CHAPTER II

REVIEW OF LITERATURE

While analyzing various functions of SEBs the vital function is to be of finance. It needs due attention and actions for better performance. Therefore Reviewing literatures related to financial performance of SEBs is to be of most relevant and useful. Accordingly functioning of SEBs in various states in India is a subject matter of recent interest. Public undertakings are increasingly and rightly a major source of study in Indian Economic Development but such studies never extended to the field of power generation, transmission and distribution as a whole. However attempts have not been made so far in India to make in-depth study of financial performance of Electricity Boards more particularly TNEB.

Financial performance of SEBs mainly concerned with Revenue realization and Costs incurred and the Tariff policy adapted by Govt. In this connection great advances have been made in the financial performance of SEBs in developed countries. But in India, there is paucity of literature on financial performance. Most of the literature are available in this context, it is necessary to mention that most of the publications, seminar papers, research papers and articles are mainly concerned with the problems of SEBs from a particular region but not on comprehensive study basis. Much articles have been appeared in periodicals in recent years but it has not been assembled under one book for study and ready reference. There is also no standard book
available in India that can give all solutions to all the problems which confront,
the SEBs in their commercial activities. Therefore review of literature would
enable the readers to identify problems, invoke thinking and suggest
appropriate solutions for the problems.

The Analysis of Financial performance of SEBs mainly based on various factors
such as costs and Revenue assets creation, borrowings subsides, free supply
to agriculture losses etc. In this context cost means pricing of power and
improvement in sales is related with Tariff policy adopted by the govt. Based on
the above various attempts made by Eminent citizens discussed below.

From the formations, State Electricity Board had set up “no profit, no loss” as a
guiding principle. The case of electricity is interesting in that from the
beginning of the use of electricity, electricity suppliers generally attempted to
set prices equal to cost.

According to Shri Ragesh Nath “the future outlook of the power sector is quite
thrilling, in the next 3 to 4 years. The country would have a fairly good power
generation and transmission capacity. However, we need to focus on
distribution for sustainable development.

The gap between cost of supply and the revenue realization is increasing the
financial losses of utilities are still very high. The states have to at least take up
the franchise route, if not full fledged privatization in areas with technical and
commercial losses” (1)
According to the monthly review of Tamil Nadu Economy journal dated on Dec’2006 “the overall financial performance of the manufacturing and service based industries in Tamil Nadu including TNEB have been poor in the year 2006.” (2)

According to Sanjai Dhavan “over a tenure of 5 to 10 years the net cost of power from alternative energy will be less by 20 to 30%. It will also be emission free.” (3)

According to CVJ Verma, Prisident, Council of power utilities New Delhi (Electrical India Journal Apr’2006 Page 50) “Transmission and Distribution losses as per CEA for 2006 -2007 were 29.89%. It is a fact that considerable energy is not earning the revenue that it should” (4)

According to India Power Journal dated on Apr-Jun-2009 (Page No.40) “the present situation calls for some special financial measures for power sector, such as relaxing RBI guide lines for Banks regarding exposure limits.” (5)

According to W.Arthur Lewis the essence of two part charging is that the consumer is required to pay two charges one which varies directly with the amount to quantity consumed and another which does not (6). For electricity, one may be asked to pay a fixed charges depending on the size or a variable value of one house plus a charge per unit of actual consumption. In the electricity, industry where it was first adopted the two part tariff is now almost universal.
Venkataraman observes that there appears to have been no clear cut policy as to the framing of the tariff structure in each Electricity Board in the light of its own conditions(7).

The adequacy of the tariff structure also came in for critical scrutiny at the heads of the World Bank. The World Bank when it gives loans does not usually concern itself with the character of the tariff structure feeling that this is a matter for local determination. The world Bank observed that Indian rates are very low and should be increased so that cost should be covered.

A more important appraisal came in 1962 when a World Bank Mission made general survey of the India economy. It found that the average price of electricity in India was below the average Cost of Generation and distribution as well as the costs of prevailing in most other countries. In its view the tariffs were unsatisfactory both from the point of view of the level of the average price per kwh and from that of the structure of the tariff itself.

J.L.Leson has advocated that following costs should also be taken into account while fixing electricity tariff.(8)

1. Consumer related costs
2. Unit related costs.
3. Demand related costs.
Consumer related costs are those which will be incurred no matter how large or how small the number of units consumed e.g. billing and collection, connection, consumer services.

Unit related costs are those which vary directly with the number of units consumed e.g. fuel cost of generation a small part of distribution costs.

Demand related costs vary with the level at which a user consumes energy the cost of which is covered in the unit related charges. Because, electricity cannot be stored on any scale demand must be when it occurs. Consumers who require energy at system peak or contribute to a distribution peak on the system are charged through demand related costs.

Prof. Sonachalam has advocated that both economic and technological arguments held setting price equal to cost as an when violable maximum. The ceiling on electricity rates will be determined by the ”value of service and the ability to pay” of the consumer categories. Finally, he has observed that no technique of rate fixing can offer a permanent solution except in a static world. Price fixing in electricity has political, social and administrative aspects. Conditions are much more dynamic here and no price policy will be satisfactory to changed conditions (9).

Dr. Chanashyam Nath in his Ph.D. thesis on “study of Assam state Electricity Board” has suggested that administered pricing policy in electricity organisation reduces the profit margin of the Board. Though from the consumer point of
view, the administered pricing is an encouraging one, the same is not desirable from economic consideration of the Board (10).

Dr. Shankar in his study report on “optimum rate structure for public enterprises, a study of TNEB has remarked the mounting losses have caused financial burdens to the Boards and lower rates of utilization of existing capacities coupled with steady increase in demand due to extension of electricity to more areas and more uses and low tariffs have resulted in serious power shortages crippling economic growth (11) Further, he has users to conserve this scarce good and resulted in power shortage and wasteful use of energy.

According to Suresh. P. Sharma who conducted a study on “Energy pricing policies in Nepal” reported that electricity tariff structure in Nepal is largely influenced by social welfare aspects and the existing tariff on electricity is below the marginal cost of electricity generation and distribution. (12).

Hiren Sarkar and Gopal Kadekodi have raised three questions in the context of electricity pricing.

1. What is the real or social cost of power supply in India?

2. Why are the SEBs generally in loss?

3. What is the linkage between electricity and economic development(13)

They have also analysed the losses attributable to SEBs are furnished below:-

a. Significant transmission and distribution losses.
b. Massive expansion of Rural Electrification.

c. The average cost per KWh.of power supply was in fact less than average revenue.

d. Fuel input price

e. Subsidised price rigidities introduced in certain types of users such as agricultural and small and medium industries.

According to S.L. Khosla and Goapalsawami, T.V. the following areas bear on the efficiency of the operations of the Board in both physical and financial terms.

1. Capacity utilization (Plant load factor) of thermal stations.

2. Levels of auxiliary consumption and T&D losses.

3. Coal and oil consumption in thermal stations.

4. Staff productivity. Prompt realization of revenue arrears.

5. Control over inventory levels and

6. Suitable realisation and revision of tariff structure to cover cost of operations and to build up retained surpluses for investment (14).

Rajana Y.N. in his article, 'Financial Policy to be followed by the SEBs“ is of the opinion that SEBs must follow a policy of “No profit, No loss“ in their operations in the larges interest of economic development of the country as electricity is
the basic need for industries and has become essential for day – to – day living (15).

Rajagopalan K.T. observes that one cardinal principle to be taken note of in any formulation of power tariff structure is that the average revenues per unit (KWh) of electrical energy should always be higher than the total costs per KWh sold (16).

According to Murthy the anticipated huge loss (10-05-1988). TNEB owes a lot of money to the Neyveli Lignite Corporation, thereby affecting supply of power from Neyveli. Similar, are its dues to coal India which is affecting coal supply. This has been caused because of lopsided political decisions without considering Engineering, Economics and the Fundamental principles of power generation, transmission and distribution and supply to consumer points.(17)

Prof. N.S.S. Arokiasamy has suggested the following points for formulation power pricing policies.

Power supply meant to the weaker sections of consumers cannot be below half the present weighted average cost of making it available. The state Governments must resort to other methods of helping these sections rather than stretching subsidies on power sales to far out free power supplies (18).
Review of symposium papers

Financial performance of SEBs are also analysed from various symposiums organized by various agencies. While analyzing that issues which will have impact in the Financial performance such as Financial Policies/systems etc have to be taken into consideration. Accordingly A symposium was organised by the Central Board of Irrigation and Power during October 1964 at New Delhi and the main theme of the symposium is “Financial Policies to be followed in the Electricity Supply Industry in India” and the main views symposium are discussed very briefly here.

Harban Singh in his paper on “Tariff Policy” mentioned among guiding principles of tariffs that the cost per unit sold to the suppliers should be inclusive of all charges that the supplier has to incur for the supply of power to the consumer (19).

P.C. Mankodi in his symposium paper on “Tariffs and Financial Policies to be followed in electricity supply industry in India” has suggested that in formulation of tariff schedule it should be kept in mind that the consumers are not charged more than values of service to the customer which could be upper price limit. (20)

Kali, while presenting a symposium paper on “Tariff and Financial Policies to be followed in electric supply industry in India” has urged that it charge that a Board has to meet. He has type of consumers in the region supplied the same power systems (21). He has also stated that every consumer should bear the
cost of supply to him and not expected to be subsidized by others. He has in
this context made reference to the fact that in some cases the rate quoted for
industrial consumption is lower than that of the cost price with a view to
attracting industries to its area. He is of the opinion that effective measures
should be taken to combat this practice. He has also suggested that industries
which adjust their working hours to reduce the cost of electricity supply deserve
consideration.

Indrani and Gengar in their paper on “Principles for the formulation of
electricity supply tariff” directed that unremunuerative rural electrification
should not be undertaken a the present working of the Boards reveals that they
are not even able to meet interest charges after providing for depreciation
operation and maintenance.(22).

Shegal and Gupta in their paper on “Price Policy of Public Sector supply
undertaking and Tariffs” have pointed out the losses that the SEBs are
undergoing proposed rates of supply should be a level which will pay back all
the obligatory expenses including depreciation, operation and maintenance
taxes etc., (23).

Desirkar in his paper on “Pricing Policy and Tariffs in Power supply industry” is
also of the opinion that power supply tariff should relate as nearly as possible
to the cost of rendering service and each group of consumers should bear the
cost as equitably a possible (24) (agricultural sector).
Foy Choudry is of the opinion that due to large scale power development taking place in Public sector at present it has become necessary to review the tariff and financial policies laid down in the electricity (Supply) Act 1948. The author opined that provisions made in the Act are not sufficient in the present cost of large scale power development.(25).

Bhimasena in his paper on “Simplifications of Tariff structure” suggested that when electricity tariffs are drawn up, consideration would be given for making it simple so that it is easily understood by the consumers and facilitates the preparation of energy bills without delay and difficulty.

In discussing the basis of tariff formulation for various categories of consumers Bhimasena has suggested that for all domestic and commercial lighting installations there should be uniform minimum service charges in addition to energy charge both as a source of revenue to the supplier and as a convenient way of billing of these installations which form the majority of service period (26).

As regards high tension tariff, he recommends that instead of the pattern in vogue at present it should be a simplified tariff consisting of demand charge based on maximum demand for the month with two or three graded rates per K.V.a. plus a flat energy charge per Kwh.
He also urged a sound tariff policy which should not only ensure minimum revenue but contribute to better system of operation:-

Mr. M.Y. Kali has also advocated that following were some of the characteristics of electricity tariff.

1. Uniform tariff for similar consumers.

2. Tariffs should not be below cost.

3. Concession to any industry is a matter for the Government

4. Industries which adjust their hours of working to reduce the cost of electricity supply deserve consideration and

5. Multiplicity use of electric motor be encourage wherever possible(27).

Kumar Surender in his Ph.D., thesis on “Financial performance and pricing police’ Haryana and Punjab undertakings” has remarked that the analysis of Haryana and Punjab SEBs shows that the Financial performance has been poor because of heavy and indiscriminate subsidization of the agricultural sector and high rate of electricity duty (imposed by the state Governments) Pricing policy is arbitrary as the tariff has no relationship to the costs of supply. (28).

Mr. Vasanth Sathe, then Union Minister for Power, while inaugurating a seminar on Finance of Stage Electricity Board has remarked as follows:
One of the Major responsibilities shouldered by the Boards is to supply electricity to the agricultural sector. Electricity is supplied by the Boards to the rural areas is much lower than even their cost of supply. The average cost of power in India is about 71 paise per unit while the average tariff for supply of power to the agriculture sector is only about 21 paise per unit. This is one of the major reasons why SEBs have been incurring heavy losses (29).

The National council of power utilities has shown that the SEBs are selling electricity to the farm sector and to a certain extent to the small industries sector well below their cost of production. The N.C.P.U. analysis has revealed that on single factor that has been responsible for about 80% of the financial losses suffered by the SEBs has been the unremunerative rates for sale of electricity to the consumers especially the farm sector. The crux of the matter essentially lies in allowing the SEBs to function on commercial lines by adopting a tariff structure which bears some semblance of relation to the costs of production. Such a step alone would help the SEBs to come out of the red and put them on a sound footing.

Suri.L.R. has assessed the losses suggested by the some of SEBs are more which have a comparatively higher component of agricultural loads and shows that the SEBs are suffering losses ranging from 30 paise to 60 paise per unit by supplying power to the farm sector at subsidized rates. Seven SEBs are suffering losses exceeding 50 paise per unit and four SEBs are suffering a loss of about 40 paise per unit on the average (30).
Mr. B. B. Vora, then Chairman of the Energy / Advisory Board indicates that there is no escape from having to put the power sector on a commercial footing and that in order to do so tariff will have to be raised. Experiments like Tamil Nadu Supplying free power must end. Flat rate charges for power as in some states also need to go or else farmers will run pump sets continuously. (31).

According to Mr. Pachauri who heads the Tata Energy Research Institute, several studies have shown that a large part of agricultural power goes to the rich farmers who are being subsidized without any justification. (32).

Mr. Shishoo, then Chairman of National Thermal Power Corporation has reported that when key industries like coal and steel are starved of power, the agriculture sector is being pampered. (33)

The committee on power has shown that the tariff for agricultural category is substantially below the average cost of supply in all the utilities and in fact this category is substantially responsible for the losses of many SEBs.

According to Mr. Viswanath then Managing Director, Calcutta Electric Supply Corporation, the TNEB has incurred accumulated commercial loss of Rs. 870 crores during the Sixth Plan and is continuing to incur commercial losses at the rate of about Rs. 170 crores per annum, the substantial part of the loss being attributable to losses incurred on the sale of energy to the agricultural sector (34).
Dr. Hema in her Ph.D. thesis on “Optimum rate structure for Tamil Nadu” has pointed out that the present tariff structure of TNEB is observed to be heavily subsidizing the energy consumption of the agricultural sector as directed by the policies of the Government of Tamil Nadu. The large farmers are required to pay nominal fixed charges per annum while no justification for free supply of Electricity to any group. Electricity is a commercial good not a social good. It is therefore, suggested that the large farmers be made to pay according to their cost incidence on the system. The small farmers may be offered a subsidy by they must at least pay the energy cost per unit relevant for the L.T. end.(35).

Mr. Ramesh K. Doga then Chairman of the confederation of engineering Industry (Southern Region) has mentioned that a policy decision on the upward revision of subsidized power to the agricultural sector needed to be done on a priority basis. The agricultural sector should also be made to share the cost of power production and the State Government should not expect industry alone to provide revenue to the Electricity Board (36).

According to Nayak Power pricing consistent with the provisions of Electricity ACT, It may be inferred from the review of Literature that Financial and Tariff policy is always a delicate matter and a constant worry to any SEB in India. There are well laid out principles for determining the costs of power supply to various categories of consumer s and fixing the tariffs. If these are followed strictly the SEBs should not incur any loss. But the Boards are not free to do so
as they have to follow the directives that may be issued by the State Governments on political and social considerations. Hence, prompt care and attention should be paid while framing tariff structures as well as revising tariff rates from time to time (37).

**Analysis and Presentation of Data**

Annual statement of Accounts and Balance Sheets Administrative Reports Statistics at a glance pertaining to TNEB and Annual Reports of SEBs published by planning commissions, Reports of Working group on power published by ministry of power. Reports of CEA for various years and Recommendations of committees on power constituted by the Govt of India were analyzed. A cursory reference has revealed that operational expenditure is always higher than Revenue in Tamil Nadu. If Annual Revenue is higher than expenditure TNEB is not able to achieve 3% rate of return every year after taking subsidies into account.

Tariff revision should be gradual. Tariff increase in domestic, public lighting water supply and agricultural is very nominal in Tamil Nadu.

Cost data was also compared with the rate charged for HT services and LT services, one of the significant factor of the study is that the rate charged for domestic and agricultural sector is always lower than generation cost in the State due to Socio Economic considerations.
Significance of the Study

With a view to study the Financial performance on a national basis, a study of TNEB was chosen. This study gives in details of Revenue generation, assets and liabilities cost generation cost of supply, subsides sources and uses fund etc., in TNEB. It is hoped that this Research study will be of practical use to all those who have a responsibility for the generation and distributions transmission of power with cost consciousness. It will also serve as a policy framing and informative Research study to Economic commentators, Research scholars and others who may be interested in a scientific study of the financial performance of SEBs in the country. This study spans a vast range of topics like income and expenditure revenue realization sources and uses funds cost of generation cost of supply Assets and liabilities ,tariff structure of HT consumers and LT consumers.

There are ample evidences that on the operational and financial side there is definite scope for improvement at various levels viz., operational; administrative system including financial system. What stands out is that over a large number of years, that there has been absence of concern and concerted thinking on the financial performance of the SEBs. Therefore, an intensive study into the financial performance of TNEB would be of immense value in the policy formulations not only for TNEB but also for other SEBs in the country. It is also hoped that this study will lead to further research studies in the power sector as a whole.
Limitations of the Study

It is worth to ponder over the limitations under which the study has been made. The limitations of the study can be generally analysed under the following heads;

1. Primary data
2. cost data
3. technical data
4. miscellaneous

1. Primary data

This study is based on entirely on secondary data. The possibility of understanding primary data collection by means of field investigation bristles with intractable difficulties. First and foremost formidable factor is the unwidely size of the universe of the population for any sample study. For instance, there are 1.94 Crore electricity consumer sin Tamil Nadu. Moreover the consumers are not homogeneous in character. There are not a few but 19 categories of consumers of whom 7 are High Tension services and 12 L.T (Low tension ) services in Tamil Nadu.

Under the circumstances the stratification of the sampling study conforming to the statistical dictum, “Probability proportional to size category wise” becomes rather unmanageable. Further as regards tariff structure Tamil Nadu do not have uniform set up. For example, Tamil Nadu does not distinguish between
an urban and rural consumer under domestic services, in view of the above enumerated principle problems the Research could not go in for Primary data collection. This is the theoretical and Methodological limitation.

**Cost data**

Another important limitation of the study is cost data. The above data since it is purely confidential in nature. The above information is very essential for revising the tariff from time to time. However, the above information was derived from secondary data available in planning commission Reports.

**Technical Data**

The technical problems in this research study are (a) complexity due to the mass technical details which must be considered in designing rate schedule, (b) Ignorance of rate makers of demand and supply functions. (c) In need to consider numerous conflicting standards of fairness and functional efficiency. These technical problems play a very important role in the study of financial performance.

Some of the technical problems, which are mainly concerned with generation and distribution of Electricity are furnished below:

i) Load Factor
ii) Diversity factor
iii) Power factor
iv) Losses
Load Factor

Load factor means the ratio of the average demand for the month in Kilo watts to the maximum demand for the month in Kilo watts.

Diversity factor

The diversity factor is defined as the ratio of the sum of maximum demand of several consumers to their maximum simultaneous demand.

Power factor

Power factor means the ratio of the real power to the apparent power.

Losses

Another factor which affects the cost of energy i.e. Line losses in transmission and distribution systems. Inherently, even apparatus and circuits used in power supply industry involve some energy loss and it is known as auxiliary consumption.

While analyzing financial performance the above factors should also be taken into account.

Miscellaneous

Other important limitations of the study are:

1. Accurate Cross subsidisation particulars were not available

2. It is very difficult to balance the fiscal objectives with the welfare objectives while revising electricity tariffs from time to time.
3. While comparing the revenue and expenditure, Accurate Details like Power purchase, O&M expenses establishment and central excise duty, interest on institutional credits etc. were not available, The above particulars are necessary for evaluating the Financial performance.

4. The above mentioned were some of the limitations of the study. However in spite of these limitations it is hoped that the present study would be a sufficient model for evaluating the Financial performance with other Electricity Boards.

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