by January 1973, exceeded Rs. 200 crores. The broad principles governing the viability criteria for SEB schemes have been applied to cooperatives also with some modifications.

4.20 REC has laid down that, for a scheme to be eligible for financial assistance, it should satisfy the broad criterion of a net return of 3.5% on investment. While the criterion of net return of 3.5% is fixed, the period within which this should materialise is 10 years for an advanced area and 15 years for a backward area and 20 years for an underdeveloped hill area. The Corporation has not laid down any criterion of net return in the case of existing cooperatives to determine their viability. In sanctioning the loan, however, the Corporation has sought to satisfy itself that, at the end of the 5th year, each of these societies will have a net surplus, and the profitability will increase at the end of 10-15th year. The net return on total investment, envisaged in the project reports of the five cooperatives, has been indicated in the preceding chapter. The returns vary from 2.27% in Mula-Pravara at the end of 5th year to 5.58% in Kodinar, and 5.06% in Hukeri at the end of 10th year to 5.65% in Lucknow.

4.21 The Board of Directors of REC in their meeting held on the 26th August, 1971, reviewed the financing policy of the Corporation and suggested that, for furture cooperatives also, no specific rate of return will be prescribed, but norms for OB area schemes, as indicated in Annexure XIV, would be kept in view. This would mean that a cooperative should normally have a net return of 0.5% at the end of 5 years, 2% at the end of

10 years and 3½% at the end of 15 years. The new standard fixed by REC is indeed more liberal than the one assumed in the case of existing cooperatives.

4.22 There is a basic difference between the two categories of clients of REC—SEBs and cooperatives. For a SEB which is a multi-functional organisation, rural electrification is only a part of its activities. For a rural electric cooperative, distribution of electricity in rural areas virtually constitutes its only function. For the country as a whole, agricultural consumption of electricity accounts for hardly 10% of the total consumption of electricity, whereas in the cooperatives, the agricultural consumption accounts for as high a percentage as 80% in some cases. It is also well recognised that the tariff for agricultural consumers does not generally cover the costs involved, and the gestation period for a rural electrification scheme to break even financially is quite long. From the other more paying loads, a SEB can make up the loss it incurs in rural distribution; but such facility is not available to a rural electric cooperative. The following table illustrates the extent to which some of the SEBs made up their losses in rural distribution during 1970-71 :

1970-71

(Rs. in million)

State	Surplus from other than RE schemes	Surplus/ deficit from RE schemes	Overall position of surplus or deficit
1. Andhra Pradesh	31	(49)	(18)
2 Gujarat	21	+ 7*	28
3. Mysore	71	(44)**	27
4. Maharashtra	88	(54)***	34
5. Tamil Nadu	68	(54)	14
6. West Bengal	16	(11)	5

*includes Government subsidy of Rs. 11 million.

**includes Govt. subsidy of Rs. 1 million.

***includes Govt. subsidy of Rs. 21 million.

4.23 This basic difference will naturally be reflected in the capacity of the institutions to service the loans taken from REC. In the case of a cooperative, the new investment has to generate all the repaying capacity to enable it to service the loans. But a SEB has other resources to service the loans taken for rural electrification schemes. In fact, a SEB need not have to look into the net return on each scheme sanctioned by REC before paying the instalments of principal or interest on REC loans.

4.24 In the preceding chapter, we analysed the capacity of the existing cooperatives to service the loans. Our broad conclusion is that on the basis of existing tariff structure and the financial results of the working of the societies in the first year, many of these societies may find it difficult to service REC loans. We, therefore, suggest that the minimum norm of viability of a cooperative should, in the first instance, be deemed to be its capacity to service the loans and at least break even. The amount provided for depreciation may be taken into account for computing the repaying capacity of a society. After the initial period of five years, a society should be able to throw up surplus, build up some reserves and also be in a position to pay a reasonable dividend to its members on their share holding.

Aspects of Financial Viability

4.25 The financial viability of a rural electric cooperative is essentially a function of five important factors: capital cost; density and composition of load; intensity of utilisation of load; tariff structure and margins; and line losses. We deal with these aspects in detail in the succeeding paragraphs, and also formulate a model, taking into account these factors.

Model Economic Projections

4.26 To formulate guide lines for future cooperatives, we have attempted on the basis of the experience of existing cooperatives, the economics of a model rural electric cooperative. The following assumptions have been made in drawing up model economic projections :

(i) A cooperative may cover about 800 sq. kms extending to about 2 blocks or a taluk. A cooperative of this size will

have about 1200 kms of HT and LT lines at the rate of 1 5 kms per sq. km.

(The project report of Sircilla society envisages 1.2 kms. per sq. km., Hukeri, 1.47 kms. per sq. km., Lucknow 1.26 kms. per sq. km. and Mula Pravara 2.2 kms. per sq. km.).

(ii) The connected load per km. at the end of five years is assumed at 14 kws.

(The connected load per km. as on 31st March, 1972 was 10.6 kws. in Sircilla, 17 kws. in Kodinar and 18 kws. in Mula Pravara).

(iii) Consumption per kw. is assumed at 900 kwhs per annum. (The corresponding figure for Sircilla is now 554, for Hukeri, 801, for Mula Pravara 790, Lucknow, 867 and Kodinar, 959).

(iv) The line losses in the model we have assumed, are expected to be 20%. As the area of the cooperative will be compact and as there will be a separate administrative and technical machinery for this compact unit, it should be possible for a cooperative to make efforts to keep the line losses below 20% at the end of five years.

(The line losses in the existing cooperatives vary from 24.7% in Kodinar to 48.29% in Mula Pravara. The all-India figure for line losses in LT distribution is estimated at 30.6%, assuming the line losses in HT distribution at 10%.)

(v) The O & M expenditure will be about 6% of the capital cost.

(The information compiled by REC regarding O & M expenses for distribution system in the area of SEBs, shows that the percentage varies from 6.5% in Bihar to 7.3% in Andhra Pradesh, 9.9% in Gujarat, 11.8% in Haryana, 13.1% in Mysore and 20% in Orissa.)

(vi) The total cost per km. of the system will be about Rs. 13,000 including the cost of assets taken over from the SEBs at depreciated book value as also the amount required for reinforcing the installations taken over.

4.27 The size of operations and the capital cost of a society would be broadly as follows :—

(a)	Area	...	800 sq. kms.
(b)	Total H.T. & L.T. lines	...	1200 kms.
(c)	Connected Load per km.	...	14 kws.
(d)	Total connected load at the end of 5 years	...	16800 kws or 17000 kws
(e)	Annual consumption per kw.	...	900 kwhs.
(f)	Total estimated annual consumption	...	153 lakhs or 150 lakh units
(g)	Cost per km. of the system	...	Rs. 13,000
(h)	Total cost for 1200 kms.	...	Rs. 156 lakhs or Rs. 150 lakhs
(i)	Capital cost for delivering 1 kwh.	...	Re. 1

The capital investment approximates to Re. 1 for distributing 1 kwh at the end of the 5th year. This figure corresponds to the position obtaining in the existing societies if the escalation in capital cost and rate of load growth is taken into account.

4.28 We have attempted a financial forecast of the model society postulated above for the 6th year of its operation. The principal assumptions—which are explained later in this chapter—in making the financial projections are :

(a) The society will have a debt-equity ratio of 70 : 30.

(b) The society would repay the loan in 35 years with a moratorium for the first five years.

(c) The rate of interest on block capital loan will be 4% for the first 10 years.

(d) The average realisation will be 19 paise per unit sold and there will be, on an average, a margin of around 14 paise between sale of power per unit sold and cost of power.

4.29 The financial results of the 6th year of working of the society would be as follows ;

(a)	Total capital cost.	...	Rs. 150 lakhs
(b)	Loan.	...	Rs. 105 lakhs
(c)	Total No. of units sold.	...	150 lakh units
(d)	Line losses.	...	20%
(e)	Average realisation per unit sold.		19 Paise
(f)	Total realisation for 150 lakh units.	...	Rs. 28.50 lakhs
(g)	Total margin available at 14 paise per unit sold.	...	Rs. 21.00 lakhs
(h)	Accounting of margin of Rs. 21.00 lakhs :—		
	(i) Interest	...	Rs. 4.20 lakhs
	(ii) Amortisation of loan	...	Rs. 3.50 lakhs
	(iii) O & M expenses.	...	Rs. 9 lakhs
	(iv) Cost of line losses. (approx)	...	Rs. 1.90 lakhs
	(v) Surplus (before taxation) available for statutory reserves and dividend at about 3% on share holdings.	...	Rs. 2.40 lakhs
			Rs. 21.00 lakhs

The above financial forecast of the model society for the sixth year of its operations will enable the society not only to break even and service the loan, but also to have some surplus for allocation to reserves and for paying a dividend of about 3% on share holdings.

III

Capital Structure

Debt-equity Ratio

4.30 An adequate share capital base substantially reduces the interest liability. Further, in the initial years when the cooperative may not have adequate pofits, there is no accumulation of liability on account of interest on the equity portion of the capital. In the model postulated earlier, we have assumed the capital cost of the

project at Rs. 150 lakhs. If the entire amount were borrowed as loan, the incidence of interest charges at 4% would be Rs. 6 lakhs: if 70% of the capital cost were borrowed, the incidence would be Rs. 4.20 lakhs ; and if 60% of the capital cost were borrowed, the incidence of interest would be 3.60 lakhs. If the debt-equity ratio were 70 : 30, the savings to the society on interest would be Rs. 1.80 lakhs. If the debt-equity ratio were 60 : 40, savings on interest would be Rs. 2.40 lakhs. A larger equity would provide a better economic base for rural electric cooperative. However, considering the difficulties of cooperatives in mustering capital on their own, we suggest that for future cooperatives, the debt-equity ratio may be 70 : 30. The quantum of loans from REC may be upto 70% of the total investment. This would mean that a cooperative requiring an investment of Rs. 150 lakhs may borrow upto Rs. 105 lakhs from REC and raise further resources to the extent of Rs. 45 lakhs from members, the State Government and the State Electricity Board.

Share Capital

4.31 Collections from members may be by way of share capital as also contribution. The existing cooperatives, like the SEBs, collect security deposits from consumers. Normally, estimate of cost of two months' consumption of electricity is taken as security deposit from a consumer. The purpose of security deposit is to ensure realisation of power dues from the consumers. We would suggest that the societies may, instead of collecting security deposits, collect share capital. Share capital of a cooperative is essentially a risk capital which would cover not only overdues of members in respect of power bills, but also provide a margin to the creditors. In other words, share capital will have a wider coverage than security deposits. Further, cooperatives collect service connection charges from consumers for giving new connections. Such service connection charges generally account for about 3—5% of the cost of new investment. This may be taken as contribution of members to the reserve of a cooperative. To provide economic incentives to its members, a cooperative should attempt to reduce, as far as possible, the service connection charges to be levied on the consumers. A society could also collect additional share capital from its members. The share capital a member is required to contribute should be

related to the type of service provided to him e.g., agricultural service, domestic service etc. The total resources a society could muster from its members may thus be of the order of Rs. 10 lakhs.

4.32 The area which a society takes over from the SEB will have some assets of the Board. The Board will have to transfer the assets to the society. Based on the experience of the existing societies, it is assumed that assets to be transferred by a SEB to a cooperative will account for about 20—25% of the total capital cost of the project. The cost of assets to be taken over may be assumed at Rs. 30 lakhs. The present procedure is that the SEB is paid the full amount of the value of assets transferred to the cooperative and for this purpose, the depreciated book value of the assets is taken. Some of the SEBs have begun to contribute to the share capital of societies. At present, the entire responsibility for rural electrification vests in the SEBs. When a cooperative is organised, a part of this responsibility is taken over by it. It is, therefore, reasonable to expect that the SEB converts part of the value of assets transferred to a cooperative, as share capital in the society. We observed earlier that the SEB should be actively associated with a cooperative. This association is to be brought about through its participation in the share capital of the society as also in its management. We refer to the latter aspect in a subsequent paragraph. We recommend that 50% of the value of assets transferred by a SEB, subject to a maximum of 10% of the total capital cost of the project, may be converted as its share capital in the society. This would mean, in the model we have formulated, Rs. 15 lakhs per society. A part of the remaining amount may be set apart by the SEB for effecting improvements to the cooperative distribution system e.g., construction of more sub-stations etc.

4.33 The Gujarat and the Mysore Governments have contributed to the share capital of rural electric cooperatives in their respective States. We have suggested that the financial assistance and the needed relief to a cooperative should be shared primarily between the State Governments and the SEBs. State partnership in cooperatives is an accepted principle in the country. To promote rural electric cooperatives for various reasons mentioned earlier in this Chapter, to attract institutional funds from REC for financing the projects and to improve the economic viability of the cooperatives,

the State Governments may contribute about Rs. 20 lakhs towards the share capital of each cooperative. The society may have a programme of retiring Government share capital from the tenth year onwards. For this purpose, it may, from the beginning, collect additional share capital of about 50 paise per connection per month, which should enable the society to gradually retire the Government share capital from the 10th year onwards.

4.34 The arrangement we suggested above would mean that the capital cost of Rs. 150 lakhs of a cooperative might be met from the following sources :

	(Rs. in lakhs)
(a) Contribution from members	10
(b) State Government	20
(c) SEB	15
(d) Loan from REC on State Government guarantee	105
	150

We should like to add that no rigidity need be attached to the above formula. We envisage that, between the SEB and the State Government, they should contribute to the share capital of a society about one-fourth of the total cost of the project. No individual share need be strictly insisted upon. The amount to be contributed in cash by the State Government may be phased over a period of 2-3 years. Further, while the total assistance that will be provided by REC will be restricted to 70% of the capital cost, the amount to be released by REC in the initial years of a cooperative project, need not be strictly related to the resources raised by the society.

4.35 To enable the State Government to contribute to the share capital of cooperative credit institutions in the country, the Reserve Bank of India gives them long-term loans from the National Agricultural Credit (Long-Term Operations) Fund. On this analogy, for promoting rural electric cooperatives, REC should consider extending similar facility to the State Governments. The amount of assistance from REC to State Governments may be restricted to about 15% of the total cost of a cooperative project.

Share Capital In Existing Cooperatives

4.36 There is practically no debt-equity ratio in the existing co-operatives. REC has already sanctioned loans to these cooperatives to the extent of 100% of the capital requirements as envisaged in their project reports. Some of these cooperatives have begun to revise their project reports and the capital cost will be higher than envisaged in their project reports. When these societies come up to REC with their revised projects, it may be considered whether part of the additional loan funds required by them over and above the present commitment of REC could be met by the concerned State Governments as share capital contribution to the societies.

Terms and Conditions of REC Loan

4.37 The terms and conditions on which REC has sanctioned loans to the existing five pilot rural electric cooperatives and the terms and conditions laid down by the Corporation in its meeting held in August, 1971 for future cooperatives are as follows :

Item	Conditions for existing cooperatives	Conditions for future cooperatives laid down by REC
1	2	3
1. Quantum of loan	100% of total capital outlay	100% of total capital outlay
2. Period of the loan	35 years	30 years
3. Moratorium on principal	First five years	First five years
4. Rate of interest	4¼% for 1st 10 years	4¼% for 1st 10 years.
	5¼% for 5 years thereafter.	5¼% for 5 years thereafter.
	5¾% for 5 years thereafter.	5¾% for 5 years thereafter.
	6¼% for 15 years thereafter.	7¼% for 5 years thereafter.
		8¼% for 5 years
	With a rebate of ¼% throughout for punctual payment.	With a rebate of ¼% through out for punctual payment.

1	2	3
5. Interest remission.	REC will be willing to forego the interest for the first 5 years if the society agrees to credit an amount equivalent to the interest at 4% during these five years to a special fund to be created and administered by it in accordance with the rules to be framed with the approval of the Corporation.	

The difference between the terms and conditions applicable to the existing societies and those approved by the Board of REC for future cooperatives are : period of loan for the existing cooperatives is 35 years, whereas for future cooperatives it is 30 years and the rate of interest for future cooperatives has been increased from the 21st year onwards.

4.38 We have carefully examined the period of the loan for the future cooperatives. A longer period of loan reduces the annual amortisation amount and thus helps in improving the financial viability of a society. We would suggest that the period of REC loan may be 35 years, as at present, with a moratorium for the first five years. This would mean in the model we have formulated that a society has to repay the REC loan of Rs. 105 lakhs in 30 annual instalments of Rs. 3.5 lakhs each, beginning from the 6th year. If a society were to repay the loan in 30 years with a moratorium for the first five years, the annual instalment on principal from the 6th year would be Rs. 4.2 lakhs. The difference in the annual amortisation amount between 35 years loan and 30 years loan is Rs. 0.70 lakhs. This would mean approximately 0.5 paise per unit sold, assuming that the cooperative sells 150 lakh units at the end of the 5th year.

4.39 As regards interest charges, a suggestion has been made to us that as the norms of viability for a cooperative are based on OB schemes, the rate of interest charged for OB schemes may

be made applicable to cooperatives. We agree that no undue preference need be shown to cooperatives in the matter of interest rates. The average rate of interest to be paid by a cooperative during the entire period of repayment of REC loan may be more or less the same as for OB schemes of SEBs; but the interest rate structure may be so designed that, in the initial years, the interest rate charged to the cooperative is comparatively less and in the later years higher. The net interest rates for OB schemes are : for the first 10 years –5%; 11th-15th year—5.5%; 16th-20th year—7%; and 21st-25th year—8%. The average rate of interest for OB schemes from 6th year onwards (from the year the payment of annual instalment of principal begins) upto the end of the period of loan works out to about 5.75%. For future co-operatives, we would suggest the following interest rates for REC loans : for the first 10 years—4%; 11th to 25th year– 6%; 26th to 35th year –8%. The average interest rate from 6th year upto 35th year would work out to approximately 5.60%.

4.40 Inherently, rural electrification, in the initial period, is not an economic proposition irrespective of the agency undertaking it. Being a local level organisation, a cooperative could be expected to develop load quickly, focus attention on line losses and also effect economies in construction. Even so, a cooperative would need assistance in the initial years until it reaches a break even point. This assistance to be given to a cooperative may be shared principally between the State Government and the SEB and to some extent by REC which is required by its charter to promote rural electric cooperatives. REC has, in respect of existing cooperatives, agreed to waive interest charges for the first five years. This facility has indeed helped the cooperatives immensely. It provides not only a cover for losses in the initial years, but also enables the cooperatives to undertake promotional and extension work which, in the initial years, they may not be able to do from their own funds. We have considered to what extent this facility could be extended by REC to the cooperatives to be set up in future. A rural electric cooperative would need some cushion in the initial years to meet unforeseen losses. At the same time, such relief should not be a burden on the financing institution also. Considering various aspects, we suggest that REC might consider waiving interest charges for future cooperatives for

the first three years. This would mean that REC might have to forego interest to the extent of about Rs. 6–7 lakhs per society.

State Government Guarantee

4.41 REC is giving loans to these cooperatives on the guarantee of the State Governments. For the future cooperatives, we have suggested that REC loan should be available upto 70% of the total capital cost. The State Governments may be required not only to guarantee the loans sanctioned by REC, but also to give an undertaking that they would meet or make arrangement to meet the shortfall, if any, in the resources of a society to complete the project.

Working Capital

4.42 A society may need a working capital of about Rs. 6–8 lakhs for which it may make arrangements with a local cooperative bank or a commercial bank. These loans may be arranged on State Government's guarantee. Association of a local bank with the rural electric cooperatives will also ensure proper financial supervision over it. In the initial years, however, a cooperative may utilise part of the resources raised from members towards working capital and thus save on interest charges of 9% or so payable to banks.

IV

Tariff

4.43 The following table indicates the tariff assumed in the project reports drawn up in respect of pilot rural electric cooperatives, the rates adopted by the State Electricity Boards for their own projects presented to the Rural Electrification Corporation and the rates actually charged by the SEBs to the pilot rural electric cooperatives :

(In paise)

Name of the society	Rate of purchase of power from SEB as provided in the project report	Cost of power assumed by the SEB for its RE schemes	Actual rate charged by SEB
1. Sircilla	8	9.59	8
2. Hukeri	6.9	4.00	7.4
3. Kodinar	10	9.52	13.4
4. Mula Pravara	9	6.36	9
5. Lucknow	10	11.30	10

It will be seen from the above table that there has been no consistency in the approach that has governed the relationship between SEBs and pilot rural cooperatives in the matter of sale and purchase of electric power. In two cases, namely, Lucknow and Sircilla, the actual rate charged by SEBs from the cooperatives is identical with the rate as provided in the project report and is also lower than the cost of power assumed by the concerned SEB for its own schemes presented to REC. In one case, namely, Mula Pravara, while the actual rate charged by SEB is identical with that provided in the project report, the quantum of the rate charged is distinctly higher than the rate adopted by SEB for its own projects financed by REC. Finally, there are two remaining cases, namely, Hukeri and Kodinar, where the actual rate at which SEB is selling power to the concerned cooperative is distinctly higher than the rate adopted in the project report as well as the rate adopted by the concerned Electricity Board for its own projects presented to REC.

4.44 The above paragraph describes the position as it had obtained hitherto. However, we understand that certain decisions are being contemplated in the case of some of the cooperatives to modify the tariff. We understand that, in the case of Hukeri Cooperative, the SEB proposes to charge 5.5 paise per unit as against 7.4 paise being charged hitherto. Similarly, with regard to Mula Pravara Cooperative, the Electricity Board, it is reported, proposes to charge around 7 paise per unit. With regard to Kodinar, the matter is under discussion between REC, the Co-operative concerned and the SEB.

4.45 From what we have stated earlier, it is evident that a great deal of ad-hocism has characterised the decision-making process in regard to determination of the tariff between the SEBs and various pilot rural electric cooperatives. In a significant way, this factor has contributed to the financial results which are currently visible in respect of some of these cooperatives. We need hardly stress the importance of evolving a rational policy in this regard. Such a policy must be one which is fair and acceptable to the SEBs and, at the same time, gives to an efficient working rural electric cooperative a reasonable prospect of financial viability in the sense in which we have postulated earlier. As is self-evident, the most decisive factor determining the financial viability

of these cooperatives is the average margin between the purchase price and the sale price of power handled by these cooperatives. Since, in the matter of sale price, the rural electric cooperatives have hardly any discretion of their own and necessarily have to adopt the general tariff laid down by SEBs, an appropriate purchase tariff becomes a matter of continuing importance for the growth and development of these cooperatives.

4 46 The question of tariff between SEBs and the cooperatives can be looked at from various angles. One alternative would be to try to take a view as to the capacity of the cooperatives to afford to pay for power purchased by them. In making any such computation, it will be necessary to make projections in respect of at least seven variable factors mentioned below :

(i) Capital structure.

(ii) Connected load per K.M.

(iii) Line losses

(iv) O & M expenses

(v) Cost per K.M. of line.

(vi) Load factor.

(vii) Average realisation per unit.

Each of the above factors has a distinct impact on the financial viability of a cooperative. Until a society has gained some experience for about two or three years, it would be difficult to assess the combined effect of these various factors on the financial viability of a society and to determine, on that basis, the tariff for purchase of power.

4.47 Apart from the considerations mentioned above, it appears to us that the SEBs might, with some justification, argue that, in determining the tariff between them and the cooperatives, the SEBs cannot be deemed to be vitally concerned with what the capacity of an individual cooperative to pay for would be. On the other hand, the SEBs may like to sell power to the cooperatives at a rate which is equivalent to the cost of power to the SEBs at the 11 K.V. bus. We have examined this proposition in some detail. We find that, in the first instance, the cost of power to SEBs at the 11 K.V. bus differs very materially from State to State. Further more—and this is much move important—the cost

of power actually incurred by SEBs at the 11 K.V. bus does not, in fact, represent the ultimate income realised by SEBs from the electricity retailed by them in the rural areas. The net realisation is inevitably lower on account of various factors which impinge on rural distribution of electricity.

4.48 In the above conntext, it will be relevant to refer to the available data on the net return realised by SEBs from rural electrification. For the year 1970-71, the return to various SEBs was as follows :

1970-71

		No of units sold (Million Kwh)	Loss in RE (Rs. in million)	Per Unit/Paise			
				Realisation	O & M Depr. and Int.	Cost of energy per unit sold	Loss
1.	Andhra Pradesh	430	49	18.37	18.60	11.07	11.30
2.	Haryana	321	36	19.94	23.05	8.19	11.30
3.	Mysore	205	44	16.10	33.66	3.82	21.38
4.	Maharashtra	745	54	19.20	19.73	6.72	7.25
5.	Punjab	490	58	10.61	16.53	6 00	11.92
6.	Tamil Nadu	1635	54	17.68	13 52	7.45	3.29
7.	Madhya Pradesh	375	35	16.53	16.53	9.45	9.45
8.	Bihar	184	37	33.25	41.30	11.82	19.87
9.	Rajasthan	131	24	19.00	29.00	8.71	18.71
10.	Kerala	185	14	16.80	19.00	5.08	7.28

It will be observed from the above table that, generally speaking, the SEBs are losing heavily on rural electrification. The loss per unit would actually be more in as much as the cost of energy assumed in the above table is the cost per unit sold and computed on the following basis :

O & M expenses, depreciation and interest charges on generation and EHT.

Total No. of units sold in the State.

The above computation does not take into account the considerable line losses involved in LT distribution, particularly in rural distribution.

4.49 Elsewhere, we have made certain recommendations which have a bearing on the location of new rural electric cooperatives to be organised. In those recommendations, we have visualised that the area to be selected should be a promising one from the point of view of load growth and other relevant factors. It will, therefore, be obvious that whatever may be the financial returns to the SEBs on rural electrification from the State as a whole, their net realisation in the promising areas should be somewhat better than the average for the State as a whole. Even so, this net realisation will not, ordinarily be, *prima facie* equal to the cost of power to the SEBs at 11 K.V. bus.

4.50 Earlier we have stated that, any rational policy to be worked out for tariff between SEBs and the cooperatives must be one which is fair to the SEBs and which should ordinarily prove acceptable to them. We have discussed this matter in considerable detail with the various State Electricity Boards. We have come across a variety of views in this regard. Generally speaking, we have found that the representatives of the rural electric cooperatives and the representatives of the State Electricity Boards have tended to take somewhat diametrically different positions in this matter. It appears to us, therefore, that policy in this regard should steer clear of the two extreme alternatives, namely, equating the tariff with the cost of power to SEBs at 11 K.V. bus on the one hand and equating it with a notional ability of a given rural electric cooperative to pay for the power purchased by it.

4.51 We consider that it is necessary to evolve a formula for fixation of tariff which is mutually beneficial to the SEBs as well as the cooperatives. As far as the SEBs are concerned, the formula should satisfy the following norms :

(i) The tariff should be so worked out that it does not impose on the SEBs any losses over and above what they might have been incurring prior to the formation of the co-operatives. At the same time, the SEBs should not seek to derive any extra gain at the expense of the newly formed cooperative.

(ii) The State Electricity Boards should have the prospect of a gradual escalation in the incomes realised by them from the cooperatives in the coming years.

(iii) Within a reasonable period the tariff may get, by and large, equated to cost of power to the SEBs at 11 K.V. bus.

As far as the cooperatives are concerned, the formula should conform to the following norms :

(i) it should provide to the cooperatives a reasonable margin so that, given the normal degree of efficiency in operation, the cooperatives should be able to at least break even during the initial period.

(ii) The cooperative should be left with a clear incentive for improving the system by reducing the line losses and thereby building up its net income.

4.52 In the light of the considerations mentioned above, we suggest that, initially for a period of three years, the tariff between a rural electric cooperative and SEB may be determined on the basis of net realisation per unit to the SEB from retailing electricity in the area. We have suggested the above basis for the following reasons :

(a) in the initial years the society would be naturally concentrating more on construction work and the load growth would be comparatively slow;

(b) the net realisation to the SEB from the area would practically continue to be the same as that it was realising before handing over the area to the cooperative; and

(c) this would also enable the society to at least break even in the initial years.

The net realisation to SEB may be determined on the following basis :

(a) The gross value of the distribution plant etc. of the SEB in the area proposed to be transferred to a cooperative may be noted.

(b) The number of units of power metered out of the sub-station or sub-stations for the sale in the area may also be noted.

(c) The gross revenue from sale of power and other miscellaneous revenue collected from the consumers in the area may be ascertained.

(d) The following items of fixed costs and revenue expenditure as percentage of gross value of the plant may be deducted from the figure of gross revenue as indicated above to arrive at the net revenue from sale of power :—

(i) Interest @ 6%* per annum.

(ii) Depreciation @ 3% per annum.

(iii) O&M expenses @ 6%**.

(e) The net revenue accruing to the SEB as determined above, may be divided by the total number of units metered out to the area [vide item (b) above] to arrive at the per unit net average revenue accruing to the SEB from that area. This return should initially be fixed as the unit cost of power payable by a rural electric cooperative.

4.53 The cost of power fixed initially for a period of three years should be reviewed by a Committee consisting of the representatives of the society, the SEB, the State Government, the Registrar of Cooperative Societies, and REC with a view to suggesting suitable modification keeping in view the capital cost, trends in load growth, line losses and the financial viability of the society in the sense we indicated earlier. At the end of six years, another review may be made by the Committee referred to above to consider further modification in the rate of purchase of power keeping in mind the financial position of the society, its capacity to pay more and the provision for reserves as also for payment of reasonable dividend to the shareholders. Thereafter there may be a periodical review by the Committee mentioned above. once in five years. Another principle that should govern this periodical review of tariff is that, as soon as a society crosses the break even point, the tariff should be fixed nearer the cost to the SEB at 11 K.V. bus, taking into account the amount for allocation to reserves and for payment of dividends. The rates of power proposed by the Review Committee may be subject to approval by REC.

4.54 We recommend the above approach for determination of tariff structure between the SEBs and the cooperatives in respect of not only new cooperatives that might be

*This is the rate of interest chargeable to the SEB by REC for OA schemes.

**Although O&M expenses in SEBs are reported to vary from 5.3% to 20%, we have kept the figure only at 6%.

organised in future but also for the existing ones. It might be difficult to apply the formula retrospectively in respect of existing cooperatives, but we trust that it may be possible to make it applicable prospectively. We would, therefore, suggest that the first review we suggested after three years for the new cooperatives may be undertaken in respect of existing ones for being given effect to from the financial year 1973-74 on the basis of the working and the financial results of the societies for the year 1972-73.

Cooperatives, Not Mere Licensees

4.55 When we discussed the question of reduction of tariff to the existing cooperatives with the Chairmen of some of the SEBs, it was questioned whether, it was legally permissible for the SEBs to charge to a cooperative licensee a tariff less than that applicable to other licensees. Our considered view is that preferential treatment to cooperatives is permissible. Firstly, there are two SEBs which are already charging to their cooperatives a tariff less than their cost at 11 Kv bus. Secondly, Section 47 of the Electricity (Supply) Act, 1948 only lays down that "The Board shall not show undue preference to any licensee." There are practically no private licensees in the rural areas. The private licensees operate mainly in urban areas. As observed by Venkataraman Committee on State Electricity Boards :

> "A majority of these licensees are operating in the States of Maharashtra, Gujarat, Uttar Pradesh and West Bengal. Most of these licensees cater to concentrated urban loads and are able to earn a good return on their capital base even without inflating tariff rate. In extending power supply, they generally go by the strict principle of remunerative return and are reluctant to embark on intensive rural electrification schemes in the interest of national development, as rural electrification is not paying, judged by the commercial standards."

The Electricity (Supply) Act permits the private licensees to adjust their consumer tariff with a view to earning reasonable return which has been fixed at 1% more than the Bank rate. But the cooperatives charge the same rate as that charged by the SEBs. Thirdly, the SEBs can for the purpose of tariff, classify rural electric cooperatives as a separate category and this, we feel,

will not violate any of the provision of the Act. Fourthly, the question of preferential treatment to cooperatives under various Acts has been considered earlier by the courts. In the case of Orient Weaving Mills *versus* Union of India, it was held by the Supreme Court that exemption in favour of cooperative societies is consistent with the Directive Principles laid down in Article 43 of the Constitution. Finally, there are a number of instances where, even in the matter of tenders called by various Government institutions, some preference in rates is given to the cooperatives.

Government Subsidies

4.56 We came across cases where the State Governments have been providing subsidies to the SEBs in respect of rural electrification. Such subsidies should also be made applicable to the cooperatives; otherwise the cooperatives have to charge higher rates to their consumers and these consumers will be placed at a disadvantage *vis-a-vis* their counterparts in the SEB areas. The special status of cooperatives as an intergral part of the rural electrification programme—and not as mere licensees—should be recognised and the Government subsidies for rural electrification programmes should be available to cooperatives also.

V

Physical Features of Cooperative Project

Project Approach

4.57 Extension of electricity to a rural area opens the way for general development. Electrification also demands large investment. To tender electrification more economical, it is necessary that the full potential of development of the area is assessed and exploited. From a developmental point of view, it is imperative that the various developmental agencies, instead of making individual and isolated efforts, should pool their resources to concentrate on the integrated development of a given area. This approach not only quickens the pace of development but also imparts economy and efficiency to the process of development. Another major advantage

of such project approach is that it could attract institutional finance for various components of the developmental programme. There is, therefore, a growing emphasis in our planning process on integrated area development and project approach. A major rationale for a rural electric cooperative, we observed earlier, is that it is better suited for implementation of a project-based rural electrification scheme. Project approach should, therefore, be the basic feature of the rural electric cooperatives to be set up. It is necessary that at the stage of formulation of these projects, various developmental agencies and institutions in the area are closely associated so that the implementation of the project as a whole is rendered easy.

4.58 The main objective of a rural electric cooperative is to service agriculture and agro-based industries. Availability of groundwater resources, potential for agricultural development, prospects of agro-based industries and possibility of developing adequate and economic load, should be carefully assessed before organising a rural electric cooperative. In other words, location of cooperatives needs to be determined by the natural potential for load development. As the project approach envisages support from various institutional agencies, it should be ensured that the basic infra-structure for providing necessary facilities like credit etc., is available in the area.

Size of a Cooperative

4.59 The area covered by each of the existing cooperatives is indicated in Statement No. I. It varies from about 300 sq. kms. in Kodinar to 1880 sq. Kms. in Mula Pravara. The Sircilla and the Hukeri societies cover one taluk each ; the Kodinar society covers one complete taluk and part of two other taluks; the Mula Pravara society covers two whole taluks as also a few villages in two other taluks; the Lucknow society covers 6 development blocks in the district. The capital cost of the projects vary from Rs. 173.40 lakhs in Hukeri to Rs 385.60 lakhs in Mula Pravara.

4.60 Various considerations that enter into the determination of the size of a cooperative are: technical feasibility, financial viability, administrative convenience and workload for the chief executives

and the core minimum staff and convenience to members to participate in the affairs of the society. A suggestion has been made to us that the area of a cooperative may be co-terminus with that of a district to facilitate, at the district administration level, coordination between various agencies. A district, we consider, might be too unwieldy. On the basis of the experience of the existing cooperatives, we would suggest that, subject to technical feasibility, the area of a cooperative may extend to about 2 blocks and cover about 800 sq. kms. A cooperative of this size would need a capital investment of about Rs. 150 lakhs. It should be capable of developing economic load, appointing necessary technical and administrative personnel and also be a compact unit to facilitate communication between management and members.

VI

Operational Aspects

Area Coverage

4.61 As a consumer's organisation, the line extension policies of a cooperative should be service-oriented subject to its overall viability. The area coverage concept is an essential feature of a cooperative. This principle requires a society to take into account the overall economics of the project for deciding on construction of a new line instead of linking such decision merely to the economics of a particular line extension. The adoption of this concept also presupposes diligent planning of the extension programme and constant review of its implementation. Such careful planning and implementation are, however, not much in evidence in the existing cooperatives. The management of a society should ensure that a detailed programme of expansion is drawn up for every quarter and review its implementation.

4.62 The application of the principle of area coverage was considered by REC's Advisory Committee in its meeting held in July, 1972. The Committee expressed the view that two sets of situations should be recognised : (i) in agriculturally prosperous areas where the farmers are also conscious of the benefits of rural electrification, the cooperatives should plan and execute their expansion

programme only after ensuring that reasonably adequate load would be available; and (ii) in backward areas, load growth would be a slow process and could perhaps be stepped up only after the new lines are drawn and in such cases, it may not be possible to insist on the criterion of reasonable economic load from the inception. The Advisory Committee, however, emphasised that care should be taken to avoid indiscriminate extension of new lines and that the new construction programme should be preceded by careful planning and promotional efforts. We endorse the approach outlined by the Advisory Committee.

Load Growth

4.63 Rural electrification being a capital intensive industry, its economics is directly dependent on the intensity of the utilisation of the "plant". This underlines the importance of load growth. A basic advantage of a cooperative is that, generally it could step up load growth quicker than a SEB. Studies conducted on the existing cooperatives and to which we made a reference in the preceding chapter, confirm that load growth in cooperatives is generally quicker. Even so, as a developmental organisation, a cooperative should undertake intensive promotional measures for accelerating the pace of load growth.

4.64 In developing loads, it is important that greater attention is paid to increasing domestic and commercial loads which are more paying because of higher tariff. Realisation from domestic and commercial supply is generally 20-25 paise more per unit than from agricultural supply. Further LT and HT industrial loads help a society to expand its sales and bring down the overall cost per unit sold. When a society buys power on two-part tariff basis, the average cost per unit will progressively reduce with increasing consumption. Some LT industrial connections may serve as off-peak loads for bringing down the cost of energy to the society. A cooperative should, therefore, aim at developing an economic load-mix.

4.65 The broad lines on which load promotion should be undertaken by a society, are :

(a) A cooperative should make arrangements with the local banks for financing individuals for electrification of their

homes and for purchase of electric gadgets and the society may undertake to recover the loans along with energy bills. The possibility of taking up agency work for well established electrical firms like GEC, Usha, Orient etc. could be examined for introduction of cheap but useful gadgets,

(b) A cooperative may use part of the special fund created out of interest remission granted by REC, for giving loans, particulary to weaker sections, for electrification of their homes.

(c) In areas where there are large number of small farmers who cannot afford tubewells individually, cooperatives of tubewells may be organised.

(d) The cooperative land development bank as also the State Industries Department should actively be associated with the load promotion in the area of the cooperative.

(e) The value of each share in the existing cooperatives is generally Rs. 25 and some of the societies require that the amount should be paid in one lumpsum. For domestic connections, consumers, particularly weaker sections, might find it difficult to contribute this amount towards the share capital. It would be in the interest of the societies and also the consumers that share value is kept low at, say, Rs. 5 so that the cooperative could get more domestic service connections.

(f) The possibility of extending domestic connections to mud houses in the villages needs to be explored.

(g) A society should be prompt in giving service connections. The pending applications for connections should be constantly reviewed.

(h) The field staff should be made responsible for promotion of load growth. A target should be fixed for them and the progress reviewed periodically.

Extension Services

4.66 A rural electric cooperative should not merely confine its activities to selling of power. Being a consumers' organisation, it should extend other services and facilities to members. It should extend facilities for making arrangements for servicing of electric equipments and installations of the consumers. A cooperative could help in bringing down the cost of electric installations to the consumers, particularly for domestic services, by making effective arrangements with the contractors or by undertaking the work itself. Another important extension function of a cooperative is that it should explain to the consumers the use of simple and modern electrical gadgets and also arrange to supply them. A society may open a small store for selling electrical goods, gadgets and accessories even on consignment basis initially. We would like to emphasise that it is the prompt and efficient service and other facilities provided to the consumers that would esrablish the utility of a cooperative and gain for it the loyalty and confidence of its members.

Line Losses

4.67 A dominant factor influencing the economics of rural distribution of electricity is line loss. In the preceding chapter, we analysed the main reasons for substantial line losses in existing societies and their impact on the profitability of the cooperatives. Although there has been some improvement in recent months in these cooperatives, it should be recognised that this vital problem did not receive adequate and prompt attention of the management of these societies. We should like to add that the assumption of line loss of 10% made in the project reports of the existing societies is also beyond the realm of practicability. We have, therefore, suggested that, for future projects, a line loss of 20% may be assumed at the end of 5 years. Based on the experience of the existing societies, we feel that, with necessary efforts, cooperatives should be able to keep the line losses down to 20%.

4.68 The major causes that have led to line losses in the existing societies are : inadequacy of the system, defective metering, under-loaded transformers, over-loaded feeders and theft of energy. The project reports of some of the existing cooperatives envisage

setting up of more sub-stations to feed the cooperative area. REC has also introduced a system improvement loan which could be availed of by the SEBs for constructing sub-stations and for improving the position of supply to the cooperatives. This system improvement loan could also be availed of by the cooperatives.

4.69. All the existing cooperatives acquired test benches after a lapse of more than one year since their inception. In future, we would strongly urge that each cooperative should have a test bench from its very inception. Other important measures for controlling line losses are :

(a) The cooperatives should identify the underloaded transformers with a view to replacing such transformers wherever necessary.

(b) The meters, particularly the power meters, should be periodically tested.

(c) Every society should undertake annual verification of services and also a critical review of consumption of electricity by bigger consumers.

(d) Over loaded feeders should be identified and the possibility of splitting up the feeders considered.

(e) The consumers of motive power should be persuaded to instal capacitors for improving the power factor leading to reduction in line losses.

(f) The construction standards prescribed by REC should be adopted.

It is of utmost importance that the management of a society should review the line loss of the society feeder-wise and make the staff responsible for it. The staff should be allocated feeder-wise and made responsible for patrolling, testing and checking of meters, meter reading, review of consumption, promotional work and also review of pending applications for connections.

VII

Management

4.70 We observed in chapter III that some of the major shortcomings in the functioning of the existing cooperatives are to be traced to the inadequacies of their internal management. This is an area which needs very careful attention. The internal administrative structure of a cooperative is a three-tier one consisting of the General Body, the Board of Directors and the paid professional management. The welding of elected management with the professional management to ensure smooth and efficient functioning of a cooperative consistent with its democratic character is, indeed, a delicate one. The relative role of the elected and the professional management should be clearly defined in the constitution of the society itself.

Representative General Body

4.71 The membership of a cooperative may reach 10,000 to 15,000. It will not, therefore, be convenient to hold a meeting of all the members. Nor is any fruitful discussion possible in such gatherings. It is, therefore, necessary for all rural electric cooperatives to adopt a system of delegation in which individual members will not directly elect the Board of Directors, but will only elect representatives who will elect the Board members. In this system of representative general body, there will not be any general meeting of all the members of the society; instead, the members may be convened to a number of local meetings to elect the representatives to the general body of the society. The agenda for these local meetings should, of course, cover the whole field of the society's affairs with particular reference to the local problems. The representative general body, which will be a smaller group, should be vested with all powers of the general body.

Board of Directors

4.72 In a cooperative, the Board of Directors are to be elected by the members. With the acceptance of the principle of State partnership in cooperatives, the principle of State participation in management has also been accepted. Normally, such State

participation is to be restricted to nomination of one-third of the total number of members of the Board of Directors or three, whichever is less. There is a provision in the bye-laws of existing cooperatives for nomination by the Registrar/State Government, the entire Board of Directors including the Chairman for an initial period of 3-5 years. The good record of performance of the Sircilla cooperative is to be attributed partly to its Chairman, who is the Collector of the District. As the head of the district administration, the Collector has been able to bring about necessary coordination between various agencies and this has immensely helped the society in implementing its rural electrification programme. In respect of future cooperatives also, we would suggest that, while the accepted principle of State participation may be incorporated in the bye-laws, a transitory bye-law may also be provided empowering the Registrar/State Government to nominate the first Board of Directors including the Chairman for a period of 5 years, that is, up to the construction period. As a policy, the nominees of the State Government/Registrar should be officials and representatives of the local institutions like cooperatives, panchayats, etc. The nominated Board of Directors may consist of : (a) Collector of the District as Chairman (if, for any reason, Collector cannot be nominated as the Chairman, a senior officer of the State Cooperative Department/State Electricity Board/Zilla Parishad, may be nominated); (b) a representative each of the State Cooperation and Industries Departments; (c) a representative of the SEB; (d) a representative of REC, (e) a representative of the Land Development Bank; and (f) three more nominees representing local financing and other institutions.

4.73 We have suggested that the SEB should be closely associated with the management of a rural electric cooperative and that it should also contribute to its share capital. The byelaws of the society may specifically provide for nominees of the SEB and the Registrar on the Board of Management of the society. As load promotion calls for active association of land development bank and the State industries department, we suggest that the byelaws of the society may specifically provide for a representative each of these organisations on their Board of Directors.

4.74 It has been suggested to us that it would be useful to have a

representative of REC on the Board of Management of the rural electric cooperatives. This principle of giving representation to a long-term financing agency has been recognised and some of the State Cooperative Societies Acts have specific provision for a nominee of such financing institution on the Board of Directors of the borrowing cooperatives. We recommend that the byelaws of the future cooperatives may specifically provide for a representative of REC on the Board of Directors. We would also suggest that the byelaws of the existing cooperatives may be amended to provide for this.

4.75 The important functions of the Board of Directors should be :

(a) to assume responsibility for the overall functioning of the society;

(b) lay down policies regarding construction of new lines, provision of services and prescribe time-bound targets to be achieved;

(c) make requisite changes in the long term plan;

(d) appoint a chief executive, define his responsibilities and invest him with adequate powers to discharge his responsibilities efficiently;

(e) approve subsidiary policies, regulations and programme; and

(f) make systematic and periodic appraisal of the progress and problems of the societies.

General Manager

4.76 The General manager constitute the king-pin of the administration of the society. A rural electric cooperative involves an investment of the order of Rs. 1.50 crores, and it has to enlist the support of various development departments, financing institutions, SEB etc. It is, therefore, important that a society should have a senior officer with experience of developmental activities, as its General Manager. The services of a Joint Registrar of Cooperative Societies or an officer of the SEB of the rank of not less than an Executive Engineer, may be secured on deputation for the office of the General Manager of a cooperative. The General

Manager of the society should also be an ex-officio member of the Board of Directors of the society.

4.77 The important functions and responsibilities of the General Manager should be :

(a) assume responsibility for the detailed planning, organisation, coordination, control, direction and carrying out of all programmes and activities of the society in conformity with the policy and programme laid down by the Board of Directors ;

(b) furnish the Board with information necessary for long range planning ;

(c) recommend specific goals to the Board ;

(d) assist the Board in making policies, regulations and programmes :

(e) select and employ personnel to operate the business and delegate the responsibilities and authorities as the business reguires; (key personnel directly reporting to the General Manager should be appointed by the Board of Directors).

(f) furnish the Board periodically with information necessary for making a critical review of the operations of the society.

The duties and responsibilities of the General Manager should be incorporated in the byelaws. The byelaws of the existing societies would also need amendment in the light of the suggestions made above.

Project Engineer

4.78 The Project Engineer has a heavy responsibility in ensuring economic and sound construction and technical efficiency of the whole system. The Project Engineer should be directly responsible to the General Manager. When an officer of the SEB is appointed as a General Manager, no separate Project Engineer need be appointed. To assist him in development and administrative functions, a Deputy/Assistant Registrar of Cooprative Societies may be appointed.

Chief Accountant and other Staff

4 79 Maintenance of the Accounts in some of the existing societies need to be considerably improved. Some of these societies have been finding it difficult to secure the services of competent personnel to work as Chief Accountants. We suggest that the societies may either recruit qualified accountants or obtain the services on deputation of competent officers from SEBs It should be possible for the cooperativies to recruit from the open market other middle and junior level officers.

Inventory Control

4.80 We do not propose to go into the details of accounting procedures of rural electric cooperatives. We referred, in the preceding chapter, to a Committee set up by REC to suggest measures for streamlining the accounting system in the cooperatives. We would like to refer to two major aspects. namely, inventory control and billing system in the cooperatives. In some of the existing societies, no attempt has been made to prescribe maximum and minimum limit of materials to be held in stores with reference to the practical programme of construction. It should be ensured that stock piling in cooperatives is strictly based on construction programme and delivery schedule. There should also be a quarterly or at least half-yearly physical verification of stock in stores. It would also be an advantage if the rural electric cooperatives exchange information among themselves about availability and prices of materials and equipment.

Billing System

4.81 The existing cooperatives are generally making monthly collection of energy bills. In the case of Mula Pravara society, it has been observed that, while the society collects bills monthly, the corresponding SEB does it half-yearly. It needs to be considered in the case of existing cooperatives as also the future ones to be set up whether primary cooperative credit societies could be pressed into service for collection of energy bills. The primary credit societies can sanction, under normal crop-loan system, loans to members for payment of electricity bills as part of kind component of the loan. This part of kind component of the loan could

be paid by the credit societies direct to the electric cooperative. Similarly, where there are cooperative agricultural processing units like cooperative sugar factories, the energy bills of the consumers who are also members of such processing units could be collected through them. This would facilitate collection of energy bills for agriculture once in six months or so when the agricultural produce is marketed.

VIII

Education & Training

Member Education and Member Service

4.82 Member education and member service are important for a rural electric cooperative. In a democratic organisation like the cooperative, member education helps build up an informed membership which is to the mutual advantage of the cooperative as also the members. To enlist the loyalty of the members, member service is crucial. We referred to an Informal Group set up by REC to prepare an outline of a member education programme to be introduced in the pilot rural electric cooperatives. A copy of this Report is at Annexure XII. We agree with the Informal Group on the emphasis they have laid on member service and member education programmes.

4.83 A rural electric cooperative is essentially a service organisation of consumers. The first pre-requisite is that the society's administration should be geared to provision of prompt and efficient services to its consumers. We have suggested elsewhere feeder-wise control and development of the electricity distribution system within the area of a cooperative and also designing of the field staffing pattern to ensure this. Load promotion and technical advice to members regarding gadgets etc., should form part of the responsibility of the technical field staff.

4.84 Area development approach is fundamental to a cooperative. This implies planning and development of various economic programmes in the area. For this purpose, the active assistance of financing as well as other developmental agencies have to be enlisted. The Society has also to guide the members in obtaining necessary finance and advise them on the type of equipment etc.

It should be recognised that it would not be possible for a rural electric cooperative to provide assistance to members individually. The society has, therefore, to develop a system in consultation with other organisations and agencies and make continuous attempts to improve the arrangements to ensure their smooth functioning.

4.85 We have considered whether any special staff should be appointed for this purpose. The three main aspects of work involved are : technical guidance and assistance to the members for promotion of load growth; general guidance required by members regarding finance for purchase of equipment etc.; and taking initiative in planning and developing economic programmes in the area in conjunction with various other agencies. Technical assistance and guidance to members should, as we mentioned earlier, form part of the normal functions of the technical field staff. The other two developmental functions should be the responsibility of one of the key personnel of the society. We have suggested a combination of Executive Engineer as General Manager and a Deputy/Assistant Registrar, or a Joint Registrar as General Manager and an Executive Engineer. These promotional activities should be the responsibility of the cooperative officer, assisted by one or two junior personnel in the office at the headquarters of the society. The staff, for this purpose, in the existing five cooperatives may, as far as possible, be found by reallocation of work among the staff. The General Manager of the society, if he is not directly incharge of this programme, should associate himself closely with it, as it is important for the overall strategy of development of the society.

4.86 The Report of the Informal Group, we referred to earlier, suggested that for providing central guidance and direction and for coordinating the programme as a whole, a Central Member Education and Member Service Programme Committee should be appointed at the all-India level, located either in REC or in NCUI. The Cooperative Division of REC, we consider, should be able to provide necessary guidance and assistant to the cooperatives and it might, wherever necessary, seek the help of other specialised institutions.

Training

4.87 During our visit to one of the societies, we found that

its construction programme was held up for want of skilled labour. As a developmental agency, a rural electric cooperative should make efforts to recruit local people and arrange for giving some training to them. Another aspect which should receive the attention of the cooperatives is that of training selected educated youth of the villages in safety measures and replacement of fuses. REC could help the societies in the programming and developing of such schemes and in brining out publicity material.

4.88 We have mentioned earlier that the first set of General Managers and Chief Engineers of Cooperatives were trained in USA., and they are gradually being replaced by fresh incumbents. It is important that the new incumbents should receive some orientation training about the objectives of the programme and the mechanism of its implementation. For this purpose, we would suggest a 4-5 weeks orientation course for the staff in the Vaikunth Mehta National Institute of Cooperative Management, Poona, or in any other institute where facilities are available for such training. For the middle level officers also, a similar three weeks training course may be organised preferably at the society level. For junior personnel and field staff, periodical 2-3 days orientation programme might be organised at the society level, particularly in consumer servicing and safety measures. For the programmes at the society level, the officers of SEB should be associated. Regular school for linemen may have to be started to ensure regular supply of trained personnel.

IX

Supervision

4.89 The arrangements for supervision over the existing rural electric cooperatives either by SEBs or the State Cooperative Departments are not adequate. The primary responsibility for providing assistance and guidance to, and exercising supervision over, the rural electric cooperatives is that of the State Cooperative Department and the State Electricity Board. We examine in the succeeding paragraphs the role of the State Cooperative Department, SEB and REC in promoting and guiding rural electric cooperatives.

State Cooperative Departments

4.90 Organisation and registration of a cooperative is essentially the primary responsibility of the Registrar. We have suggested that a representative of the Registrar of Cooperative Societies should be on the Board of Management of a rural electric cooperative. This officer should be of the rank of Joint Registrar of Cooperative Societies so that he could keep in close touch with the society with a view to helping it to solve its problems. The State Cooperative Department should also undertake periodical inspection of the working of a society with view to providing necessary administrative and financial guidance to it. Further, the audit of cooperative societies is the statutory responsibility of the Registrar. But, we observed that in some existing societies, audit is in substantial arrears. Prompt audit of accounts of rural electric cooperatives with large investments, needs hardly any emphasis. The Cooperative Department should also ensure that these societies introduce the system of concurrent audit and periodical physical verification of stocks.

Role of SEB

4.91 A rural electricfication scheme implemented by a cooperative is essentially a part of the overall programme of rural electrification in the State. A cooperative project has all the economic and social objectives of a similar scheme implemented by a SEB. We, however, noticed the tendency to regard cooperatives as mere licensees and to equate them with private licensees obtaining a licence under the Act for distribution of electricity. Legally, a cooperative is a licensee; but it is a licensee with a difference, for, it shares with the SEB its social objective. Cooperative projects should, therefore, be conceived as an integral part of the overall programme of rural electrification in a State. In terms of Section 18 of the Electricity (Supply) Act, 1948, the SEB is "charged with the general duty of promoting the coordinated development of the generation, supply and distribution of electricity within the State in the most efficient and economical manner, with particular reference to such development in areas not for the time being served or adequately served by any licensee....." The SEBs have thus an overall responsibility for power development and distribution in the State. They should, therefore, be closely associated

with the formulation as well as the implementation of the cooperative projects. The areas in which a SEB could assist a rural electric cooperative, are

(a) formulation of the project;

(b) technical scrutiny of the programme of line extension and also of the estimates of works prepared by the cooperative ;

(c) contribution to the share capital of the cooperative by converting 50% of the value of assets transferred to it;

(d) participation in the management of the cooperative;

(e) lending the services of technical personnel as also of accountants, wherever necessary; and

(f) assisting the society in securing material and equipment for construction without centage charges.

Role of REC

4.92 One of the objectives of REC, as we mentioned earlier, is to promote and finance rural electricity cooperatives in the country. In pursuance of its developmental role, REC has a Cooperation Division in its organisation. Besides, officers of the Technical, Finance and Accounts Division of the Corporation also have been periodically visiting these societies and providing necessary guidance and assistance. The State Governments may not appoint special staff for supervision of rural electric cooperatives unless there are adequate number of societies. REC may, therefore, have to continue to assume responsibility for the promotion and development of rural electric cooperatives. A singal self-contained unit in REC should be made responsible for giving guidance to and exercising supervision over the cooperatives, covering the entire range of technical, administrative and financial matters.

X

Legislation on Electricity and Cooperatives

4.93 In terms of Item II of the Schedule to the Indian Electricity Act, 1910, the annual statement of accounts of licensees should be audited by such persons as the State Government may appoint or approve. It would be relevant to note in this connection that,

under the State Cooperative Societies Act, it is a statutory responsibility of the Registrar (excepting in U.P.) to audit the accounts of every society annually. However, Item II (c) of the same Schedule lays down that "audit should be made and conducted in such a manner as the State Government may direct". In terms of this provision, the State Governments may direct that the audit of rural electric cooperatives may be done by the State Registrars in terms of the State Cooperative Societies Act.

4.94 The Sixth Schedule to the Electricty (Supply) Act, 1948, governing financial principles and their application to licensees, is intended mainly to control the profits of the licensees. *Prima-facie*, in principle, this is not applicable to a cooperative which is a service organisation and not a profit seeking one. It may, therefore, be considered whether cooperative may be exempted from the application of the provisions of the Sixth Schedule.

XI

Future Programme

4.95 When the five pilot cooperatives were organised, the Ministry of Irrigation and Power circulated a note to the State Governments and the SEBs. A copy of this note is at Annexue XIII. This note observes :

> "The five rural electric cooperatives set up in the country have been organised at the instance of the Government, as pilot projects and their working results will have to be watched for at least 2-3 years. Normally, therefore, no new rural electric cooperative should be organised for the next 2-3 years, by which time the success or otherwise of the cooperative pilot projects could be properly assesssed. On the basis of such assessment a suitable programme for organising more rural electric cooperatives could be incorporated in the 5th Five Year Plain".
>
> "It is, therefore, felt that the States might start considering proposals for organistation of rural electric cooperatives, some time during 1973-74, so that a beginning could be made in organising rural electric cooperatives during the first year of the Five Year Plan, by which time the assessment of the working of the five pilot projects could be available."

The programme of rural electric cooperatives was also considered by the Conference of State Ministers of Cooperation held in November, 1971. The Conference suggested that the Rural Electrification Corporation may undertake preliminary surveys and feasibility studies for organising a few more such societies in the States not covered by the existing pilot rural electric cooperatives.

4.96 We have, in this Chapter, suggested the lines on which new rural electric cooperatives may be organised. Our terms of reference do not require us to suggest any definite extent of the programme of expansion of rural electric cooperatives. As we observed in the preceding Chapter, any large scale expansion of rural electric cooperatives should await adequate experience covering a larger number of societies over a longer period. For this purpose, the experiment of rural electric cooperatives may be further expanded during the Fifth Plan. The target for cooperatives in the Fifth Plan needs to be considered in the overall context of the programme of rural electrification and the financial outlay for it. We understand that the target for cooperatives in the Fifth Plan is being considered by the Task Force on Rural Electrification which is examining the entire programme of rural electrification in the Fifth Plan. We would only add that preliminary steps may be initiated in the last year of the Fourth Plan itself so that the societies programmed for the Fifth Plan could commence operations during the first two years of the Fifth Plan and adequate experience of their working would be available for considering further expansion of the programme in the subsequent Plans.

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CHAPTER V

SUMMARY OF CONCLUSIONS AND SUGGESTIONS

Overall Assessment

(1) The experience of the existing rural electric cooperatives extends only to five societies spread over about two years. It is, therefore, too early to make any final assessment of their performance or promise. Even so, the overall record of performance of the Sircilla and the Hukeri societies is very encouraging. The Lucknow society has given a fairly good account of itself. The Mula Pravara and the Kodinar societies, for certain reasons, could not make much headway,

(2) The studies conducted by the Indian Institute of Management, Ahmedabad, and others have brought out that, generally the performance of cooperatives compares favourably with that of the respective SEBs and that the operational procedures of cooperatives are better tuned to the requirements of the consumers.

(paras 3.13 to 3.30)

(3) The capital structure of the existing societies has rendered the economics of their operations vulnerable. There is practically no debt-equity ratio in these societies and the entire funds required for investment, are obtained as loans from REC.

(para 3.80)

(4) In terms of the project reports, all the cooperatives except Hukeri were to earn profit in the first year of their operations; but, only Hukeri society has earned profit. The

two major factors that contributed to the loss of these societies are line losses and inadequate margin between tariff for bulk power and tariff to the consumers.

(para 3.95)

(5) The project reports of all the societies assumed a line loss of only 10%. Actual line losses obtaining in the societies—varying from 25% to 48%— have upset the economic forecast made in the project reports. This crucial problem of line loss has also not received adequate and early attention of the societies.

(paras 3.40 to 3.51)

(6) The margin available to cooperatives between the purchase rate and the rate of realisation per unit purchased is very slender rendering the operations of most of the societies uneconomic.

(paras 3.85 to 3.92)

(7) Given the present tariff structure and the trends in growth of load and energy sale, the working results of all the societies even in the sixth year may not yield adequate surplus to enable them to meet their commitment to REC. The working results in the tenth year of many of the societies may not also yield adequate surplus to enable them to service REC loans.

(paras 3.93 to 3.104)

(8) The crucial aspect which needs immediate attention is reduction of tariff for purchase of bulk power particularly in respect of Kodinar, Mula Pravara and Hukeri societies.

(para 3.104)

(9) The inadequacies for which remedies have to be sought within the cooperatives themselves relate mainly to streamlining of the administrative arrangements, proper delegation of powers to the chief executives, effective control

over line losses, proper system management, member education and member service programmes, proper budgetary and inventory controls and better maintenance of accounts.

(paras 3.52 to 3.75)

Basic considerations underlying promotion of rural electric cooperatives

(10) Although cooperatives, at this stage, may not be able to confer direct economic benefits on their members, their better response to consmer needs which is of vital importance in the administration of a public utility, provides a motivation for individual consumers to organise themselves into a cooperative. The other angles to the consideration of the expansion of this programme of rural electric cooperatives are:

(a) considering that 80% of villages in the country are yet to be electrified, there is scope for developing cooperatives to supplement the efforts of the SEBs for accelerating the pace of rural electrification;

(b) being local level organisations, cooperatives will be better suited to meet the special requirements of rural distribution for better consumer service, consumer participation, load promotion and self-policing of the system;

(c) in the long run, different technologies and procedures and organisations may have to be evolved to impart efficiency and economy to the rural distribution system, and cooperatives may fill the role of specialised agencies for distribution of electricity in rural areas;

(d) a cooperative, as an independent organisation, can be an effective focal point for coordinating the activities of various developmental and financing institutions and facilitate the implementation of area development programmes; and

(e) cooperative could serve as a useful agency for introducing innovation; in rural electric distribution system.

(paras 4.1 to 4.12)

Basic approach to rural electric cooperatives

(11) A rural electric cooperative should be an integral part of the overall programme of rural electrification for servicing agriculture and stimulating rural economic growth. It should not be considered as a mere licensee for retailing electricity in rural areas. Cooperative schemes should be project-based and area coverage should be an essential feature of the schemes. SEB and other developmental agencies should be fully associated with the formulation and implementation of cooperative projects.

(paras 4.57, 4.61 and 4 62)

Concept of viability

(12) The minimum viability of a society should, in the first instance, be deemed to be indicated by its capacity to service the loans and at least break even. After the initial period of five years, a society should be able to throw up surplus, build up some reserve and also be in a position to pay a reasonable dividend to its members on their share holdings. For improving the financial viability of a society :

(a) It should have a debt-equity ratio of 70 : 30; and

(b) It should have adequate margin between rates for purchase and sale of power.

(paras 4.24 and 4 28)

Size and location of cooperative

(13) The jurisdiction of a cooperative may extend to about 800 sq. kms. or about 2 blocks or a taluka. Such a cooperative should have about 1200 kms. of HT and LT lines, a total connected load of about 17,000 kws. and the annual energy sales should be of the order of 150 lakh units at the end of the fifth year.

(para 4.27)

(14) The availability of groundwater resources, potential for agricultural development, prospects of agro-based industries and possibility of developing adequate and economic loads should be carefully examined before organising a rural electric cooperative. As the project approach envisages support from various institutional agencies, it should be ensured that the basic infra-structure for providing necessary facilities like credit etc., is available in the area.

(para 4.58)

Capital cost and resources

(15) The capital cost of a cooperative of the size indicated above could be around Rs. 150 lakhs, which may broadly be met from the following sources :—

	Rs. in lakhs.
Contribution from members including conversion of part of security deposits, and service connection charges	10
State Government and SEB*	35
Loan from REC on State Government guarantee	105
Total :	150

(16) On the analogy of Reserve Bank's assistance to State Governments for participation in the share capital of co-operative credit institutions, REC may consider providing long-term loans to State Governments. The quantum of assistance from REC to the State Governments may be restricted to about 15% of the total cost of a cooperative.

(para 4.35)

Terms and conditions of REC loan

(17) REC may give loans repayable in 35 years with a moratorium for the first 5 years. The rate of interest may be 4% for the first 10 years, 6% from the 11th to the 25th year and 8% from the 26th to the 35th year.

(paras 4.38 and 4.39)

*SEB may convert 50% of the value of assets transferred to a cooperative as share capital, subject to a maximum of 10% of the capital cost of the project.

(18) REC may remit interest for the first three years.

(para 4.40)

(19) REC may give loans on the guarantee of State Government concerned. For future cooperatives, it may also require the State Governments to give an undertaking that they would meet or make arrangements to meet the shortfall, if any, in the resources of a society to complete the project.

(para 4.41)

Working capital

(20) In the initial years, a cooperative may utilise part of the resources raised from members towards working capital. Later, it may arrange with a local cooperative or commercial bank for working capital loan on State Government's guarantee.

(para 4.42)

Tariff for future cooperatives

(21) (a) Tariff for the first three years may be fixed at a rate which should be equal to the net return to the SEB in that area calculated on the basis suggested at para 4.52.

(b) At the end of three years, the position may be reviewed by a Committee consisting of representatives of the society, SEB, the State Government, the Registrar, and REC with a view to suggesting suitable modifications keeping in view the capital cost, trends in load growth, line losses and financial viability of the society in the sense indicated earlier.

(c) At the end of six years, another review may be made by the Committee, to consider further modifications in the rate of purchase of power keeping in mind the financial position of the society, its capacity to pay more and the provision for reserves as also for payment of reasonable dividend to the shareholders.

(d) Thereafter, there may be a periodical review by the Committee once in five years.

(e) Another principle that should govern the periodical review of tariff is that, as soon as the society crosses the break even point, the tariff should be fixed nearer the cost to the SEB at 11 KV bus, taking into account the amout for allocation to reserve and for payment of dividend.

(f) The rates of power proposed by the Review Committee from time to time, may be subject to approval by REC.

(para 4.53)

Tariff for existing cooperatives

(22) The principles suggested for future cooperatives should be applicable to the existing cooperatives also. The first review suggested after three years for the new cooperatives may be undertaken in respect of the existing ones for being given effect to from the financial year 1973-74 on the basis of the working and the financial results of the societies for the year 1972-73.

(para 4.54)

Government subsidies

(23) Subsidies provided by the State Governments to SEBs for rural electrification should be extended to rural electric cooperatives.

(para 4.56)

Load growth

(24) A cooperative should aim at developing not only an adequate load but also a proper load-mix for maximising its return. The lines on which load promotion is to be undertaken by a society, are indicated at para 4.65.

Line losses

(25) The assumptions of a line loss of 10% made in the project reports of existing societies is beyond the realm of practicability. For future projects, a line loss of 20% may be assumed at the end of 5 years. Based on the experience of the existing societies, it is considered that it should be possible for cooperatives to keep their line losses down to 20%.

(para 4.67)

(26) REC has introduced a system improvement loan which could be availed of by SEBs for constructing substations and for improving the position of supply to the cooperatives. This system improvement loan could be availed of by cooperatives also.

(para 4.68)

(27) Every cooperative should have a test bench from its very inception. The management of a society should review the line losses feeder-wise and make the staff responsible for it. The staff should be allocated feeder-wise and made responsible for patrolling, testing and checking of meters, meter reading, review of consumption, promotional work and also review of pending applications for connections.

(para 4.69)

Management

Representative general body

(28) All rural electric cooperatives should adopt a system of representative general body in which individual members will not directly elect the Board of Directors, but will only elect representatives who will elect the Board members.

(para 4.71)

Board of Management

(29) A transitory byelaw may be provided in all the future cooperatives for nomination by Registrar/State Government of the entire Board of Directors for the first five years. The nominated Board may consist of :-

(a) Collector of the District or a senior officer of the State Cooperative Department/State Electricity Board/Zilla Parishad as Chairman;

(b) A representative each of the State Cooperation and Industries Departments.

(c) A representative of SEB.

(d) A representative of REC.

(e) A representative of the land development bank.

(f) Three more nominees representing local financing and other institutions.

(para 4.72)

(30) The byelaws of the societies may specifically provide for nominees of SEBs and the Registrar on the Board of Management of the society. As load promotion calls for active association of the land development bank and the State Industries Department, the byelaws may specifically provide for a representative each of these organisations on their Board of Directors.

(para 4.73)

(31) The byelaws of future cooperatives may specifically provide for a representative of REC on their Board of Directors. The byelaws of the existing cooperatives may be amendeded to provide for this.

(para 4.74)

General Manager

(32) A society should have a senior officer with experience of development activities as a General Manager. The services of a Joint Registrar of Cooperative Societies or an officer of SEB of the rank of not less than an executive engineer may be secured on deputation for the office of the General Manager of a cooperative.

(para 4.76)

(33) The General Manager should also be an ex-officio member of the Board of Directors of the society. The duties and responsibilities of the General Manager should be incorporated in the byelaws of the society on the lines indicated at para 4.77. The byelaws of existing societies would also need to be amended.

(paras 4.76 to 4.77)

Project Engineer

(34) The Project Engineer should be directly responssbe to the General Manager. When an officer of the SEB is appointed as a General Manager, no separate Project Engineer need be appointed. To assist him in developmental and administrative functions, a Deputy/Assistant Registrar of Cooperative Societies may be appointed.

(para 4.78)

Chief Accountant & other staff

(35) Societies may either recruit qualified accountants or obtain the services, on deputation, of competent officers from the SEBs to work as accountants. The other staff required may be recruited by the societies, as far as possible, from the open market.

(para 4.79)

Inventory control

(36) It should be ensured that stock piling in cooperatives is strictly based on construction programme and delivery schedule. There should also be a quarterly or at least half-yearly physical verification of stocks. It would be an advantage if the rural electric cooperatives exchange information among themselves about availability and prices of material and equipment.

(para 4.80)

Collection of bills

(37) In the case of existing cooperatives as also the future ones to be set up, it may be considered whether primary co-operative credit societies and other cooperative institutions like sugar factories etc., may be pressed into service for collection of energy bills. This wou'd facilitate co'lection of energy bills for agriculture once in six months or so when the agricultural produce is marketed.

(para 4.81)

Promotional activities

(38) It is the prompt and efficient service and other facilities provided to the consumers that would establish the utility of a cooperative and gain for it the loyalty and confidence of its members. The services to be provided by a cooperative should include servicing of electrical equipment of consumers; assisting the consumers in the internal wiring of their homes, demonstration of electrical equipment, arrangements for selling electrical goods, gadgets and other accessories.

(para 4.66)

(39) Area development implies planning and development of various economic programmes in the area. For this purpose, the active assistance of the financing as well as other developmental agencies has to be enlisted. As it would not be possible for a cooperative to provide assistance to members individually, it should develop a system in consultation with other organisations and agencies and make continuous attempts to improve the arrangements.

(para 4.84)

(40) The promotional activities should be the responsibility of the cooperative officer assisted by one or two junior officers in the office at the head quarters of the society. The staff, for this purpose, in the existing 5 cooperatives may, as far as possible, be found by reallocation of work among the staff. The General Manager of the society, if he is not directly incharge of this programme should associate himself closely with it, as it is important for the overall strategy of development of the society.

(para 4.85)

(41) The Cooperation Division of REC may provide necessary advice and guidance to cooperatives in their promotional work and, wherever necessary, seek the help of the other specialised institutions.

(para 4.86)

Training

(42) The rural electric cooperative should make efforts to recruit local people and arrange for giving some training to them in construction work. Another aspect which should receive the attention of the cooperatives is that of training selected educated youth of the villages in safety measures and replacement of fuses. REC could help the societies in the programming and development of such schemes and also in bringing out publicity material,

(para 4.87)

(43) For senior personnel of the cooperatives, 4-5 weeks orientation course may be organised in the Vaikunth Mehta National Institute of Cooperative Management, Poona or in any other institute. For the middle level officers also, a three-week training course may be organised, preferably at the society level. For junior personnel and field staff, a periodical 2-3 days orientation course may be organised at the society level, particularly in consumer servicing and safety measures. For the programmes at society level, the officers of SEBs should be closely associated. Regular school for linemen may have to be organised to ensure availability of requisite trained personnel.

(para 4.88)

Supervision

(44) The State Cooperative Department, the SEB and the REC should assist in promoting and guiding the rural electric cooperatives.

Registrar

(a) Organisation and registration of a cooperative is essentially the primary responsibility of the Registrar.

(b) The cooperative officer to be nominated on the Board of Management of a rural electric cooperative should be of the rank of a Joint Registrar.

(c) The cooperative department, besides arranging for prompt audit of societies, should also ensure that societies introduce a system of concurrent audit and periodical physical verification of stocks.

(para 4.90)

State Electricty Boards

(b) The SEBs should be closely associated with the formulation as well as implementation of cooperative rural electrification projects. The areas in which SEB could assist a rural electric cooperative are listed at para 4.91

Rural Electrification Corporation

(e) The State Government may not appoint special staff for supervision of rural electric cooperatives unless there are adequte number of societies. REC may, therefore, have to continue to assume responsibility for the promotion and development of rural electric cooperatives. A single self-contained unit in REC should be made responsible for giving guidance to and exercising constructive supervision over the co-operatives, covering the entirie range of technical, administrative and financial matters.

(para 4.92)

Legislation

(45) In terms of the provisions of the Indian Electricity Act, the State Governments may direct that the audit of rural electric cooperatives may be done by the State Ragistrars under the State Cooperative Societies Act.

(para 4.93)

(46) The Sixth the schedule to the Electricity (Supply) Act, 1948 governing financial principles and their application to licensees, is intended mainly to control the profits of private licensees. Prima-facie, in principle, this is not applicable to a cooperative, which is a service organisation and not a profit seeking one. It needs, therefore, to be considered whether cooperatives may be exempted from the application of the provisions of the Sixth Schedule.

Promise of cooperatives

(47) Regarding the promise of rural electric cooperatives, it would be necessary to await adequate experience covering a larger number of societies over a longer period. The capacity the Sircilla and the Hukeri societies have demonstrated in implementing the programme of rural electrification coupled with better consumer response which is important to the administration of public utility, points to the potential of cooperatives to contribute the overall programme of rural electrification.

(para 4.96)

Future programme

(48) The experiment of rural electric cooperatives may be further expanded during the 5th Plan. The size of the programme would necessarily be dependent on the overall programme of rural electrification. But preliminary steps may be initiated in the last year of the 4th Plan itself so that the societies programmed for the 5th Plan could commence operations during the first two years of the 5th Plan and adequate experience of their working would be available for considering further expansion of the programme in subsequent Plans.

(S. S. PURI)

(N. CHATURVEDI)

(C. LAXMIPATHY)

(P. K. RAMANUJAM)

(N. S. MATHUR)

NEW DEDHI
May, 1973.

STATEMENTS

STATEMENT NO. I

Pilot Rural Electric Cooperatives—Preliminary Data

	Name of the Society	Date of Registration	Area of operation No. of villages	Project area according to the Project Report	Date of obtaining licence for distribution of electricity	Area for which licence has been obtained	Period for which licence has been obtained	Date of commencement of operations	Population	Area under cultivation (in lakh acres)	No. of wells	No. of pumpsets as on the date of taking over
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1.	The Cooperative Elec. Supply Society Ltd., Sircilla, Karimnagar (A.P.)	30.10.69	One Revenue Taluka 173 Villages	718 Sq. Miles	25.5.70	Sircilla Taluka	20 years	1.11.70	3,08,000	1.86	25,000	2299
2.	The Hukeri Taluka Cooperative Rural Elec. Soc. Ltd., Hukeri (Mysore)	31.7.69	Hukeri Taluka 121 Villages	382 Sq. Miles	19.11.69	Hukeri Taluka	40 years	12.10.70	1,95,659	1.74	4616	743
3.	The Kodinar Rural Elec. Coop. Soc. Ltd. Kodinar Distt. Amreli (Gujarat)	30.7.69	107 Villages	115 Sq. Miles	29.12.69	Kodinar Tq. certain parts of Verawal Una Tq. of Junagadh Dt.	30 years	11.1.71	1,15,600	1.25	6000	392

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
4. The Mula Pravara Elec. Coop, Soc. Ltd., Rahuri, Dt. Ahmednagar (Mah.)	2.10.69	82-Rahuri Tq. 75 Shriram-pur 5-Newasa 5-Sangamner	726 rq miles	28.1.71	167 villages	N.A.	1.3.71	3,50,000	3.09	8757	7759
5. The Cooperative Elec. Supply Soc. Ltd., Lucknow	15.10.69	571 out of 907 villages in Lucknow District.	703 Sq. miles	6.4.70	Block Deve-lopment area of Mohanlal Ganj, Gosainganj, Sarojninagar, Kakori and Malihabad	10 years	29.3.71	4,86,526	2.81	7000	628

STATEMENT NO. II

Pilot Rural Electric Cooperatives—Membership, General Body and Board of Management as on 31-3-1972

Name of the society	Membership as on 31-3-1972							No. of Service connections taken over from SEB	Of Col. 9 Number admitted as members	No. of service connections given by the Soc. after its functioning	Of Col. 11 No. admitted as mem bers	No. of members admitted as members to whom no service conn. has not yet been given	No. of General Body meetings held so far	Term of the Board of Management	Total No. of Board meetings held so far
	Individuals		Small Industrialists	Panchayats/ Municipalities	Other Coops.	Others	Total								
	Agriculturist	Others													
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Sircilla	8324	564	7	13	6	13	8927	4720	418	3445	3445	5064	2	3 yrs. from 11-3-70	18
2. Hukeri	1962	597	—	25	30	11+1 (Govt.)	2626	5609	789	1913	1445	394	4	3 yrs. from 13-2-70	25
3. Kodinar	4878	—	—	—	5	1 (Govt.)	4884	3594	380	867	867	3637	2	3 yrs. from January 70	1
4. Mula-Pravara	5049	—	—	30	16		—5095	13755	1554	1568	164	3499	4	Nominated at the time of registration for one year & extended subsequently	30
5. Lucknow	1593	1325	40	15	47	1	3021	3208	575	990	990	1456	2	5 yrs. from 23-10-69	21

STATEMENT NO. III

Pilot Rural Electric Cooperatives—Resources as on 31.3.72

(Rs. in lakhs)

Name of the socy.	Share capital			Internal Resources				Borrowings from REC			Service connection charges collection from members	Security Deposits received from consumers			Total resources
	State Govt.	Others	Total	Statutory Reserve Fund	Spl. Fund	Others	Total	For SEB assets	New construction works	Total		Amt. transferred by SEB.	Amt. recd. by the Soc. after its starting	Total	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Sircilla	—	4.17	4.17	—	6.57	—	6.57	48.58	115.47	164 05	0.92	2.30**	3.05	5 35	178.76
2. Hukeri	1.70	0.79	2.49	0.05	3.96	0.50	4.51	43.77	27.63	71.40	0.32*	1.90	1.41	3.31	82.03
3. Kodinar	2.00	2.41	4.41	0.05	1.76	—	1.81	21.35	33.43	54.78	0.57	Nil	0.33	0.33	61.90
4. Mula-Pravara	—	1.55	1.55	0.10	8.07	0.55	8.72	167.00	46.00	213.00	2.26	0.65**	2.49	3.14	228.02
5. Lucknow	—	1.25	1.25	—	3.18	—	3.18	56.00	33.48	89.48	4.10	Nil	1.08	1.08	99.09

*Supervision & construction charges.

**Amount yet to be received.

STATEMENT NO. IV

Pilot Rural Electric Cooperatives—Resource Utilisation as on 31.3.1972

(Rs. in lakhs)

Name of the Society	Total resources	Amount given to SEBs for taking over of assets	Value of new works executed	Value of works under construction	Investment in stores	Investment in tools, plant, vehicles etc.	Other fixed assets	Total	Total O&M expenditure for 1971-72
1. Sircilla	178.76	48.58	33.68	72.00	7.82	3.93	8.16	174.17	2.63
2. Hukeri	82 03	43.77	22.17	0.22	6.32	0.26	0.26	74.74	1.82
3. Kodinar	61.90	21.35	9.09	1.18	25.07	1.14	Nil	57.87	1.80
4. Mula-Pravara	228.02	167.00	22.07	2.20	7.01	3.08	2 10	199.72	7.45
5. Lucknow	99.09	56.00	26.39	15.73	10.71	1.42	—	110.25	3.66

STATEMENT NO. V

Pilot Rural Electric Cooperatives—

Details of Capital Expenditure as on 31-3-1972

Name of the society	Cost of assets taken over from SEB	Cost of new works completed	Value of works under progress	Stock in hand	Total
(1)	(2)	(3)	(4)	(5)	(6)
1. Sircilla	48.58	33.68	72.00	7.82	162.08
2. Hukeri	43.77	22.17	0.22	6.32	72.48
3. Kodinar	21.35	9.09	1.18	25.07	56.19
4. Mula Pravara	200.00	22 07	2.20	7.01	231.28
5. Lucknow	78 00	26.39	15.73	10.71	130.83

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STATEMENT NO. IX

Pilot Rural Electric Cooperatives

Profit & Loss Account For 1971-72

(Rs. in lakhs)

	Particulars	Sircilla (1971-72)	Hukeri (1971-72)	Kodinar (7/71 to (3/72)	Mula-Pravara (1971-72)	Lucknow (1971-72)
I.	*Expenditure*					
1)	Cost of power	8.70	5.85	6.08	51.55	14.11
2)	Distribution of high & medium low voltage line O&M	1.09	0 96	0.76	4.89	2.87
3)	Operation & maintenance for public lighting	0 08	0.08	0.02	0.27	0 03
4)	Consumer servicing	0.94	0.43	0.28	2.29	0.76
5)	General Estt. charges..	0.52	0.35	0.74	—	Nil
6)	Depreciation	2.89	1.44	0 84	7.62	2.53
7)	Interest on REC loans	2.29	2.02	1.25	7.69	2.29
8)	Contingency Reserves	—	0.18	0 16	0.56	—
9)	Other Reserves	—	0.09	—	—	—
	Total :—	16.51	11.50	10.13	74 87	22.59
10)	Profit	—	0.90	—	—	—
11)	Grand Total	16.51	12.40	10.13	74.87	22.59
II.	*Receipts*					
1)	Sale of power	13.55	11-62	6.93	51.16	21.55
2)	Misc. Revenue	2.53	0.78	0.47	5.50	0.91
3)	Deficit	0.43	—	2.73	18.21	0.13
4)	Total	16.51	12.40	10.13	74.87	22.59
III.	*Loss/Profit Upto 31.3.1972*	(1.07)	+0.90	(4.60)	(18.91)	(0.13)

STATEMENT NO. X

Pilot Rural Electric Cooperatives—
Comparative Statement as on 31.3.1972

		Sircilla	Hukeri	Kodinar	Mula-Parvara	Lucknow	Average Society
1.	Area in (sq. kms)	1850	965	296	1880	1800	1358
2.	Length of HT & LT (Kms)	1487	513	284	1992	956	1046
3.	Con. load KW	15735	6617	4800	35318	12047	14903
4.	Annual Sales lakh KWH	77.72	53.02	46.30	283.56	104.51	113.02
5.	Cost per Km (Approx)	9500	12854	10718	11148	10918	10781
6.	No of connections/KM	5.7	14.6	15.7	7.7	4.6	8.06
7.	Con. load/Km.	10.6	12.9	17	18	12.6	14.25
8.	Annual sales/ KM-(KWH)	5227	10335	16303	14235	10932	11406
9.	Consumption/KW-(KWH)	554	801	959	790	867	758.57
10.	Total revenue (Rs. lakhs)	13.55	11.62	9.14	51.16	21.55	21 40
11.	Revenue/ KM (Rs.)	911	2265	3218	2568	2254	2046
12.	Revenue/ Unit sold (Paise)	17.4	21.4	20.15	18.04	20.6	18.93
13.	%age line losses	27.4	34	24.7	48.29	26-25	39.9
14.	Cost of power per unit bought	8	7.4	13.4	9	10	—
15.	Realisation per unit bought.	12.6	14	15.07	9.02	15.2	—

STATEMENT NO. X

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Comparative Statement as on 31.3.1972

		Sircilla	Hukeri	Kodinar	Mula-Parvara	Lucknow	Average Society
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5.	Cost per Km (Approx)	9500	12854	10718	11148	10918	10781
6.	No of connections/KM	5.7	14.6	15.7	7.7	4.6	8.06
7.	Con. load/Km.	10.6	12.9	17	18	12.6	14.25
8.	Annual sales/ KM-(KWH)	5227	10335	16303	14235	10932	11406
9.	Consumption/KW-(KWH)	554	801	959	790	867	758.57
10.	Total revenue (Rs. lakhs)	13.55	11.62	9.14	51.16	21.55	21 40
11.	Revenue/ KM (Rs.)	911	2265	3218	2568	2254	2046
12.	Revenue/ Unit sold (Paise)	17.4	21.4	20.15	18.04	20.6	18.93
13.	%age line losses	27.4	34	24.7	48.29	26-25	39.9
14.	Cost of power per unit bought	8	7.4	13.4	9	10	—
15.	Realisation per unit bought.	12.6	14	15.07	9.02	15.2	—

Contd. STATEMENT XI

Village electrification and pumpset energisation—Progress Since 1966—All India

		No. of villages electrified	No. of pumpsets energised (Lakhs)
1.	As on 31.3.1966	44,982	5.13
2.	Added during :		
	a) 1966-67	9,394	1.36
	b) 1967-68	8,599	2.00
	c) 1968-69	11,344	2.39
	d) 1969-70	15,635	2.66
	e) 1970-71	17,421	2.75
	f) 1971-72	14,719	2.61
3.	Cumulative position as on 31-3-1972	1,22,094	18.90

STATEMENT NO. XII

State-wise Estimates of Line Losses in LT Distribution

1969-70

	State	%age of line losses	
		Imputable to LT Sales when losses in HT sales are assumed at	
		5%	10%
1.	Andhra Pradesh	38.6	36.5
2.	Assam	28.2	25.0
3.	Bihar	39.6	36.0
4.	Gujarat	32.0	27.0
5.	Haryana	40.0	38.6
6.	Kerala	44.0	35.2
7.	Madhya Pradesh	31.9	24.1
8.	Maharashtra	32.6	23.2
9.	Mysore	38.0	32.8
10.	Orissa	21.5	—
11.	Punjab	33.2	39.4
12.	Rajasthan	34.8	31.8
13.	Tamil Nadu	34.2	30.8
14.	Uttar Pradesh	39.0	36.2
15.	West Bengal	18.9	6.7
	All India	35.5	30.6