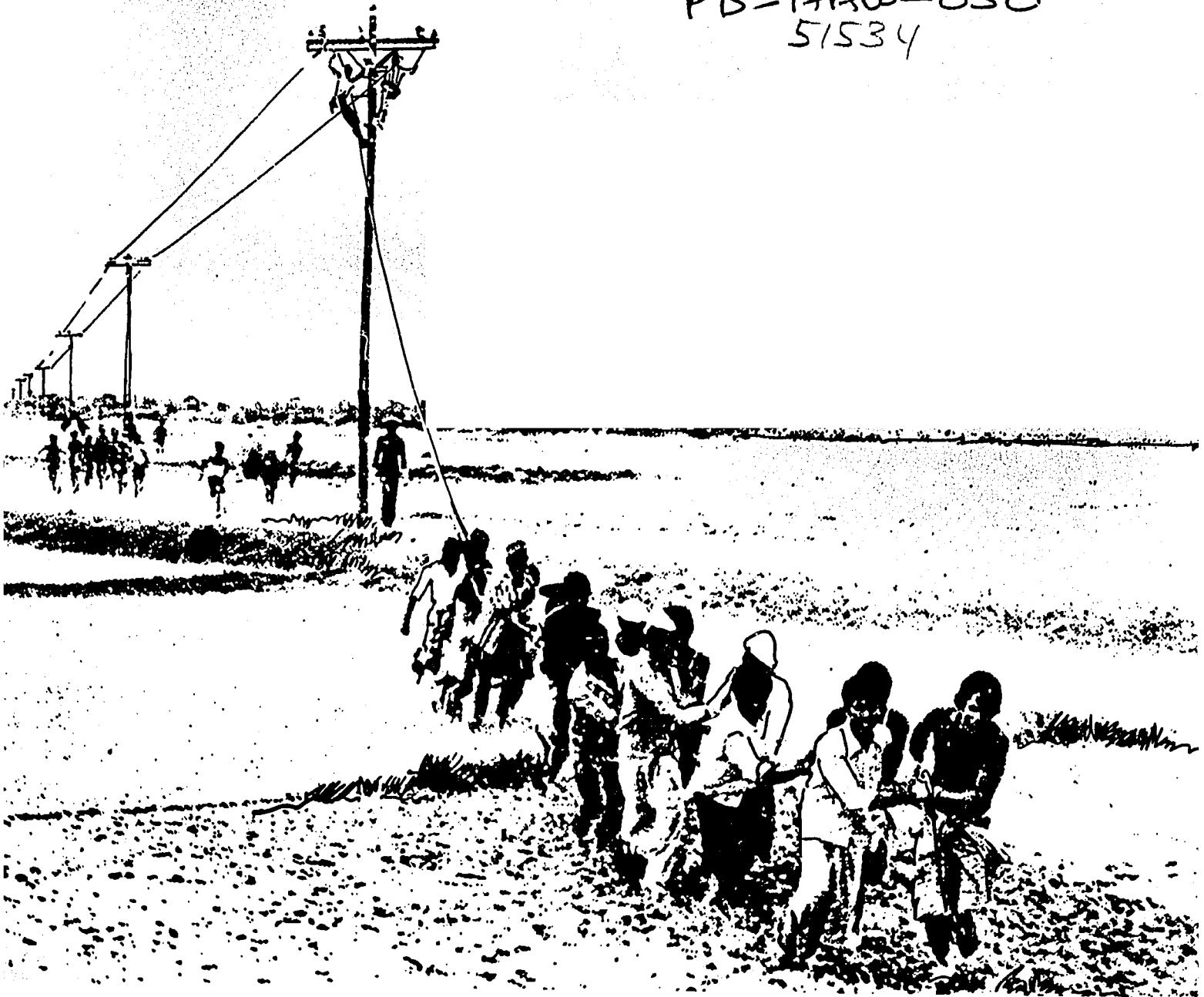


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# RURAL ELECTRIFICATION PROGRAMME BANGLADESH

THE FIRST FIVE YEARS  
1980-85



RURAL ELECTRIFICATION BOARD  
DHAKA, BANGLADESH  
SEPTEMBER, 1985

## FOREWORD

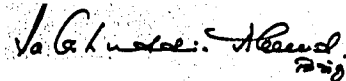
The Rural Electrification Board was created under the Rural Electrification Ordinance No. LI of 1977. The Board started its operations in early 1978. But the programme really took off on June 2, 1980 with the initial energization of the first PBS (Rural Electric Society) of the country, the Dhaka PBS-1.

1984-85 marks the fifth year of operation of the rural electric systems and therefore, provides good opportunity not only to evaluate the program for 1984-85 only but also of the last five years. In doing so the Report took the present shape and it was thought appropriate to name it "RE PROGRAM : BANGLADESH : THE FIRST FIVE YEARS (1980-85)."

There have been many doubts about success of the rural electrification programme in Bangladesh; specially its economic and conceptual aspects. I am glad to mention that any one going through this report will find that REB and the PBSs have by now been able to dispel many of the doubts.

The programme that began with a \$ 50 million support from the USAID, has by now grown to a multinational/multidonor supported programme involving the USAID, the World Bank, Kuwait, Asian Development Bank and Finland with a commitment of over \$ 280 million and GOB support for another \$ 132 million. Negotiations for additional supports are in the final stage with CIDA, USAID and other donors.

We hope that the long cherished desire of the rural mass to have an access to the blessings of the twentieth century's modern life through electrification will be fulfilled.



(Brig. Sabih uddin Ahmed)  
Chairman.

# RURAL ELECTRIFICATION BOARD

|                         |                         |
|-------------------------|-------------------------|
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## INDEX

| Subject  | Page No. |
|--|----------|
| 1. Brief History of Electrification .....                        | 1        |
| 2. Prospects of Rural Electrification .....                      | 2        |
| 3. Rural Electrification Programme .....                         | 7        |
| The First Five Years (1980-85)                                   |          |
| 3.1 On-Going Rural Electrification Projects .....                | 7        |
| 3.2 Annual Investments in Rural Electrification .....            | 7        |
| Programme (1980-85)  |          |
| 3.3 Rural Electrification and Traditional Rural Industries ..... | 16       |
| 3.4 Rural Electrification and Employment Generation .....        | 19       |
| 3.5 Institutional Development .....                              | 20       |
| 3.6 Instructions and Manuals .....                               | 21       |
| 3.7 System Design, Material Specifications .....                 | 23       |
| and Construction Standard  |          |
| 4. RE Activities during 1984-85 .....                            | 24       |
| 5. Financial Statement of the REB 1984-85 .....                  | 26       |
| <b>Charts &amp; Graphs</b>                                       |          |
| I. Line Construction (1980-85) .....                             | 8        |
| II. 33/11 KV Sub-Station Construction (1980-85) .....            | 9        |
| III. Annual Trend of Service Connections .....                   | 10       |
| IV. Rural Household Connections (1980-85) .....                  | 11       |
| V. Commercial Connections (1980-85) .....                        | 12       |
| VI. Electrification of irrigation Pumps .....                    | 13       |
| VII. Command Area Development/Annual Trend of production .....   | 14       |
| increases due to electrified irrigation                          |          |
| VIII. Industrial Connections (1980-85) .....                     | 15       |
| IX. Energy Consumption (1980-'85) .....                          | 17       |
| X. Fuel Savings .....  | 18       |
| XI. Consumer growth and Energy consumption .....                 | 25       |
| during 1984-85   |          |
| <b>Annexure</b>  |          |
| 1. Basic Characteristics of a typical PBS .....                  | 29       |
| 2. Organization chart of a typical PBS .....                     | 30       |
| 3. Organization chart of REB .....                               | 31       |

## BRIEF HISTORY OF ELECTRIFICATION

At the time of the partition of India in 1947, the area which then became East Pakistan (EP) was virtually without electricity, having a total electrical generating capacity of 21 MW and per capita electricity consumption of approximately .33 KWH per month. The EP Electricity Directorate existed as a coordinating and regulating agency, but with the exception of some minor facilities, it neither owned nor was directly involved in power generation. There was no power transmission at that time in the country, and virtually all load capacity consisted of captive facilities. The major aim of the initial 1950-60 EP power program therefore was directed toward the first step of securing generation capacity through nationalization of private power systems and incorporation of these systems into a national network. These actions were facilitated in 1960 when the Electricity Directorate was merged into the newly-created EP Water and Power Development Authority (WAPDA). This organization was created with authority for construction and operation of all power facilities—generation, transmission and distribution.

During Pakistan's Second Plan (1960-65) nationalization of the power system was completed through purchase of the remaining private utilities. WAPDA at the same time undertook expansion and improvement of the transmission and distribution facilities. While distribution investments were primarily channeled to industrial and agricultural development projects offering high economic returns, the Comilla Kotwali Pilot Rural Electrification Scheme was initiated at this time.

In 1964 the AID-financed Master Plan for Power

Development in East Pakistan was prepared by the International Engineering Company and this Plan generally provided the basis for the power recommendations of the then Third Plan (1965-70). At that point, while generation exceeded the capacity of transmission and distribution facilities to deliver power, much of the national system was still composed of scattered small supply systems. Expansion of distribution therefore was postponed in favour of development of a national generation and transmission grid.

Although Pakistan's Fourth Plan (1970-75) was formulated for the united country, the political changes following the independence of Bangladesh did not substantially alter the emphasis of power development for the country (Bangladesh) although the liberation war of 1971 did prevent or delay project implementation.

Thus the early 1970 power program was focussed on rehabilitation of war damaged facilities with the current "Total Electrification Program" initiated in 1975. The first stage of "Total Electrification", to be completed in 1978, primarily involved extension of the grid into every Thana in the country. With the completion of east-west inter-connector joining the two major sections of the grid, Bangladesh now has a sufficient transmission system capacity to support a national system. The "Total Electrification" concept however looks beyond the grid to development of the basic distribution facilities for effective delivery of power to all users in the rural areas.

# PROSPECTS OF RURAL ELECTRIFICATION

## Rural Employment

The distribution phase of Bangladesh's "Total Electrification Program" will take both time and large investment before it has major effect in the rural areas. A beginning is essential however if there is to be a prospect of achieving a basis for sustained rural development, a key to which is rural employment. In Bangladesh, putting to work at least some of the enormous surplus of unemployed rural poor is a condition to any concept of rural growth. Equally, the failure to do so will jeopardize the success of even the best of rural development efforts.

It is estimated that 40 percent, or 14 million of the 36 million people in the agricultural labour force, were unemployed. This represented an average of 215 unemployed or underemployed workers in each of Bangladesh's 65,000 villages. Given 1) the current estimate that nine million fifteen-year-olds will enter the Bangladesh labour force during the next decade, of whom approximately 93 percent will initially need employment in the rural sector, and 2) an optimistic growth rate in cereal production of 5.5 percent annually, it is estimated that unemployment in the agricultural sector alone will increase by a minimum of three million persons over the next decade, with a significant percentage of those able to find employment being seriously underemployed.

To place the issue in its immediate context, recent statistics suggest that up to 50 percent of the rural population may in fact be landless and that the percentage is increasing. Even if agricultural yields were to increase greatly, this trend may continue.

Thus, while fertile land is one of Bangladesh's greatest resources, expansion of HYVs alone will not be enough to offset the steady increase in population. Consequently almost one half of the rural population may soon be without either land or compensating employment unless employment opportunity is expanded through increased cropping or growth in rural non-farm production.

A number of Asian countries through adopting a rural employment policy have effectively utilized their expanding labour force to generate growth and improve income distribution. In Bangladesh where labour represents a greatly under utilized resource in a resource-scarce economy, the coming surge of young people entering the labour market could become a main force for development. If the opportunity however is not taken, the swelling ranks of the unemployed will instead become a major obstacle to development.

Since encouragement of rural employment can be the only acceptable alternative, what place does electrification have? Rural employment through electrification has been a major factor in the growth

and development of several modern Asian countries, most recently China, Korea and Taiwan. The priority accorded to rural electrification over alternative investments in the rural sector, e.g., transport, warehousing, medical facilities and even schools, has in each case been justified by accelerated development results. The results have particularly demonstrated the multiple employment effect of electrification through increased agricultural productive capacity, and agroprocessing and related small industry growth in market towns. That these results have not been achieved by electrification alone is obvious. While other conditions required are extensive and often complex, e.g., basic government support to the agricultural sector, availability of inputs and credit, and access to a fair market return, the point nonetheless remains that given concurrent development efforts and a labour force to exploit the opportunity, electrification becomes a primary force in the growth and accelerated development of rural economies through employment generation and the related growth of market towns.

## Import Substitution

A primary contribution of electricity to employment generation is the supply of heat, refrigeration, light, and concentrated power inputs essential to the most basic production processes and which cannot be supplied by human labour. Electricity also provides an inexpensive, clean and efficient substitute for other fuels. This is particularly important in Bangladesh where large in-country reserves of natural gas and hydro-power for generation of electricity can greatly reduce the dependence on oil imports and on increasingly scarce local wood supplies. Electrification, therefore, takes advantage of Bangladesh's natural resources and accordingly should be a necessary component to any long term development of a broad based self-sustaining rural economy.

## Rural Infra-structure

For Bangladesh, considering the continuing growth in demand for rural employment, the competitive advantage of urban producers, and the time required to establish a complete rural electrification system, the immediacy of the need is clear—Bangladesh should start now to provide electricity to the rural areas. This should be carried forward as an integral part of the Government's other efforts directed toward increasing production and securing growth in rural employment.

Specifically, increased irrigation capacity from electricity will promote second and third yearly crops, thereby providing employment opportunities to many of the large percentage of landless labourers who are now only employed at one time during the year. With an inexpensive, reliable power source, smaller agricultural processing units will become profitable and can therefore be located in rural areas.

This will first create jobs for landless labourers. It will also however reduce production losses of small farmers who can then dry their crops, increase the length of storage and sell at a better marketing time. Electricity will particularly make possible the growth of non-farm production units catering both to basic consumption needs of rural areas and even to external markets.

#### **Socio-economic benefits**

A second major benefit to the rural poor will be the improvement of education, health, family planning and local Government community facilities. Electrification of schools, of Union Health Centers and of other health and family planning clinics, of markets, Government offices and other common community areas will expand the reach of basic services available to the rural poor. Electricity will also facilitate a major improvement in communications for rural areas. Medical units, disaster reporting stations and other Government services will be able to use telephones. Radios, which often now lie idle because batteries are too expensive, can be better utilized. Television, as has already been demonstrated in several Bangladesh villages, can be used communally to provide an affordable means of education and entertainment.

#### **Communication**

The importance of electrification to nation building, through potential for improved communications and greater information flow, can hardly be understated. This extends not only to areas of political communication and awareness, but even more immediately to the potential for information in fields

of direct concern to rural communities, e.g., family planning, agricultural extension and basic preventive health and sanitary care. Similarly, electrification is almost a condition to improved educational opportunity within rural communities, both through communication from the outside and through activities which can then be generated within the communities themselves.

#### **Conclusion**

For the rural poor who cannot initially afford a domestic connection for electricity, all the above benefits will apply. In addition, for the large number of the poor who can, in-house lighting will increase opportunities for self employment and will provide better quality lighting at a cost cheaper than kerosene or other inferior sources of lighting.

Considering the above, and particularly the central role which rural employment must play in any successful effort toward development in Bangladesh, electrification is essential to any sustained rural development. In terms of energy sources, there is probably no effective alternative to electrification. Equally, there is no effective substitute for energy in terms of the requirements for accelerated development. Thus while all other necessary components of a rural development strategy must also be accorded priority—including inputs supply, credit, irrigation works, crop price support, extension services, transportation and road improvement programs—electrification needs to rank among the first as a major step toward full and equitable mobilization of rural productive capacity.

RURAL ELECTRIFICATION PROGRAMME  
BANGLADESH

THE FIRST FIVE YEARS

1980-85



The RE System in Bangladesh has just completed its first five years of operation in June, 1985. The first PBS (Rural Electric Society) of the country; the Dhaka PBS-1 was formally energized on June 2, 1980 with some 300 newly connected consumers. Since then, 32 PBSs have been registered with the Rural Electrification Board out of which 18 PBSs have formally been energized. Together, they were serving, as on June 30, 1985, nearly 3,00,000 households, 24,325 commercial shops, 5,910 irrigation pumps and 2,845 small and medium size rural industries.

The rural electrification programme began in 1978 with \$ 50 million financial assistance from

the USAID and \$ 29 million (Tk. 440 million at 1978 exchange rate) local currency support from the Government of Bangladesh. As on June 30, 1985, the programme had a committed investment programme of Tk. 6500 million with a foreign exchange commitment of US \$ 205 million from the USAID (US \$ 120 million), the World Bank (US \$ 40 million), KFAED (US \$ 29 million), Asian Development Bank (US \$ 10 million) and the Govt. of Finland (US \$ 6 million). The GOB commitment to programme stood at Tk. 2440 million. The programme has under implementation 5 (five) Area Coverage Rural Electrification Projects, that envisage development of 33 PBSs in the country covering a geographical area of 14,000 sq. miles or approximately one-fourth of the country's total area.

#### ON-GOING RURAL ELECTRIFICATION PROJECTS

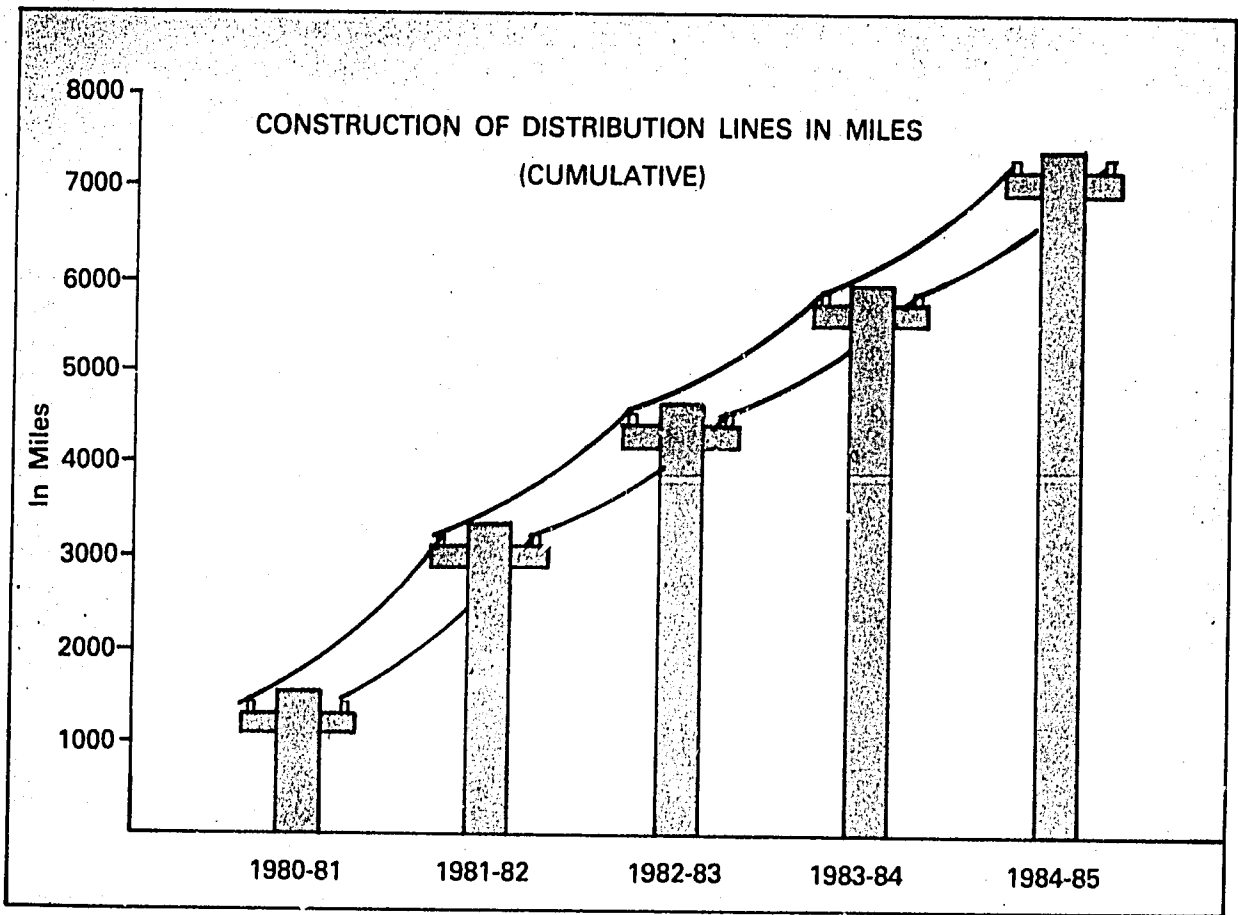
| Name of the Project                           | Estimated Project Cost (F. E.)<br>Tk. in million | No. of PBS | Area in Sq. Miles | Initial Connection Target (Meters) |
|---|--|------------|-------------------|------------------------------------|
| ACRE-Phase-I                                  | 2132<br>(1286)                                   | 13         | 5,942             | 2,20,832                           |
| ACRE-Phase-I Extension                        | 730<br>(434)                                     | 8          | 3,072             | 1,19,990                           |
| ACRE-Phase-II-A                               | 1457<br>(909)                                    | 5          | 2,137             | 65,351                             |
| ACRE-Phase-II-B                               | 1635<br>(948)                                    | 7          | 2,807             | 91,056                             |
| Extension of Mymensingh PBS-I & Tangail PBS-I | 235<br>(173)                                     |            | 220               | 4,050                              |
| <b>Total :</b>                                | <b>6189<br/>(3750)</b>                           | <b>33</b>  | <b>14,184</b>     | <b>5,01,279</b>                    |

ACRE : Area Coverage Rural Electrification.

#### ANNUAL INVESTMENT IN RURAL ELECTRIFICATION PROGRAMME (1980-85)

in Million Taka

| Financial Year | Local Currency | Foreign Exchange | Total       |
|----------------|----------------|------------------|-------------|
| 1980-81        | 159            | 218              | 377         |
| 1981-82        | 169            | 154              | 323         |
| 1982-83        | 211            | 340              | 551         |
| 1983-84        | 244            | 304              | 548         |
| 1984-85        | 217            | 1069             | 1286        |
| <b>Total :</b> | <b>1000</b>    | <b>2085</b>      | <b>3085</b> |

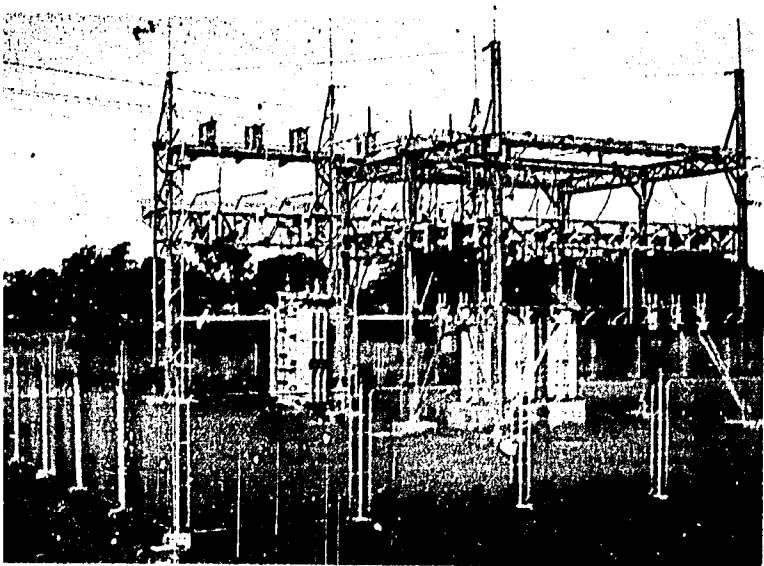
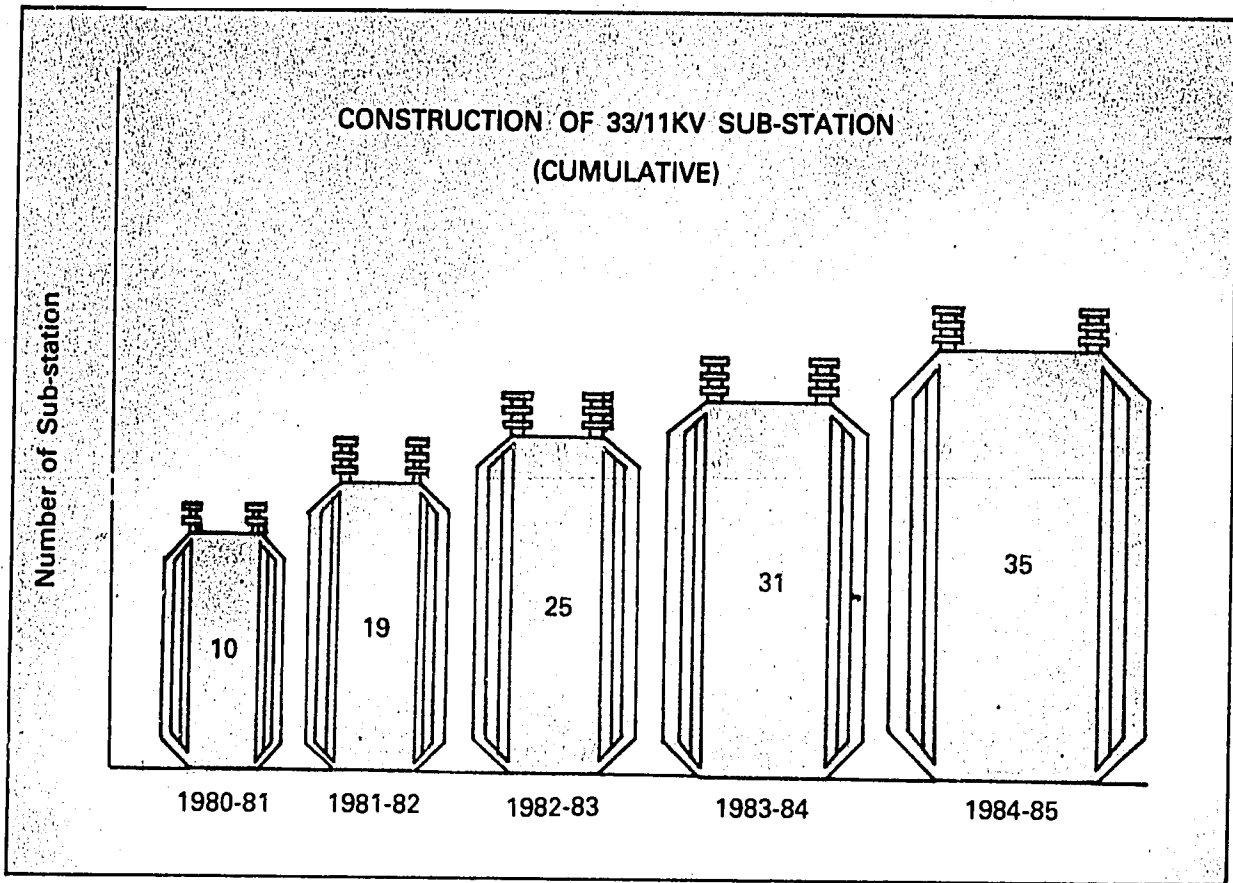


**Line Construction (1980-85)**

| FY             | Poles erected       | Transformers installed | Lines completed |
|----------------|---------------------|------------------------|-----------------|
| 1980-81        | 36,000 Nos.         | 5392 Nos.              | 1500 miles      |
| 1981-82        | 42,720 Nos.         | 6397 Nos.              | 1780 "          |
| 1982-83        | 29,304 Nos.         | 4388 Nos.              | 1221 "          |
| 1983-84        | 30,432 Nos.         | 4557 Nos.              | 1268 "          |
| 1984-85        | 36,000 Nos.         | 5392 Nos.              | 1500 "          |
| <b>Total :</b> | <b>174,456 Nos.</b> | <b>26,126 Nos.</b>     | <b>7269 "</b>   |

A rural distribution line in operation

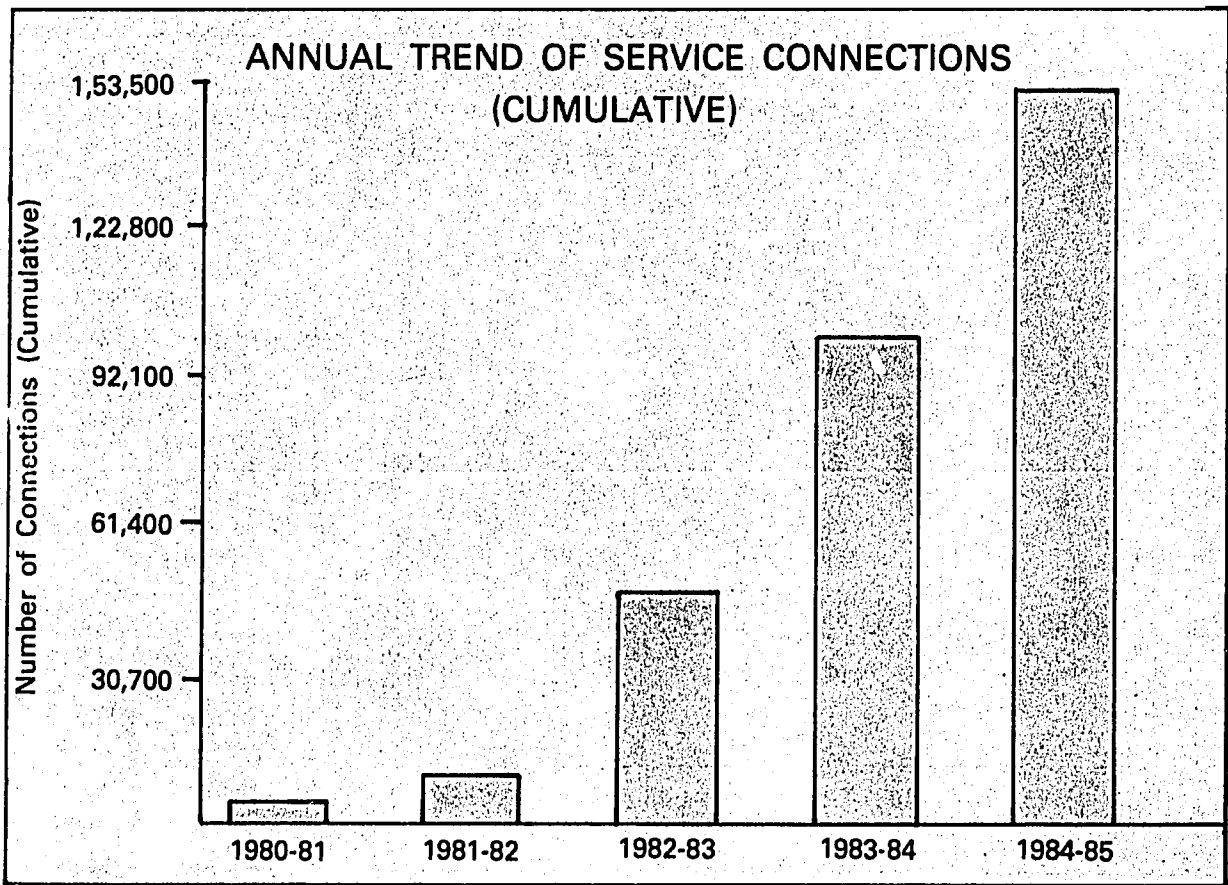




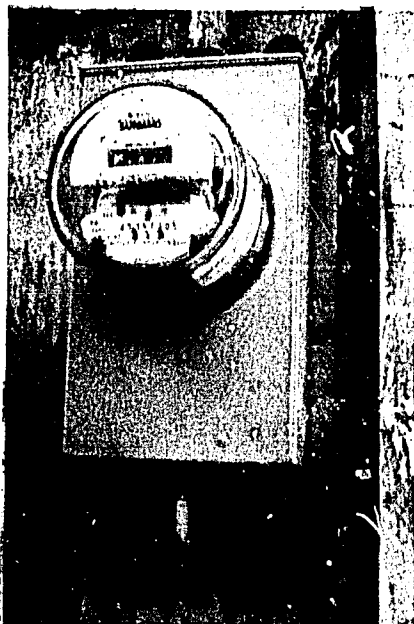
A 33/11 KV Sub-Station in operation

### INSTALLATION OF 33/11 KV SUB-STATIONS (1980-85)

| FY             | Nos. of 33/11KV<br>S/S commissioned |
|----------------|-------------------------------------|
| 1980-81        | 10 Nos.                             |
| 1981-82        | 9 Nos.                              |
| 1982-83        | 6 Nos.                              |
| 1983-84        | 6 Nos.                              |
| 1984-85        | 4 Nos.                              |
| <b>Total :</b> | <b>35 Nos.</b>                      |



The PBSs meter every consumer and to facilitate easy reading as well as regular check-ups, weather proof outdoor meters have been introduced for the first time in the country.

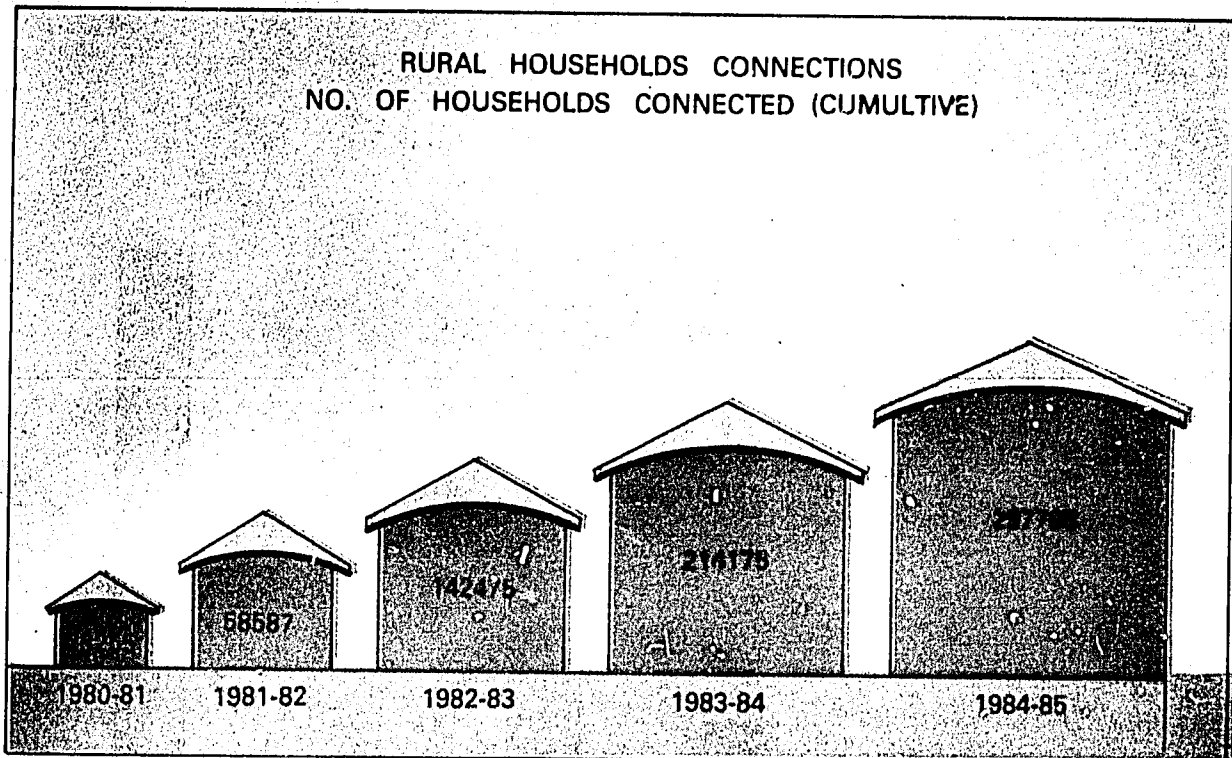


A typical three phase meter

#### Annual installation of meters

| <u>FY</u>      | <u>Res</u>    | <u>Com</u>   | <u>Irr.</u> | <u>Inds.</u> | <u>Others</u> | <u>Total</u>  |
|----------------|---------------|--------------|-------------|--------------|---------------|---------------|
| 1980-81        | 9302          | 1451         | 76          | 160          | 136           | 11125         |
| 1981-82        | 14133         | 2364         | 391         | 228          | 83            | 17199         |
| 1982-83        | 33395         | 4898         | 1544        | 652          | 134           | 39833         |
| 1983-84        | 28840         | 7448         | 1847        | 935          | 474           | 40334         |
| 1984-85        | 33448         | 8164         | 2052        | 870          | 672           | 45206         |
| <b>Total :</b> | <b>119118</b> | <b>24325</b> | <b>5910</b> | <b>2845</b>  | <b>1499</b>   | <b>153697</b> |

**RURAL HOUSE HOLDS CONNECTED  
(1980-85)**

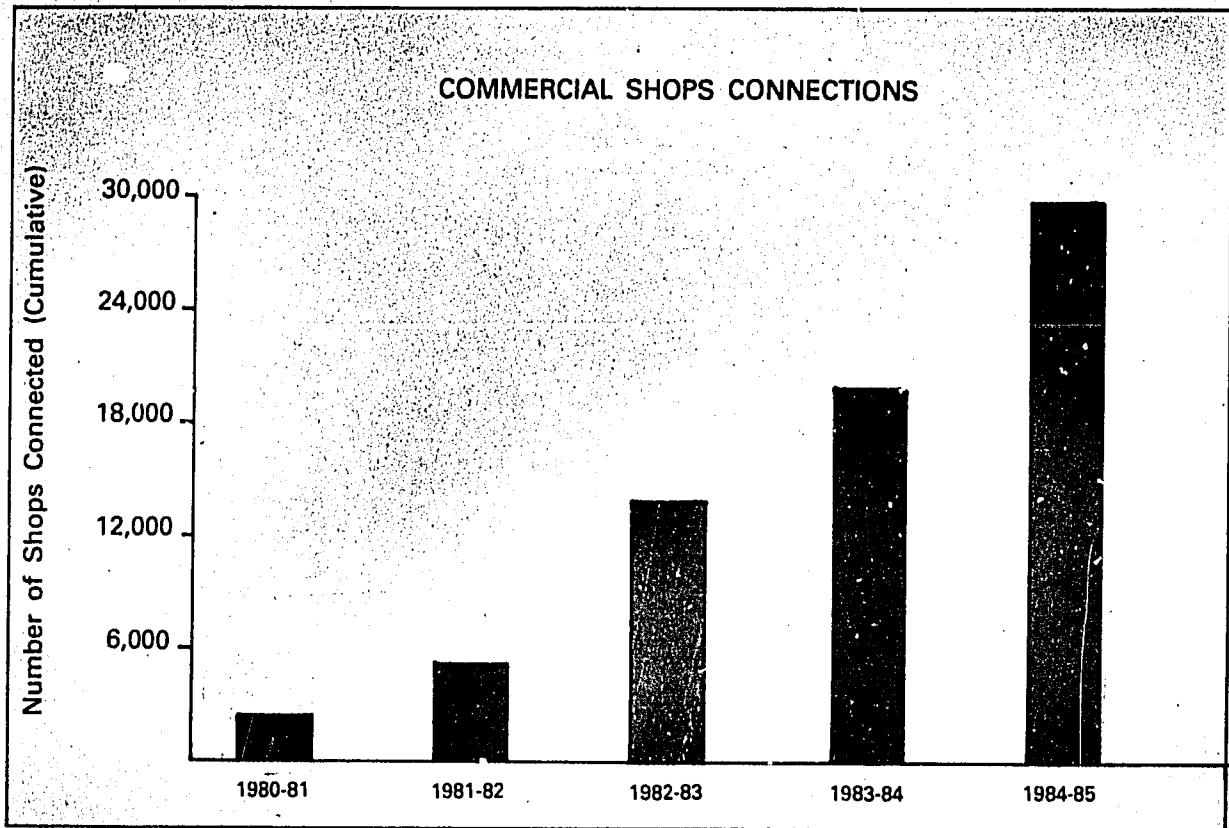


To economise cost of service connections as well as to relieve many poor rural families from the burden of minimum charges, provisions have been made to connect more than one family through one domestic meter. A recent survey indicates that on average at least 2.5 families per meter are directly having the benefit of electricity at their dwelling houses. About, 3,00,000 rural families have electricity.



A typical rural homestead recently electrified. USAID Impact Study (1983) notes that electricity has greatly enhanced the spirit of education among rural children.

**COMMERCIAL SHOPS CONNECTED  
(1980-85)**



Electrification of Commercial Centres and shops have not only facilitated addition of modern electronics and their uses in trade and commerce but also extended transaction hours deep into midnights. Volume of business increases too; as the income of electrified rural areas goes up.

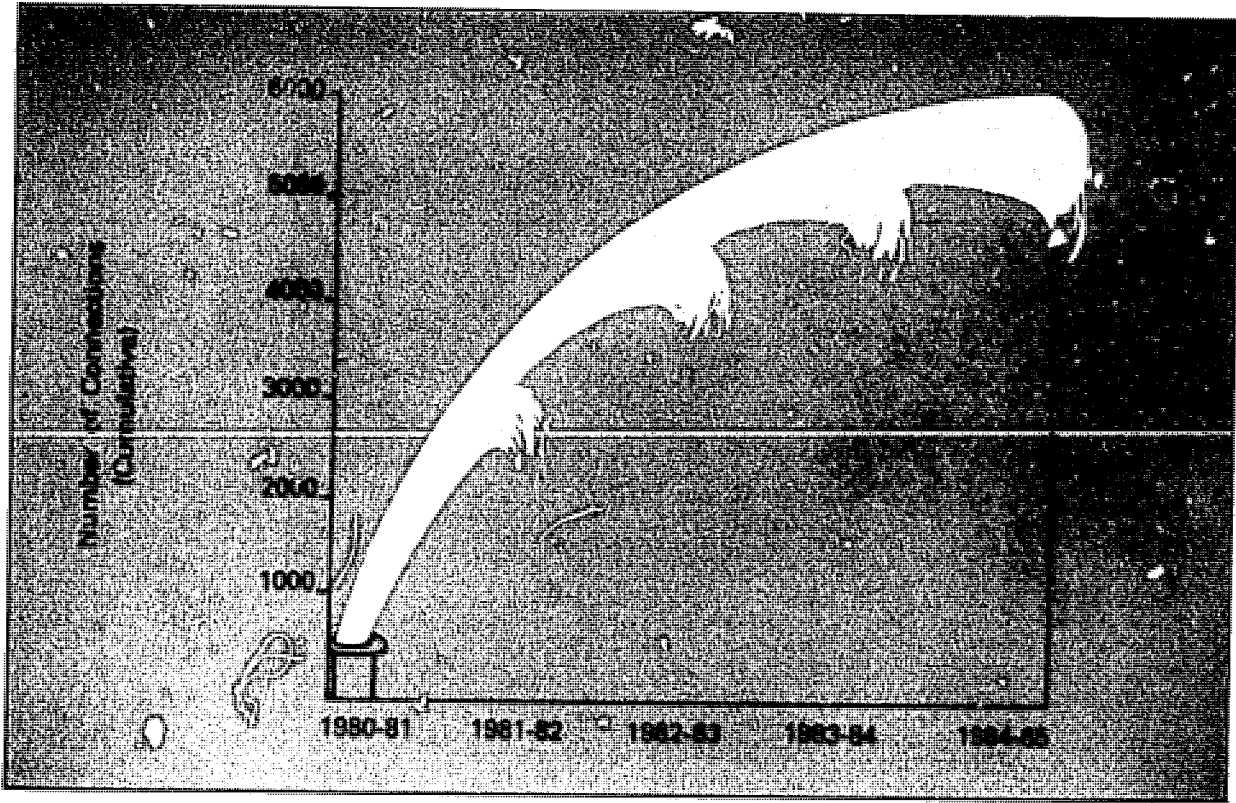


An electrified rural market place. Electrification has extended business hours upto at least ten O'clock in the night.

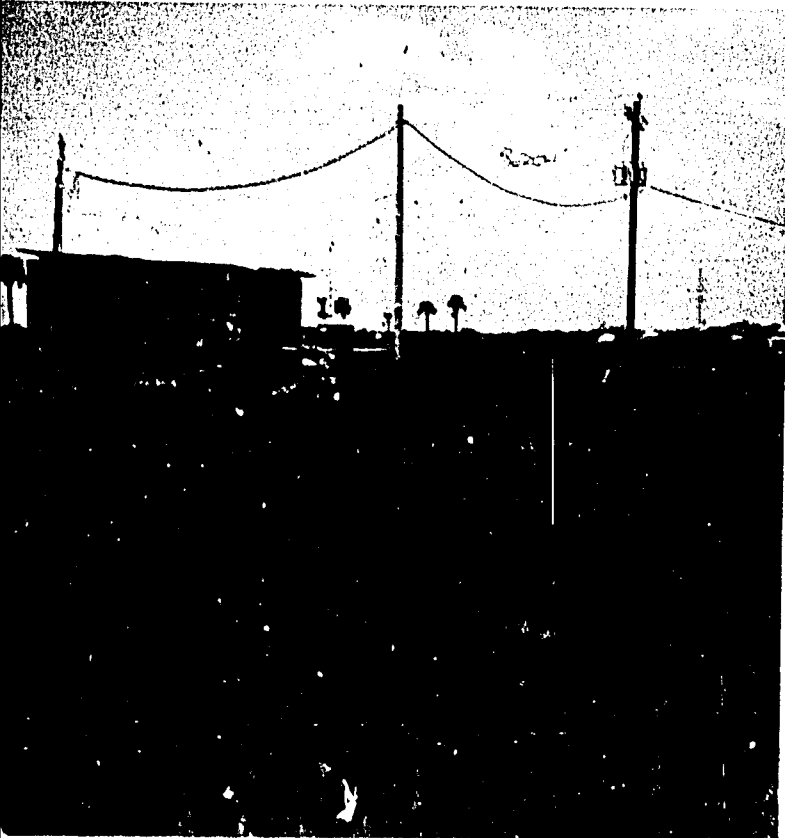


An ice-cream Factory provides new delicacy to the rural children in a summer day.

ELECTRIFICATION OF IRRIGATION CONNECTION  
ANNUAL TREND OF SERVICE CONNECTION



In 1980, it was presumed by planners that some 3000 irrigation pumps could be electrified by June, 1985. But the facts in the field proved otherwise. Some 5910 irrigation pumps have already been electrified by June 30, 1985 and by the time the Phase-I Project is completed some 7000 pumps are expected to be connected to the RE Systems — more than double the presumed figures.

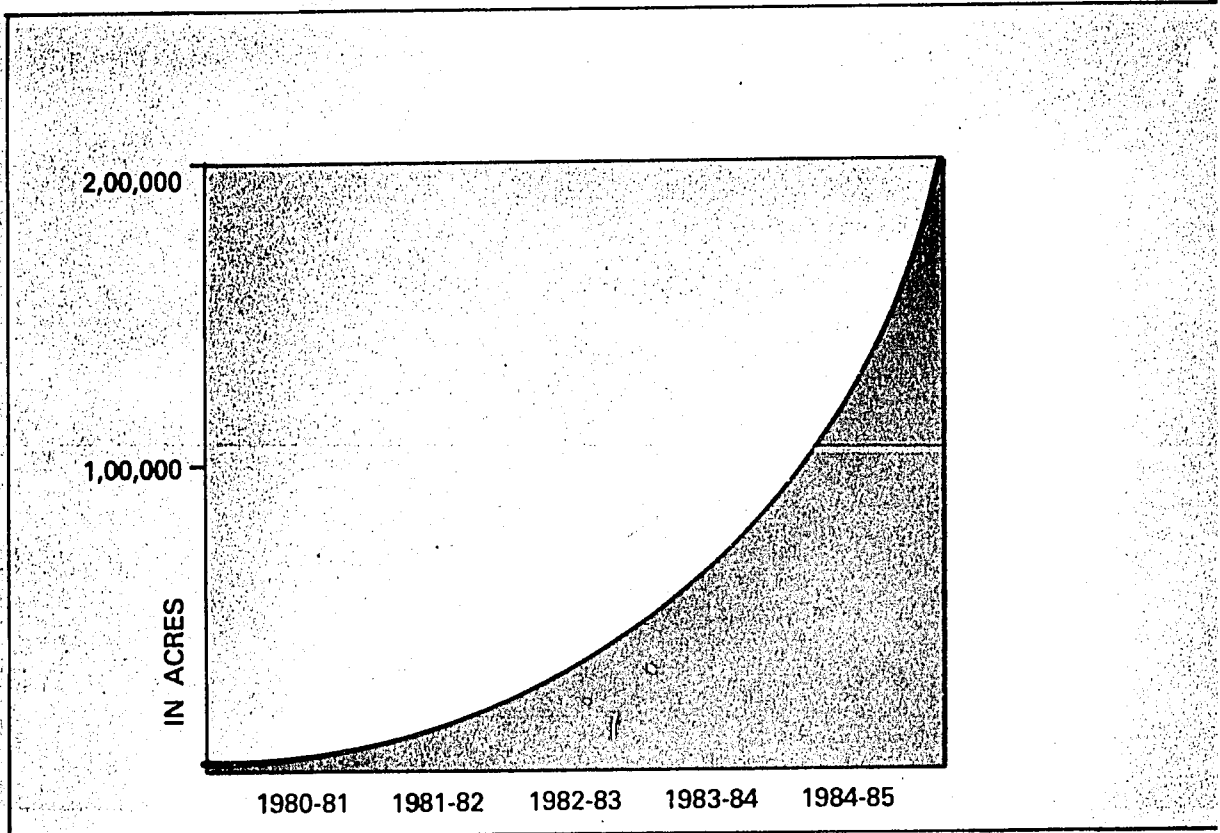


A deep tube well irrigating paddy field.

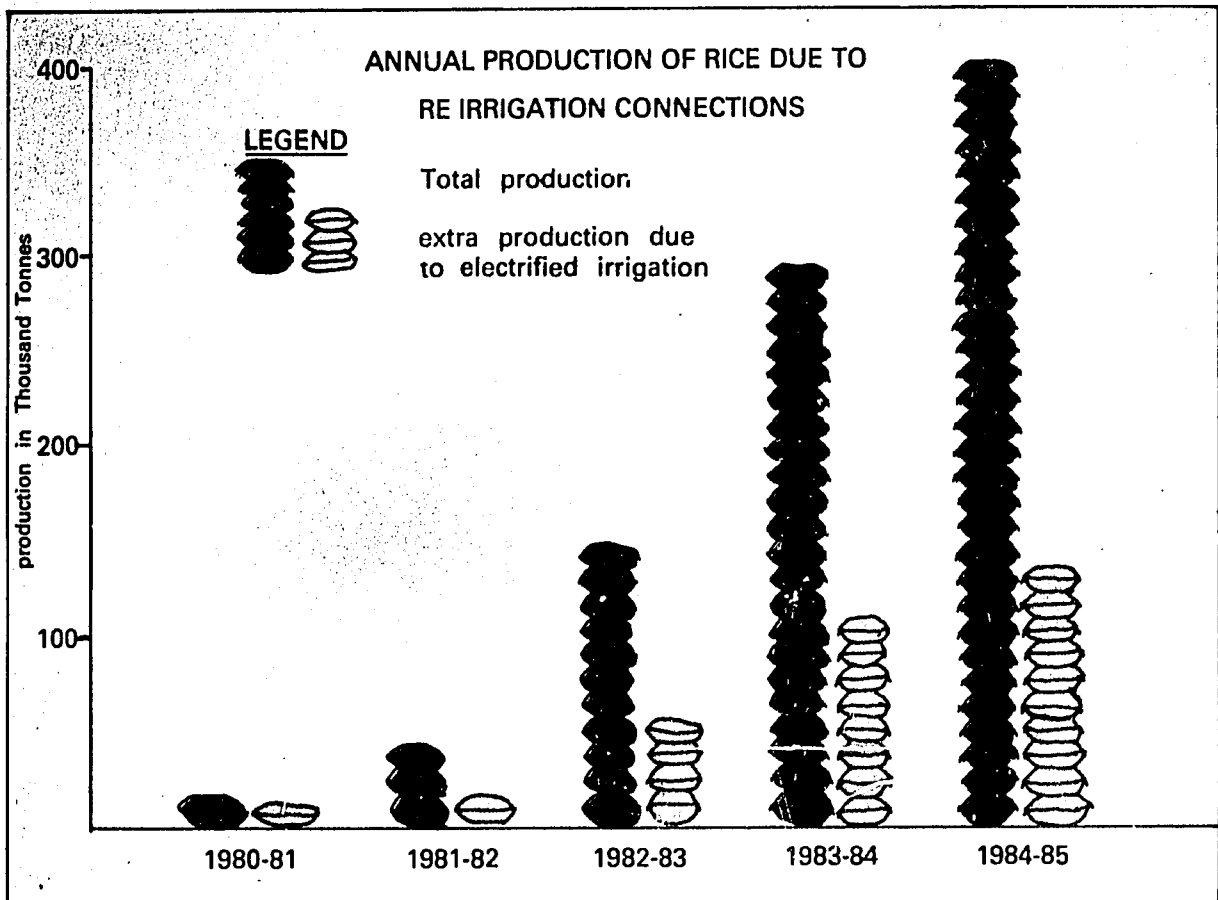
Annual Pump Connections

| FY      | DTW  | STW  | LLP | Total |
|---------|------|------|-----|-------|
| 1980-81 | 19   | 47   | 10  | 76    |
| 1981-82 | 93   | 252  | 46  | 391   |
| 1982-83 | 330  | 1008 | 206 | 1544  |
| 1983-84 | 330  | 1239 | 278 | 1847  |
| 1984-85 | 292  | 1414 | 346 | 2052  |
| Total   | 1064 | 3960 | 886 | 5910  |

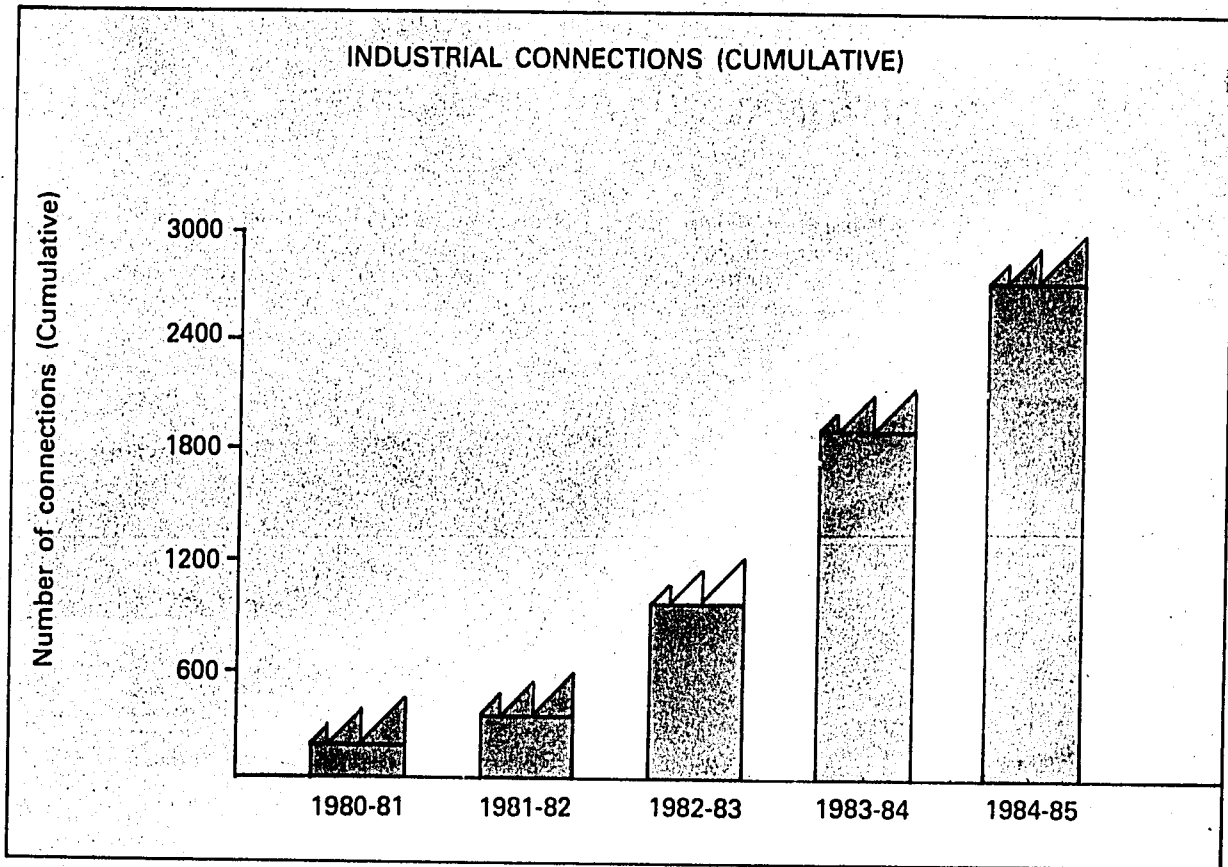
**RURAL ELECTRIFICATION AND AGRICULTURE  
SOME IMPACTS RECORDED DURING 1980-85**



**RICE PRODUCTION IN RE IRRIGATED AREA  
(1980-85)**







One of the outstanding achievements during the initial years of the rural electrification programme in Bangladesh is the faster than presumed growth of rural industries. As early as 1980, it was presumed that some 905 small and medium size industries may ask for electricity by end of June, 1985 and their total energy consumption during that FY would be approximately 32,000 Mwh. In fact by June 30, 1985 some 2,845 industries were connected by 18 energized PBSs and their total consumption during 1984-85 was 70104 Mwh. 50% of the total energy consumed in the rural distribution systems.



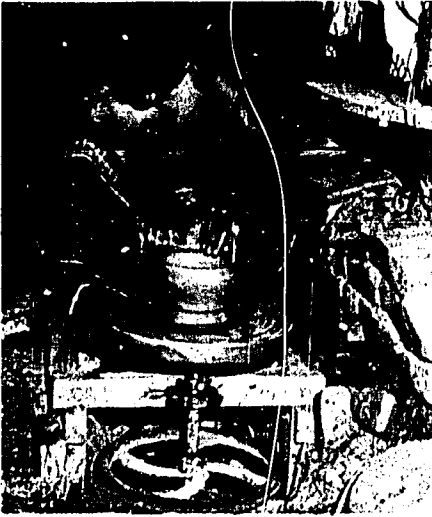
A typical rural industry served by a PBS.

**Rural Industrial Consumption  
(1980-85)**

| FY      | Total consumption (Mwh) | Industrial consumption (Mwh) | % of industrial consumption |
|---------|-------------------------|------------------------------|-----------------------------|
| 1980-81 | 5,006                   | 2,051                        | 41%                         |
| 1981-82 | 12,981                  | 5,712                        | 44%                         |
| 1982-83 | 44,587                  | 20,493                       | 46%                         |
| 1983-84 | 87,776                  | 40,966                       | 47%                         |
| 1984-85 | 141,626                 | 70,104                       | 50%                         |

## RURAL ELECTRIFICATION AND TRADITIONAL RURAL INDUSTRIES

The Power Use Division of the Rural Electrification Board makes relentless efforts to advise, educate and motivate the traditional artisans of the country to make good use of the opportunities of electric power availability to improve both quality and quantity of their artifacts. A good many artisans availed the opportunity and thus found a way to revitalize the dying traditional cottage industries in the face of so far irresistible competition from the mechanized industrial sectors.

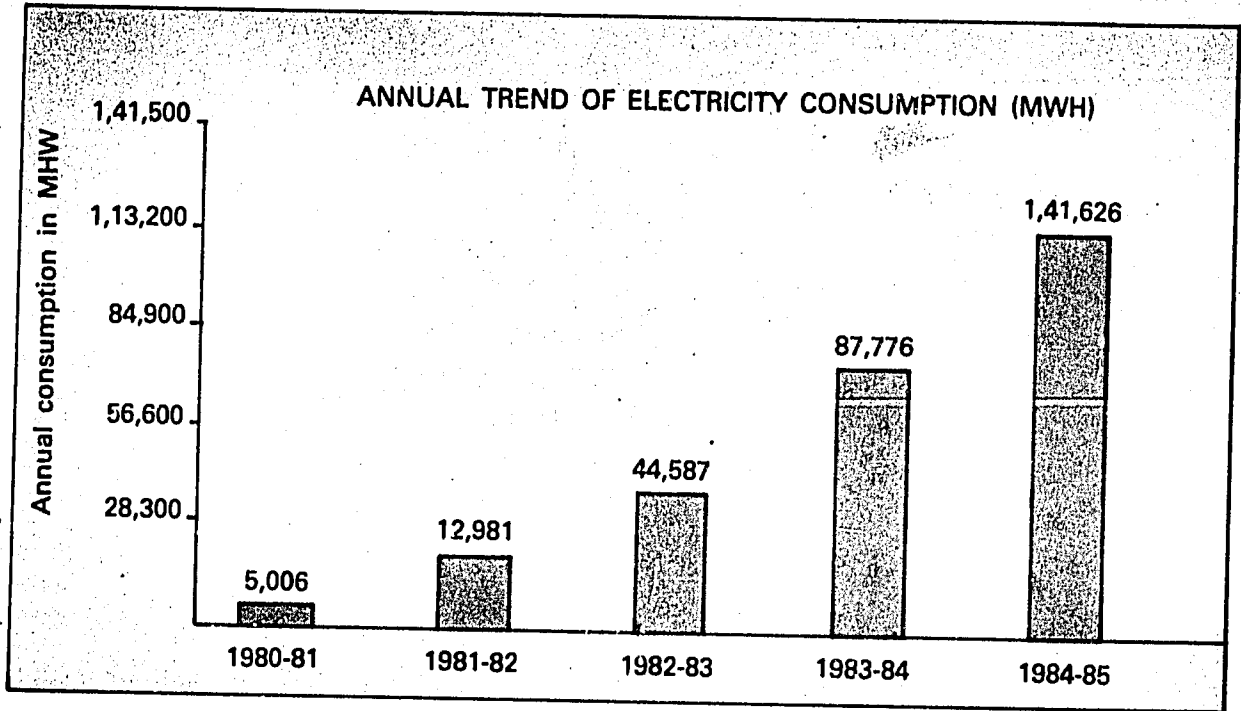


A potter's wheel run by a single phase small electric motor : works made easy and quality made better

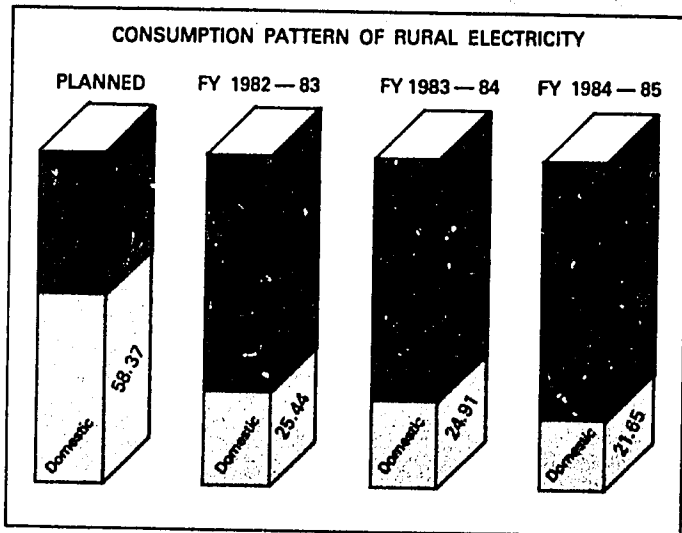


Handloom : Better light and longer working hours.

**ENERGY CONSUMPTION (1980 — 85)**



**Consumption Pattern of Rural Electricity**



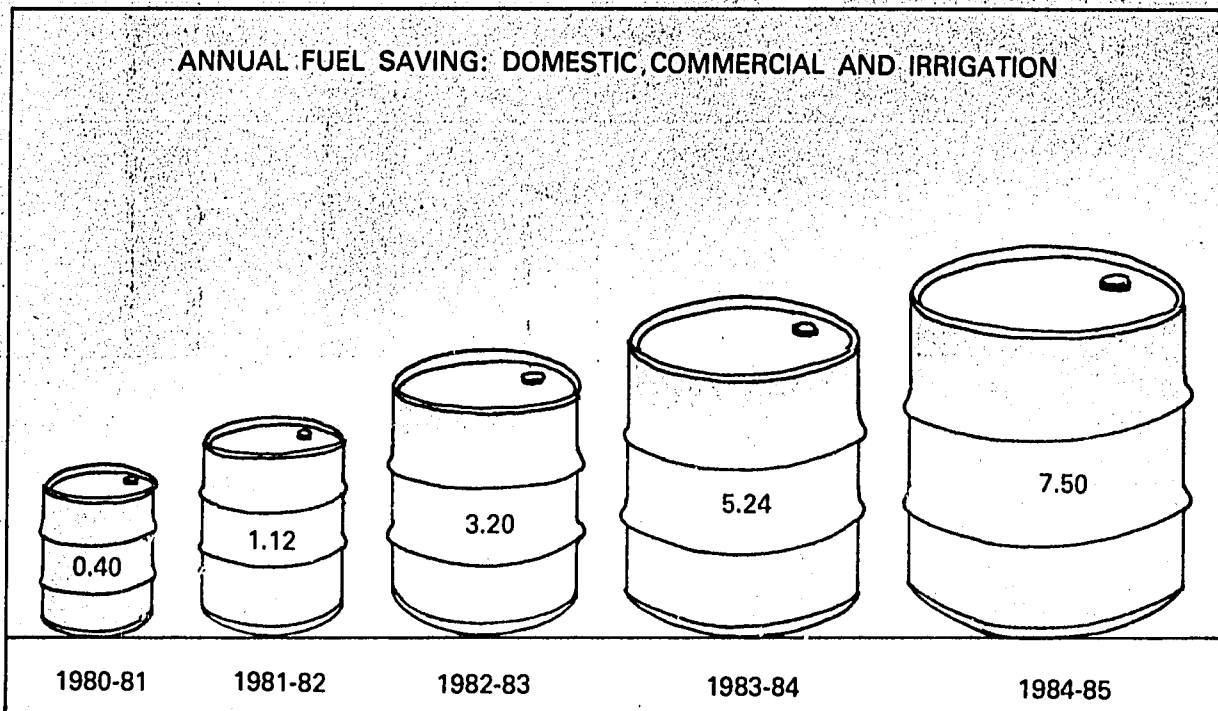
**Annual Average Consumption per Meter**

| FY      | Average Consumption per Meter (Kwh) | % increase over base year |
|---------|-------------------------------------|---------------------------|
| 1980-81 | 449                                 | —                         |
| 1981-82 | 458                                 | 2%                        |
| 1982-83 | 654                                 | 45%                       |
| 1983-84 | 809                                 | 80%                       |
| 1984-85 | 922                                 | 105%                      |

**STATISTICS ON FUEL SAVINGS DUE TO  
RURAL ELECTRIFICATION (1980-85)**

**GRAPH SHOWING QUANTITY OF FUEL SAVED  
(1980-85)**

(FIGURES IN MILLION GALLON)



**YEARWISE QUANTITY AND VALUE OF FUEL  
SAVED (1980-85)**

| FY                  | Fuel Saved (in Gallons) |          | Value of both at<br>1985 CIF prices   |
|---------------------|-------------------------|----------|---------------------------------------|
|                     | Diesel                  | Kerosene |                                       |
| 1980-81             | 40916                   | 357194   | Tk. 12256917                          |
| 1981-82             | 245435                  | 903122   | Tk. 34478681                          |
| 1982-83             | 1023758                 | 2179222  | Tk. 93799227                          |
| 1983-84             | 1901012                 | 3345657  | Tk. 152096061                         |
| 1984-85             | 2813842                 | 4688983  | Tk. 216839063                         |
| Total—<br>(1980-85) | 6024963                 | 11474178 | Tk. 509469949<br>(Tk. 509.46 million) |

## RURAL ELECTRIFICATION AND EMPLOYMENT GENERATION (1980-85)

One of the objectives of rural electrification programme in Bangladesh is to generate employment opportunities in the rural areas. Rural electrification being a major infra-structure development project contribute in both direct and indirect employment creation. The direct employment includes all personnel skilled and unskilled that become engaged in implementation of the programme from planning and drawing board works through execution and operation of the rural electrification system. Indirect employment generations are identified with the forward and backward linkage effects of the programme on other sectors of the economy. Employment generations through 'forward linkage effects' result from enhanced agricultural and industrial activities due to the RE programme. Employment generations in those industries and enterprise that supply construction materials for the RE programme can be attributed to the programme as it's backward linkage effects. During the five year (1980-85) period, the programme has created an estimated. 8515 job opportunities.



A garment industry in Dhaka PBS-1 Opening new horizon of employment for rural womenfolk

### Direct job opportunities created during 1980-85

(Figures in Numbers)

| Profession           | Job opportunities created |             |             |             |             | Total       |
|----------------------|---------------------------|-------------|-------------|-------------|-------------|-------------|
|                      | REB                       | PBS         | Consultants | Contractors | Others      |             |
| Tech. Professional   | 189                       | 114         | 210         | 1500        | —           | 2013        |
| Gen. Professional    | 165                       | 243         | 63          | 100         | —           | 571         |
| Skilled Workers      | 75                        | 707         | —           | —           | 4000        | 4782        |
| Semi-Skilled Workers | 192                       | 536         | 21          | 400         | —           | 1149        |
| <b>Total :</b>       | <b>621</b>                | <b>1600</b> | <b>294</b>  | <b>2000</b> | <b>4000</b> | <b>8515</b> |

NB : Others include village electricians, plumbers etc.

Apart from these direct employment generations, electrification of 5910 irrigation pumps and 2845 industrial units has resulted in the creation of 694,769 indirect job opportunities in the rural areas, according to an estimate based on a recent field survey. The survey also revealed that 5910 electrified pumps has a total command area of 215,897 acres. Each acre of irrigated land creates job opportunity for three workers. Therefore, 647,691 employment opportunities have been created in agricultural sector alone. In another estimate made from the survey on industrial units served by the RE systems, it is found, that on average, 16.55 employees work per industry. This gives a total employment of 47,084 persons in 2845 industries established due to rural electrification programme.

Employment opportunities of significantly large numbers have also been created as backward linkage effects in the local enterprises and industries supplying construction materials for the RE programme, which have not been estimated here.



A village electrician on the job. Some 4000 rural youths are working in the PBSs as free lance village electrician.

## INSTITUTIONAL DEVELOPMENT

An institution is the foundation of any programme or business it implements or operates. Success or failure of the programme, or of the business greatly depends on the strength or weaknesses of its institution. Experience in this country indicates that programmes fail due to multifarious weaknesses of the institutions entrusted to implement them. Important among them are (i) inexperienced manpower handling the programmes (ii) highly centralised administrative systems (iii) non-involvement of the beneficiaries in the implementation (and operation there after) of the programme (iv) inadequate emoluments and other essential facilities provided to the workers (which are often below minimum level) (v) lack of in-built reward or incentives for workers in the system (vi) tendency to have unnecessarily bigger size of the establishment and above all, lack of managerial background of the nation as whole.

The Rural Electrification Board, since its inception has been making ceaseless efforts to overcome the weaknesses outlined above. To develop skilled and experienced manpower in REB and the PBSs, the Board has been particularly selective about basic qualification of the recruits and their appropriate training before being assigned to their respective jobs. For example; for the position of linemen, minimum qualification required for entry into services as trainees is 2nd. Div. Secondary School Certificate. Each recruit undergoes a basic Part-I Lineman training course for six months. On successful completion of the course they are absorbed in the PBSs as Asstt. Linemen on Master Roll basis for a period of 2 years. During this period many of them work under the construction contractors to gain on the job experience. After 2 year, they are required to successfully complete Lineman basic Part-II training course to become Asstt. Lineman on regular basis. Again after 2 years of regular services, they are required to successfully complete Lineman Part-III training course to become eligible for appointment as linemen. Similar training courses are conducted for all technical, managerial and finance personnel in REB and the PBSs.

To decentralize the administration and at the same time to ensure direct participation of the beneficiaries of the programme, REB has introduced the co-operative concept of rural electrification in Bangladesh through establishment of PBS (Rural Electric Society). A PBS is neither state owned nor a private owned institution. It is owned by member-consumers which is a unique feature in Bangladesh context. Each PBS has a Board of Directors elected by the member-consumers, who are responsible for formulation of all policies relating to the management of the PBS systems. The day-to-day business of the PBS is looked after by a General Manager who enjoys absolute authority to decide the carrier performance of all other PBS Staff. Even the Board of Directors cannot interfere in his day-to-day administration. The PBS enjoy complete economic autonomy.

The PBSs are the independent organs which play vital role in the successful operation of the RE Systems. To hold experienced and adequately skilled personnel in the PBSs adequate in-built rewards and incentives have been incorporated in the emoluments and service benefits of the PBS staff which is basically performance based modern method of wage fixation. It may be noted here that no two PBS has the same wage structure.

Since inception, adequate care has been taken to limit the numbers of personnel within the absolute necessity both in REB and the PBSs. REB has been built as an officer based organization. Positions like clerks and assistants have been carefully sorted out; instead, the typists in addition to their basic responsibility do the little clerical jobs necessary in the offices. One Directorate has only one number of peon. Similarly, a PBS serving above 14,000 consumers have less than 100 employees and for all of them, again only one peon who also acts as runner of the office. In fact, efforts have been made to model both REB and PBS organograms in line with modern practices of the developed countries.

To avoid unnecessary departmental involvement in construction works, REB preferred engagement of local engineering (consulting) firms for survey, design and supervision of construction works. Each PBS pays between Tk. 4 and 6 million to the local consultants for these purposes, which is one of highest quantum figure in a single project. Besides, the PBSs after completion of initial infrastructure engage consultants as retainers to advise on their day-to-day technical problems and supervise expansion works. All sorts of construction works are carried out by contractors. People working under both consultants and the contractors are trained by REB, and they are required to maintain minimum numbers of qualified employees as per REB standard.

At present 8 (eight) local engineering (electrical) consulting firm having a contingent of 294 employees and 52 (fifty) two construction contractors with about 2000 workers are working for the programme.

### Discipline

To maintain dynamism of the institution, both REB and the PBSs side by side with motivation, rewards and incentives provided to the employees, follow strict discipline to sort out corrupt, inefficient and undesirable (persons having misconduct) personnel. This could not be done easily. Heavy prices had to be paid to achieve this high standard of discipline. Among several categories of staff, some 27 numbers of class-I officers of REB and 31 numbers of class-I officers of the PBSs have been removed from services during the last five years. It reflects that no compromise has been made with indiscipline, corruption and level of inefficiency.

## INSTRUCTIONS AND MANUALS

The Rural Electrification Board has developed a number of Instructions and Manuals required for management, operation and maintenance of the PBS Systems. There is virtually no area on management, operation and maintenance for which necessary Manuals and Instructions have not been introduced. REB has also introduced uniform system of accounts for all the PBS with a view to standardization of accounts and audit procedures.

## TRAINING BY REB.

To meet the demand for local training needs the Rural Electrification Board has established since its inception a Training Institute, where Senior Officers of REB advised and assisted by expatriate consultants conduct all sorts of training, technical, financial and management. No body in REB or in the PBS is put to work without appropriate training.



Newly recruited educated rural youths being trained as Line men.

**List of persons trained by the Training Institute of Rural Electrification Board during 1980-85.**

| Profession  | Number of person trained |             |             |             |            |             |
|---|--------------------------|-------------|-------------|-------------|------------|-------------|
|   | REB                      | PBS         | Consultants | Contractors | Others     | Total       |
| Dy. Director  | 25                       |             |             |             |            | 25          |
| Executive Engineer  | 25                       |             |             |             |            | 25          |
| General Manager   |                          | 34          |             |             |            | 34          |
| Asstt. Director   | 103                      |             |             |             |            | 103         |
| Asstt. Engineer   | 127                      |             |             |             |            | 127         |
| Board Director  |                          | 318         |             |             |            | 318         |
| Accountants (PBS)   |                          | 70          |             |             |            | 70          |
| Sub-Asstt. Engineer   | 37                       |             |             |             |            | 37          |
| Wiring Co-ordinator, Wiring Inspector                           |                          | 110         |             |             |            | 110         |
| Line man  |                          | 386         |             |             |            | 386         |
| Line Supervisor   |                          | 48          |             |             |            | 48          |
| Billing Supervisor  |                          | 78          |             |             |            | 78          |
| Consultant's Engineer   |                          |             | 59          |             |            | 59          |
| Consultant's Inspectors   |                          |             | 60          |             |            | 60          |
| Contractor's Supervisors  |                          |             |             | 431         |            | 431         |
| Accountant (REB)  | 37                       |             |             |             |            | 37          |
| Store Keeper (REB)  | 10                       |             |             |             |            | 10          |
| Store Keeper (PBS)  |                          | 26          |             |             |            | 26          |
| Asstt. General Manager  |                          | 184         |             |             |            | 184         |
| Inspector (REB)   | 65                       |             |             |             |            | 65          |
| Sr. Engineers of PDB, GEM Plant & Planning Commission Officials |                          |             |             |             | 81         | 81          |
| Others  |                          |             |             |             | 239        | 239         |
| <b>Total :</b>  | <b>429</b>               | <b>1254</b> | <b>119</b>  | <b>431</b>  | <b>320</b> | <b>2553</b> |

## TRAINING BY THE PBS

Besides the Training Institute of the Board, individual PBS also undertakes special training programmes to create technicians and educate member-consumers on various aspects of the uses of electricity. Among them are (i) the village adviser training programmes (ii) pump operators training programmes and (iii) village electricians training courses, etc.

Village Advisers are the people who volunteer themselves to work for the smooth implementation and proper maintenance of the RE Systems of their respective PBS. The Advisers are regularly oriented by the PBS staff about execution and maintenance of right-of-way; safety uses of electricity, vigilance against theft of PBS properties and pilferage of power. They, in turn, regularly brief the general consumer-members on these matters.

To ensure efficient uses of irrigation pumps village pumps operators are also trained by the Member Service staff of the PBS. Training courses include selection of the appropriate types of pumps and motors and their operation and maintenance procedures.

Most important of all the training programmes undertaken by the PBSs is the 'village electrician' training programme. Young people having secondary level education of the PBS area are offered free training to work as free-lance village electricians on successful completion of the standard courses. The training includes both theoretical and practical courses. The trainees are required to pass examinations and practical tests arranged under the supervision of REB Instructors. During the last 5 years some 7000 rural youths took part in village electrician training courses and among them some 4000 are now working as free lance village electricians in the 18 energized PBSs.



Village Advisers at a routine Seminar



Village Electrician Trainees



## SYSTEM DESIGN, MATERIAL SPECIFICATION CONSTRUCTION STANDARD AND DISCIPLINE

As the rural loads are scattered and predominantly single phase in character the distribution system is planned with a combination of three phase and single phase lines. The advantage of this type of system is its flexibility and adaptability for future loads. Initially the system will have more single phase lines connecting more areas with lesser investment. As the load will grow to justify three phase lines, the same can be converted readily to three phase lines just by adding a cross-arm and 2 conductors.

These distribution Co-operatives will receive power from the sub-transmission lines of 33000 or 66000 volts. The nominal voltage for the primary distribution system is 1100-6350 volts. The special characteristics of this system : It is a 4 wire Y system and the system neutral has 4 to 5 grounds per mile. The system design ensures standard voltage to the consumer end. For that more primary lines are made with minimum length of secondary or LT lines. The distribution transformers are installed close to the consumer locations. The distribution transformers are single phase type and for optimum utilization smaller size transformers upto the size of 5 KVA are used.

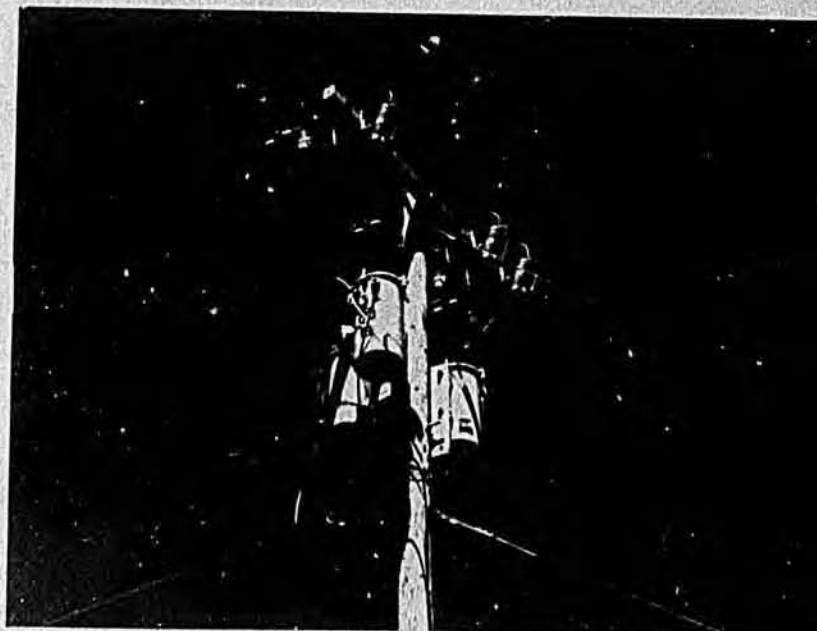


Stacks of wooden poles, both imported and locally supplied (by BFIDC).

These rural distribution lines are not constructed just for the sake of constructing some lines to connect some consumers. Before the construction, the lines are properly designed and staked. For an economic design Rural Electrification Board developed the guidelines and procedures so that each taka investment is worth spent. To ensure the implementation Engineers of the local consulting Firms are properly trained before they start the design and staking of the lines. Before the construction each pole location with all its configurations are located on the staking sheet with a peg put in the field where the pole to be set. For reliability a proper sectionalizing study is made and a well co-ordinated sectionalizing system is designed.

Simultaneously REB developed a construction standard for the distribution system. No construction is allowed outside this standard. To ensure this standard construction all construction personnel including the supervisors are trained by Rural Electrification Board. This construction standard maintained quality construction in total electrification programme at the same time it has standardised line hardwares. Use of same types of hardwares has generated such a volume that will influence the local manufacturers to establish new industries. To develop local industries local market is a must and total distribution system in the country using same materials only can create a market. Already some developments in local manufacturing are noticed.

Poles, Cross-arms and the anchors form a huge volume and at the same time involve a considerable portion of the total investment. REB has developed a specification of wood poles and has introduced the wide use of wooden poles, cross-arms and log anchors. Wood poles are cheaper. If we consider the available local sources it is only the wood poles we can get from our own country. It is encouraging to note that BFIDC has made much progress in supplying poles, cross-arms and log anchors. REB has extended its full co-operation and help to BFIDC to increase their production and maintain quality. This standardization has created a reliable market of wood poles and the pole equivalents reducing dependency on foreign countries for the distribution system.



A single-phase transformer bank.

## RE ACTIVITIES DURING 1984-85

For the FY 1984-85 a sum of Tk. 862.80 million (Local Currency Tk. 217.80 million and Foreign Exchange Tk. 645.00 million) was allocated for

the Rural Electrification Board. Project wise allocation vis-a-vis expenditure is given below :-

### PROJECTWISE ALLOCATION VIS-A-VIS EXPENDITURE INCURRED DURING 1984-85

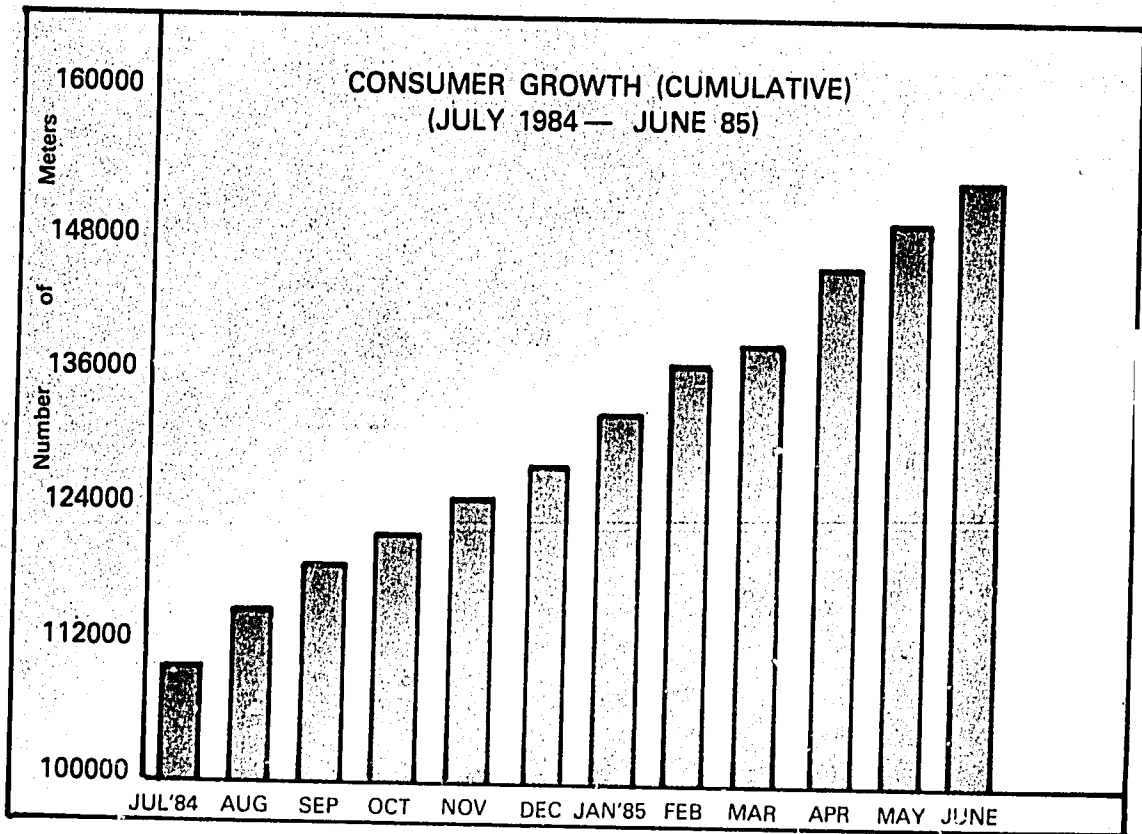
(Figures in Million Taka)

| Sl. No. | Name of the Project                       | Allocation |       |       | Expenditure |       |       |
|---------|---|------------|-------|-------|-------------|-------|-------|
|         |   | L. C.      | F. E. | Total | L. C.       | F. E. | Total |
| 1.      | ACRE-Phase-I                              | 546        | 800   | 1346  | 546         | 1885  | 2401  |
| 2.      | ACRE-Phase-I Extension                    | 671        | 2000  | 2671  | 671         | 1597  | 2268  |
| 3.      | ACRE-Phase-II-A                           | 328        | 1500  | 1828  | 328         | 2556  | 2884  |
| 4.      | ACRE-Phase-II-B                           | 613        | 2000  | 2613  | 613         | 2546  | 3159  |
| 5.      | Extension of Mymensingh and Tangail PBS-1 | 20         | 150   | 170   | 20          | —     | 20    |
| Total : |   | 2178       | 6450  | 8628  | 2178        | 8584  | 10732 |

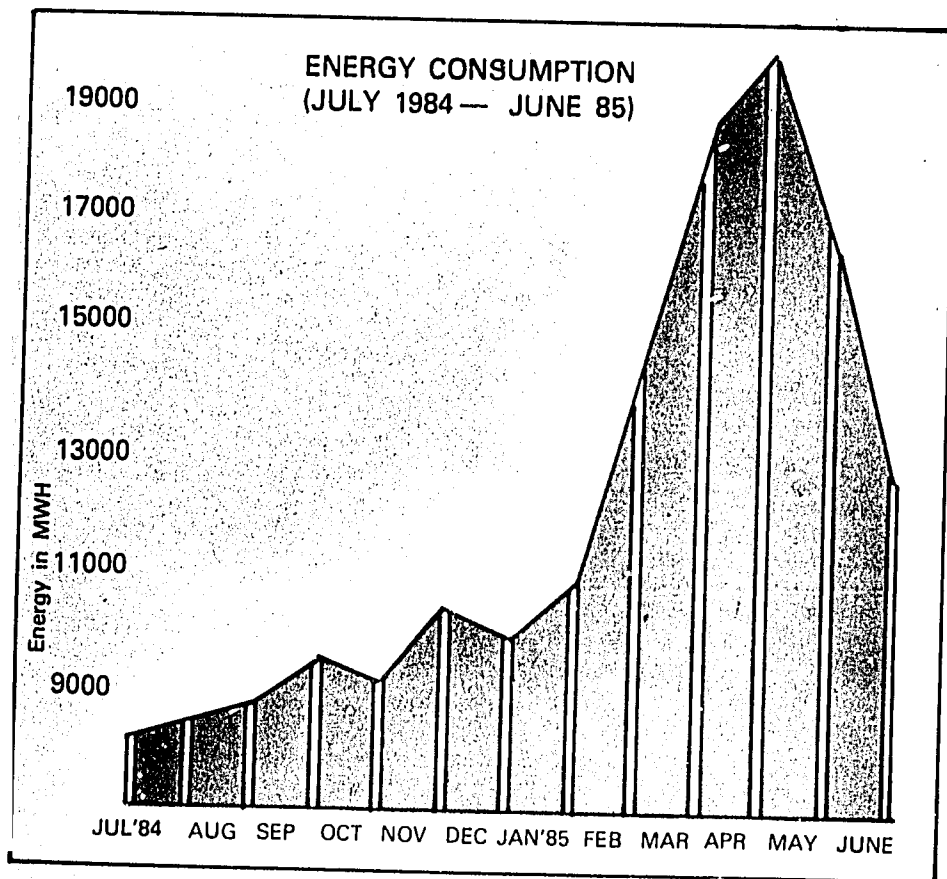
NB : Expenditure in foreign exchange depends on amount released by the donor agencies against goods and services purchased during the financial year.

### PHYSICAL TARGETS VIS-A-VIS ACHIEVEMENTS (FY 1984-85)

| Category                                 | Targets for FY 1984-85 | Achievement During FY 1984-85 |
|--|------------------------|-------------------------------|
| 1. Construction of Distribution Lines    | 2420 Km.               | 2420 Km.                      |
| 2. Construction of 33/11 KV Sub-Stations | 5 Nos.                 | 5 Nos.                        |
| 3. Meter Connections                     |                        |                               |
| a) Residential Meters                    | 31,500 Nos.            | 33,448 Nos.                   |
| b) Commercial Meters                     | 5,250 Nos.             | 8,164 Nos.                    |
| c) Irrigation Pumps                      | 1,500 Nos.             | 2,052 Nos.                    |
| d) Industries                            | 750 Nos.               | 870 Nos.                      |
| e) Others                                | —                      | 672 Nos.                      |
| f) Total :                               | 39,000 Nos.            | 45,206 Nos.                   |



During FY 1984-85 a total of 45,206 new connections have been provided in the 18 energized PBSs; a 42% increase over last years cumulative figures. Total connections as on June 30, 1985 stand at, 153697.



Energy Consumption during FY 1984-85 was 1,41,500 Mwh; a 61% increase over last years annual consumption.

**RURAL ELECTRIFICATION BOARD  
PART A - STATEMENT OF OPERATIONS  
FOR THE MONTH ENDING 30 JUNE, 1985**

| PARTICULARS                         | LAST YEAR | THIS YEAR | BUDGET<br>FOR THE YEAR | THIS MONTH |
|-------------------------------------|-----------|-----------|------------------------|------------|
| <b>REVENUE :</b>                    |           |           |                        |            |
| 1. Revenue from Merchandising       | —         | 13,37,790 | —                      | 4,99,184   |
| 2. Equipment Rental                 | —         | 9,54,450  | —                      | 1,99,271   |
| 3. Interest on Bank Deposit         | —         | —         | —                      | —          |
| 4. Contractors Penalty & Forfeiture | —         | —         | —                      | —          |
| 5. REB Misc. Income                 | 16,18,157 | 9,92,000  | 15,00,000              | 21,892     |
| 6. Sale of Tender Documents         | 6,59,185  | 8,51,621  | 8,00,000               | 49,1000    |
| 7. Income from PBS's                | —         | 2,775     | —                      | —          |
| 8. Interest on PBS Loans            | —         | —         | —                      | —          |
| 9. TOTAL REVENUE (1 thru 8)         | 22,77,342 | 41,38,636 | 23,00,000              | 7,69,447   |
| <b>OPERATING EXPENSES :</b>         |           |           |                        |            |
| 10. Pay and Allowances, Officers    | 38,74,865 | 40,09,497 | 55,30,300              | 4,03,461   |
| 11. Pay and Allowances, Staff       | 12,51,087 | 24,13,654 | 22,39,700              | 2,17,578   |
| 12. Pay and Allowances, Master Roll | 5,34,593  | 3,20,576  | 2,70,000               | 24,914     |
| 13. Honorarium-Ansars               | 1,92,129  | 3,96,812  | 1,90,000               | 1,52,795   |
| 14. Utility Bills                   | 4,04,834  | 5,47,755  | 5,00,000               | 61,693     |
| 15. Transportation M/O              | 22,76,032 | 32,19,934 | 29,00,000              | 3,34,733   |
| 16. Misc. Office Expense            | 3,96,667  | 1,99,774  | 96,000                 | 31,687     |
| 17. Printing and Stationery         | 7,23,475  | 15,35,134 | 10,00,000              | 64,286     |
| 18. Communications Expense          | 5,13,329  | 6,20,453  | 5,00,000               | 85,824     |
| 19. Travel and Allowances           | 6,37,636  | 6,28,923  | 5,42,000               | 57,892     |

**RURAL ELECTRIFICATION BOARD  
PART A - STATEMENT OF OPERATIONS  
FOR THE MONTH ENDING 30 JUNE, 1985**

| PARTICULARS                      | LAST YEAR     | THIS YEAR     | BUDGET        | THIS MONTH    |
|----------------------------------|---------------|---------------|---------------|---------------|
| 20. Rent                         | 27,58,336     | 38,70,366     | 20,00,000     | 7,21,317      |
| 21. Entertainment Expense        | —             | 1,12,253      | 85,000        | 7,166         |
| 22. Employee Welfare Expense     | 7,26,064      | 8,66,722      | 10,13,000     | 2,40,843      |
| 23. Publicity and Advertizing    | 1,52,842      | 4,71,056      | 3,00,000      | 22,637        |
| 24. Legal Expense                | —             | 2,14,325      | 70,000        | —             |
| 25. Advisory Services            | 24,000        | 21,162        | 80,000        | 2,250         |
| 26. Insurance Premiums           | —             | —             | —             | —             |
| 27. Sports and Cultural Expenses | —             | —             | —             | —             |
| 28. Repairs and Maintenance      | 3,75,575      | 4,12,211      | 3,00,000      | 25,665        |
| 29. Depreciation                 | 24,62,726     | 30,76,242     | 31,77,000     | 2,42,485      |
| 30. PBS Energization Expenses    | —             | —             | —             | —             |
| 31. Training Expenses            | 56,661        | 32,246        | 90,000        | 238           |
| 32. Workshop Expense             | —             | —             | —             | —             |
| 33. Misc. General Expense        | 5,45,187      | 1,26,111      | 5,50,000      | 28,475        |
| 34. TOTAL OPERATING EXPENSES     | 1,79,06,038   | 2,30,95,206   | 2,14,33,000   | 27,25,939     |
| 35. OPERATING MARGIN             | (1,56,28,696) | (1,89,56,570) | (1,91,33,000) | (19,56,492)   |
| 36. Interest Expense             | 1,53,82,776   | 2,94,33,193   | —             | 1,00,10,000   |
| 37. NET MARGIN AFTER INTEREST    | (3,10,11,472) | (4,83,89,763) | —             | (1,19,66,492) |

**CERTIFICATION**

I hereby certify that the entries in this report are in accordance with the accounts and other records of the Rural Electrification Board, Finance Directorate and reflect the status of the account to the best of my knowledge and belief.

Dated July 25, 1985

Director Finance

**RURAL ELECTRIFICATION BOARD  
PART B, BALANCE SHEET  
AS AT 30 JUNE, 1985**

**ASSETS AND OTHER DEBITS**

| A. FIXED ASSETS :                        | LAST YEAR TK. | THIS YEAR TK. |
|--|---------------|---------------|
| 1. REB General Plant                     | 5,34,29,873   | 7,50,24,027   |
| 2. Depreciation                          | (87,97,910)   | (1,08,71,537) |
| 3. Net General Plant                     | 4,46,31,963   | 6,41,52,490   |
| 4. Construction WIP REB                  | 19,07,098     | 80,01,669     |
| 5. Construction WIP PBS                  | 12,55,51,722  | 51,95,01,440  |
| 6. Long Term Loan to PBS's               | 159,69,69,471 | 166,42,16,941 |
| 7. TOTAL FIXED ASSETS                    | 176,90,60,254 | 225,58,72,540 |
| <b>B. OTHER PROPERTY AND INVESTMENTS</b> |               |               |
| 8. Deposit With Other Organizations      | —             | —             |
| 9. Special Fund                          | 1,71,22,694   | 7,48,39,799   |
| 10. TOTAL OTHER PROPERTY AND INV.        | 1,71,22,694   | 7,48,39,799   |
| <b>C. CURRENT ASSETS :</b>               |               |               |
| 11. Cash at Bank                         | 8,37,97,567   | 94,55,567     |
| 12. Working Fund                         | 22,63,095     | 30,51,000     |
| 13. Medium/Short-Term Loan               | 1,08,32,463   | 46,41,005     |
| 14. Advance to Employees                 | 12,70,828     | 15,06,975     |
| 15. Plant Materials & Op. Supplies       | 29,33,91,198  | 79,96,41,393  |
| 16. Prepayment & Other Receivable        | 12,93,26,712  | 10,77,62,078  |
| 17. Misc. Current Assets                 | 9,50,273      | 29,30,496     |
| 18. TOTAL CURRENT ASSETS                 | 52,18,32,136  | 92,89,88,514  |
| <b>C. DEFERRED ASSETS :</b>              |               |               |
| 19. Deferred Assets                      | 58,92,965     | 1,10,64,739   |
| 19A Store In Transit                     | —             | 2,00,98,160   |
| 20. Loan to REB Employees                | 62,794        | 11,24,237     |
| 20A. TOTAL ASSETS AND OTHER DEBITS       | 231,39,70,843 | 329,19,87,989 |

**LIABILITIES AND OTHER CREDITS**

| A. EQUITIES & MARGINS :          | LAST YEAR TK. | THIS YEAR TK.  |
|----------------------------------|---------------|----------------|
| 21. Govt. Grant                  | 101,70,29,000 | 123,19,33,000  |
| 22. Foreign Grant                | 54,48,74,271  | 1,85,68,304    |
| 23. Donated Capital              | 3,15,63,587   | 5,12,31,879    |
| 24. Capital Gain                 | —             | —              |
| 25. Retained Earnings            | (9,70,77,531) | (14,50,87,323) |
| 26. TOTAL EQUITIES AND MARGINS   | 149,63,89,327 | 115,66,45,860  |
| <b>B. LONG TERM LOAN :</b>       |               |                |
| 27. Govt. Loan                   | —             | —              |
| 28. Foreign Loan                 | 73,94,34,675  | 208,46,87,768  |
| 29. Accrued Interest on Loan     | —             | —              |
| 30. Other Long Term Liability    | 24,02,519     | 28,43,323      |
| 31. TOTAL LONG TERM LOAN         | 74,18,37,194  | 208,75,31,091  |
| <b>C. CURRENT LIABILITIES :</b>  |               |                |
| 32. Accounts Payable             | 1,78,591      | 1,93,98,545    |
| 33. Voucher Payable              | —             | 61,007         |
| 34. Security Deposit             | 1,86,72,908   | 2,36,49,513    |
| 35. Taxes Accrued                | —             | —              |
| 36. Tax Collection Payable       | —             | —              |
| 37. Misc. Current Liabilities    | 62,74,246     | (1,08,358)     |
| 38. TOTAL CURRENT LIABILITIES    | 2,51,25,745   | 4,30,00,707    |
| <b>D. DEFERRED LIABILITIES :</b> |               |                |
| 39. Deferred Liabilities         | 5,06,18,577   | 48,10,331      |
| 40. TOTAL LIABILITIES & CREDITS  | 231,39,70,843 | 329,19,87,989  |

**RURAL ELECTRIFICATION BOARD**  
**STATEMENT OF SOURCES AND APPLICATION OF FUNDS**  
**AS-AT 30th JUNE, 1985**

| FINANCIAL STATEMENT            |                                   | (Thousand of Taka)     |  |                        |
|--------------------------------|-----------------------------------|------------------------|--|------------------------|
| Line No.                       |                                   | LAST YEAR<br>(CLOSING) | THIS YEAR<br>(UP-TO-REPORTING<br>TIME) | CHANGES<br>IN THE YEAR |
| <b>A. SOURCE OF FUNDS</b>      |                                   |                        |  |                        |
|                                | 1. Operating Margin               | —                      | (18,957)                               | (18,957)               |
| OS-29                          | 2. Depreciation                   | —                      | 3,076                                  | 3,076                  |
| BS-2                           | 3. Accumulated Provision for Dep. | 8,798                  | 10,871                                 | 2,073                  |
| BS-6 (Credit only)             | 3. Repayment of Loan by PBS's     | —                      | —                                      | —                      |
| BS-22                          | 4. Foreign Grants                 | 5,44,874               | 18,568                                 | (5,26,306)             |
| BS-21+23+24                    | 5. Increase in Equity             | 10,48,593              | 12,83,165                              | 2,34,572               |
| BS-31 (Credit only)            | 6. Project Loan                   | 7,39,435               | 20,87,531                              | 13,48,096              |
| BS-39                          | 7. Deferred Credit                | 50,619                 | 4,810                                  | (45,809)               |
| BS-25-OS+35-29                 | 9. Retained Earnings              | (97,078)               | (1,29,208)                             | (32,130)               |
|                                | <b>Total :</b>                    | <b>22,95,241</b>       | <b>32,59,856</b>                       | <b>9,64,615</b>        |
| <b>B. APPLICATION OF FUNDS</b> |                                   |                        |  |                        |
| BS-31 (Debit only)             | 1. Amortization of Loan by REB    | —                      | —                                      | —                      |
| BS-6 (Debit only)              | 2. PBS Loan Sanctioned            | 16,07,802              | 16,64,217                              | 56,415                 |
| BS-4+5                         | 3. Construction Work in Progress  | 1,27,459               | 5,27,502                               | 4,00,043               |
| BS-1                           | 4. REB's Capital Expenditures     | 53,430                 | 75,024                                 | 21,594                 |
| BS-7+8+9+20                    | 5. Special Fund and Deposit       | 17,123                 | 75,964                                 | 58,841                 |
| BS-18-3B                       | 6. Working Capital                | 4,83,534               | 8,85,987                               | 4,02,453               |
| BS-19                          | 7. Deferred Debit                 | 5,895                  | 31,162                                 | 25,269                 |
|                                | <b>Total Application of Funds</b> | <b>22,95,241</b>       | <b>32,59,856</b>                       | <b>9,64,615</b>        |

## BASIC CHARACTERISTICS OF A TYPICAL PBS

### Area Characteristics

|                           |                         |
|---------------------------|-------------------------|
| Nos. of Upazilla included | 4 to 5 Nos.             |
| Geographical area         | 500 Sq. Miles           |
| Population                | Approximately 1 Million |
| House Holds               | 1,68,000 Nos.           |

### Initial Infra-structure

|  |           |
|--|-----------|
| 33/11 KV Sub-Stations<br>(5 MVA Capacity each)         | 3 Nos.    |
| Power distribution Line<br>(11 KV and below)           | 750 Miles |
| Facilities for Service<br>Connections                  |           |
| a) Residential Meters<br>(to serve 41,250 house holds) | 16,500    |
| b) Commercial Consumers                                | 2,139     |
| c) Deep Tube Wells                                     | 165       |
| d) Shallow Tube Wells                                  | 398       |
| e) Low lift pump                                       | 150       |
| f) Industries  | 248       |
| Total Meters   | 19,600    |

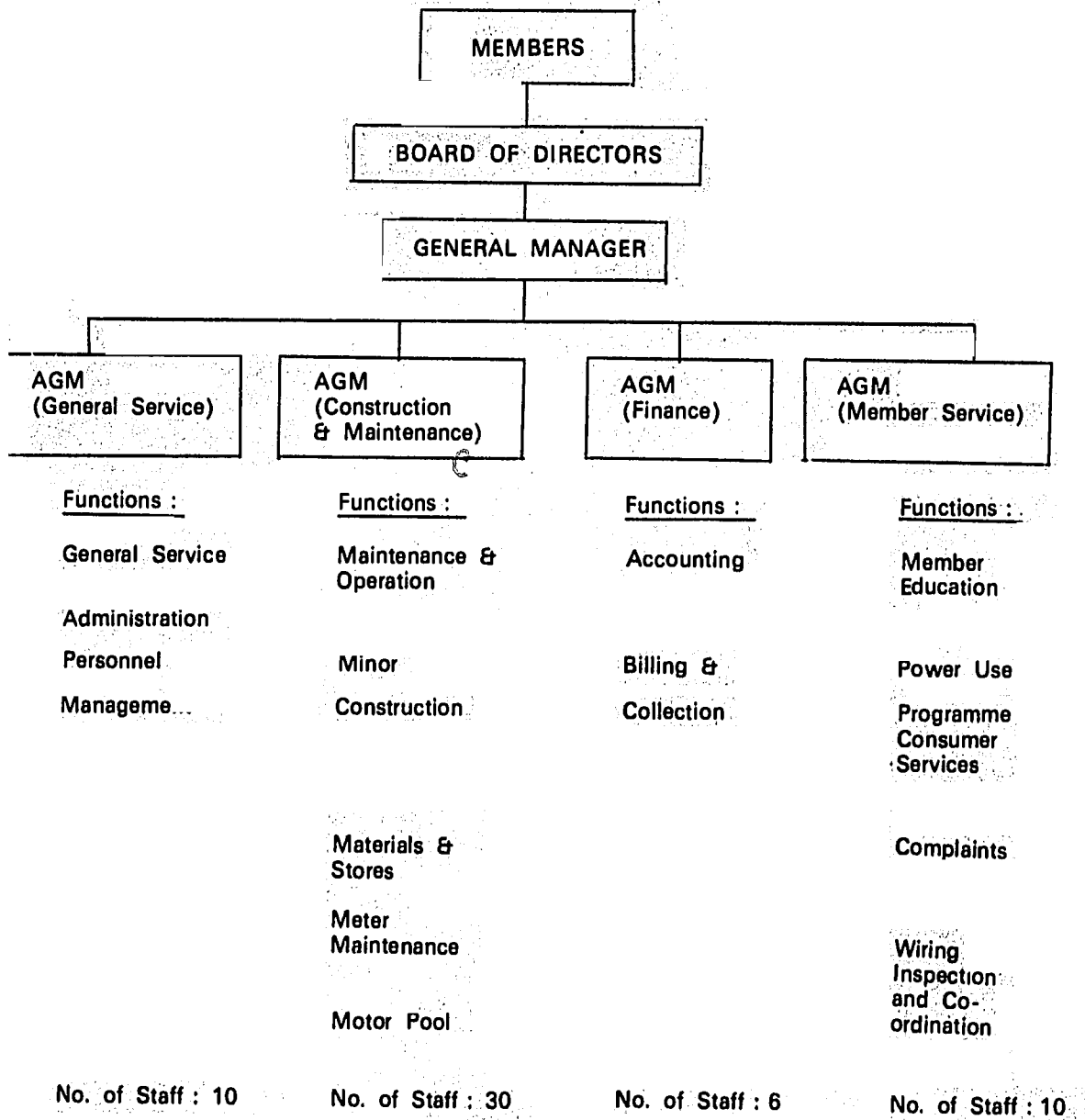
### Materials required to construct a typical PBS System

|                                    |                 |
|------------------------------------|-----------------|
| Wooden Poles                       | 17,600 Nos.     |
| Wooden X-Arms/Anchor<br>Log        | 16,750 Nos.     |
| Bare Conductor                     | 740 Metric Tons |
| Duplex/Quadruplex                  | 680 Wire Miles  |
| Transformers (5 KVA to<br>167 KVA) | 3,050 Nos.      |
| Oil Circuit Recloser               | 155 Nos.        |
| Voltage Regulators                 | 15 Nos.         |
| Insulators                         | 78,850 Nos.     |
| Single Phase Meters                | 19,000 Nos.     |
| Three Phase Meters                 | 600 Nos.        |
| 33/11 KV Sub-Stations<br>(5 MVA)   | 3 Nos.          |

### Estimated Cost (1985 Constant Price)

|                     | US \$         | Taka           |
|---------------------|---------------|----------------|
| Foreign Exchange    | 9.00 Million  | 250.20 Million |
| Local Currency      | 3.60 Million  | 100.08 Million |
| Total               | 12.60 Million | 350.28 Million |
| Construction Period | 5 Years       |                |
| Initial Connections | 7th Years     |                |

## ORGANIZATION CHART OF A TYPICAL PBS (RURAL ELECTRIC SOCIETY)

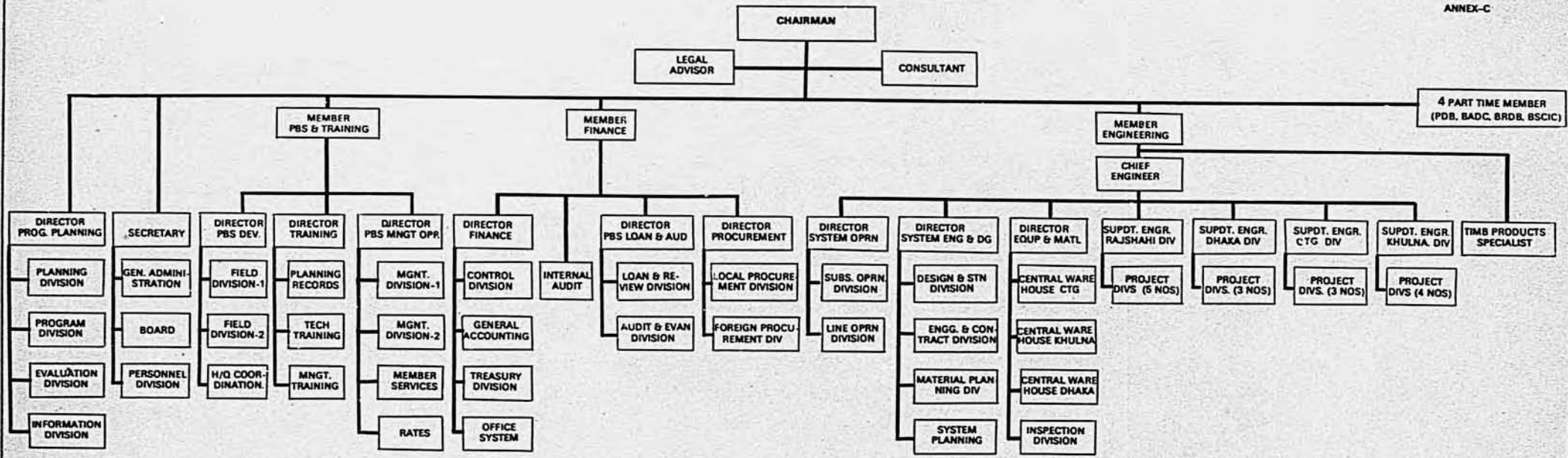


**NB :** The PBS from the onset of their operation do not recruit the full complement of the set-up, but progressively recruit them on clearance from REB for each position.



# RURAL ELECTRIFICATION BOARD BANGLADESH ORGANIZATION CHART

ANNEX-C



31