



RURAL ELECTRIFICATION

(Pondicherry Region)

An Evaluation Report

ISSUED BY

BUREAU OF STATISTICS AND EVALUATION
GOVERNMENT OF PONDICHERRY
1970

INTRODUCTION

The Evaluation Report on "Rural Electrification, Pondicherry, Region" is the seventh issue in the Evaluation series of the Bureau of Statistics and Evaluation, Pondicherry. This issue critically deals with the various aspects of the rural electrification programmes implemented in Pondicherry Region by the Department of Electricity, Pondicherry.

The willing co-operation extended by the Department of Electricity, Pondicherry in providing the requisite facilities in the conduct of this study is gratefully acknowledged. The comments of the Director of Electricity, Pondicherry are also appended to the report.

It is hoped that this publication will be quite useful to all those who are interested in the evaluation of Plan Schemes.

Pondicherry,
15th April, 1970,

V.SUBBARAYALU,
Director.

EVALUATION REPORT ON "RURAL ELECTRIFICATION"

(Pondicherry Region)

Introduction :

Electricity is a powerful instrument of economic and social development. In the rural areas it can bring about far-reaching changes in methods of irrigation and farming and create conditions for the growth of industries and commerce and the provision of amenities generally associated with urban areas. It should help in raising the standard of living of the rural population and, thereby, contribute to the reduction of rural-urban disparity.

Objectives of Study :

The main objective of the study is to assess the extent of coverage achieved under the rural electrification programme and to assess the benefits derived from rural electrification. Though the tariff policy is an important factor determining the spread and growth of electrification, it has not been expressly included in the objectives. However, certain aspects of this field have been analysed, rather briefly, in the course of this study.

Sample Design :

The study covers the Pondicherry region. A list of all the 267 electrified villages in this region was obtained from the Electricity Department. These constituted the frame for the selection of sample villages. The method of selection of villages was to classify them into three groups according to the date of electrification and select 3 to 6% of villages from each group, as indicated below :—

TABLE 1—Total number of electrified villages in Pondicherry Region and number selected for the sample.

Sl. No.	Particulars	Total number of electrified villages in Pondicherry Region.	Number of villages selected for the sample.	Percentage of col. (4) to col. (3).
1	2	3	4	5
1.	Villages electrified prior to 1949.	63	2	3.2
2.	Villages electrified between 1949 to 1959.	68	4	5.9
3.	Villages electrified between 1959 to 1969. ..	136	9	6.7
	Total	267	15	5.6

Thus, the number of villages selected for this study is 15 out of which two villages were electrified prior to 1949, four villages between 1949 to 1959 and nine villages between 1959 to 1969. For selection at the household level, a frame was prepared of users of electricity in each village and eight households were selected at random from each village covering all use-categories, wherever possible. In addition to this, two non-users of electricity were selected at random from each sample village. A procedure was also laid down for substitution of some categories, if found blank, by others. The details of the sample are given in Table No. 2.

TABLE 2
Particulars of sample villages.

Serial Number	Particulars	Date of electrification of the village	Population of the village	Number of selected households		
				User households.	Non-user households.	Total
1	2	3	4	5	6	7
<i>Villages electrified prior to 1949 :</i>						
1.	Muthirapalayam (Oulgaret). ...	Prior to 49	1,413	8	2	10
2.	Pudukuppam (Nettapakkam) ...	Prior to 49	269	8	2	10
<i>Villages electrified between 1949 to 1959 :</i>						
3.	Sinnakarayambuthur (Bahur) ...	16-7-56	228	8	2	10
4.	Veeraragava Mudali thottam (Mudaliarpet)...	19-8-57	1,282	8	2	10
5.	Vadamangalam (Villianur).	31-12-57	221	9	2	11
6.	Podusaram (Oulgaret) ...	9-11-59	1,515	8	2	10
<i>Villages electrified between 1959 to 1969 :</i>						
7.	Kuruvisatham (Bahur)...	28-3-60	1,810	8	2	10
8.	Podupet (Oulgaret) ...	16-5-60	509	11	2	13
9.	Kottupalayam (Oulgaret).	16-5-60	162	5	2	7
10.	Kodathur (Mannadipet).	30-3-61	748	8	2	10
11.	Sivaranthagam (Villianur) ...	1-12-61	674	7	2	9
12.	Kizhur (Villianur) ...	19-1-62	427	10	2	12
13.	Sellipet (Mannadipet) ...	31-3-62	1,148	8	2	10
14.	Guruvappanaicken palayam (Villianur) ...	22-4-62	567	6	2	8
15.	Vambupet (Mannadipet).	16-8-64	381	8	2	10
Total ...				120	30	150

Data Collection :

Data were collected Bureau. Two different set non-users, were set for the physical and financial targets. Plans were also obtained

Findings of the study :

General : As the four are scattered, the problems have their own peculiar depended on four different of the Government Electricity supply of power were and Mahe regions. The the Pondicherry area is Board. The thermal erected by the ex-French has since been closed down

In Karaikal, power Supply Company, which Electric Supply Corporation Supply Company was ment in December 1967, schemes in the region was not able to extend the and as it was felt that to give to greater efficient scheme. The demand of the First Plan rose to 780 KVA., by the end of industries in the area and The entire power consumed

The West Coast Electricity ing power from the Kerala ing power in the Mahe region

Data Collection :

Data were collected by the Statistical Inspectors of this Bureau. Two different schedules one for users and the other for non users, were set for this purpose. Additional particulars on the physical and financial targets and achievements in the Five Year Plans were also obtained from the Electricity Department.

Findings of the study :

General : As the four regions comprising the Union Territory are scattered, the problems of power development in each region have their own peculiar characteristics. The four regions also depended on four different sources of supply. The activities of the Government Electricity Department with regard to supply of power were confined to the Pondicherry, Karaikal and Mahe regions. The entire requirements of power in the Pondicherry area are met by the Tamil Nadu Electricity Board. The thermal power station of 4,900 Kw capacity erected by the ex-French Government in 1951 at Pondicherry, has since been closed down.

In Karaikal, power was supplied by the Karaikal Electric Supply Company, which purchased power from the South Madras Electric Supply Corporation in Tamil Nadu. The Karaikal Electric Supply Company was taken over by the Pondicherry Government in December 1967, since the progress of rural electrification schemes in the region was rather slow and the private licensee was not able to extend the transmission to non-electrified villages and as it was felt that departmental management will be conducive to greater efficiency and speed in the execution of the scheme. The demand which was 352 Kw. in this area at the end of the First Plan rose to 426 Kw. by the end of Second Plan and 780 KVA, by the end of the Third Plan. There are very few industries in the area and practically no agricultural consumption. The entire power consumed is for domestic and street lighting.

The West Coast Electric Supply Corporation which was buying power from the Kerala State Electricity Board was distributing power in the Mahe area. The Board has acquired the assets

of the company in the adjacent Kerala town. Therefore the company was confining its supply to Mahe only. As Mahe is a small area of operation which is not adequately remunerative, the company was not showing any interest in power development there. Hence, this company was taken over by the Pondicherry Government on 1-10-1968.

In so far as Yanam is concerned, power is supplied by the Andhra Pradesh Electricity Board.

Pondicherry Region :

Growth of demand : The total demand of power which stood at 2,202 Kw., at the end of the First Plan period rose to 7,026 Kw., by the end of the Second Plan. By the end of the Third Plan period the demand for power in Pondicherry was actually 12,420 Kw., as against the Plan forecast of 16,000 Kw., (20,000 KVA). This was due to the fact that the Tamil Nadu Electricity Board had frozen this Administration's total demand at 15,000 KVA. The Administration, therefore, had to impose restriction on the hours of working of irrigation pumpsets etc., to keep the demand down to the permitted limit. The increase in demand is mainly due to the location of a large number of industries and utilisation of power for irrigation. The Tamil Nadu Electricity Board delivers power at two points. The first point is at Villianur where there is a 110 Kv/22 Kv., sub-station, with a transformer capacity of 30,000 KVA. The second point of delivery is at Manamedu where the capacity is 5,000 KVA.

Growth of consumption : The number of units of electricity consumed increased from 3.91 million Kwh., in 1954-55 to 50.89 million Kwh., by the end of the Third Plan. The per-capita consumption of electricity rose from 16.1 Kwh., in 1955 to 196 Kwh., by the end of the Third Plan. The increase in consumption was mainly due to the growth of industries. About 50 per cent of the total consumption is under this sector. About 37 per cent is taken up by lift irrigation.

Rural electrification : The progress of rural electrification in Pondicherry area has been very satisfactory. All the villages had been covered by the end of the Third Plan. The supply of power in the rural areas has been mainly for irrigation, public lighting and public water supply.

The following table sets out the details on progress of Rural Electrification in Pondicherry region.

S. No.	Particulars	Position as on 1-11-54	Position at the end of I Plan	Position at the end of II Plan	Position at the end of III Plan	Position as on 31-3-69
1	2	3	4	5	6	7
1.	Number of towns and villages electrified ...	42	57	140	179	179
2.	Number of consumers ...	3,151	3,682	8,006	16,471	21,324
3.	Street lights ...	798	2,069	5,415	9,412	9,522
4.	Connected load (in Kw.)	4,167	11,285	22,301	41,391	51,139

From the above table it may be seen that the achievements under Rural electrification programme in Pondicherry region are quite commendable. The number of electrified villages on 1-11-1954 (date of *de facto* transfer) was only 42. This increased to 179 (Revenue village—177+Towns—2=179) by the end of Third Plan. The number of consumers and street lights which were 3,151 and 798 respectively on 1-11-1954 rose to 21,324 and 9,522 on 31-3-1969. Particularly the number of agricultural connections which was 267 in 1954-55 increased to 4,163 in 1968-69.

The targets and achievements under the Rural Electrification Programme for the three Plan periods are given in the following table.

S. No.	Particulars	I Plan	II Plan	III Plan	From 1-4-66 to 31-3-69
1	2	3	4	5	6
1.	Number of villages electrified:				
	Target ...	—	59	38	—
	Achievements ...	13	83	39	—

1	2	3	4	5	6
2. Connecting up consumers :					
Target	---	---	2,000	500	600
Achievements	---	494	3,176	6,315	4,596
3. Street-lighting					
Target	---	---	1,200	1,500	700
Achievements	---	1,271	3,346	3,997	2,289
4. Agricultural load :					
Achievements (Kw.)	---	84	5,953	10,870	4,956
5. Industrial load :					
Achievements (Kw.)	---	240	1,230	3,015	5,835
6. Total financial provision for rural electrification (Rs.)					
	N.R.	57,93,000	68,57,000	62,44,000	
7. Total actual expenditure					
	8,56,200	54,96,900	67,20,100	54,45,900	
8. Percentage of item 7 to item 6					
	---	---	94.8 %	98.0 %	87.2 %

From the above table it may be seen that in respect of villages electrified, number of consumers and street lights, the achievements are actually far in excess of the targets. In terms of financial achievements it will be observed that 95% and 98% of the total provision for rural electrification programme were spent during the II and III Plan periods respectively. The percentage of utilisation during the annual plan years 1966-69 was 87%.

Findings of the survey :

A village having electricity may not necessarily have all categories of load agricultural, industrial, commercial, domestic and street-lighting. The growth of electrification should, therefore, be analysed also from the angle of development of different categories of connected load. The following paragraphs deal with the extent to which the 15 sample villages which covered by electricity had different categories of load.

Sl No.	Particulars	Number of villages covered	
1	2	3	
1.	Domestic load	...	15
2.	Agricultural load	...	12
3.	Commercial load	...	11
4.	Industrial load	...	1
5.	Street lighting load	...	15
Total number of sample villages		...	15

From the above table it may be seen that all the 15 sample villages under study have got domestic and street-lighting load, 12 villages have got agricultural load, 11 villages commercial load and only one village has got industrial load.

It is not enough to examine coverage at the village level. Since the ultimate user of electricity (for most purposes) is the household, an assessment of coverage should also be attempted in terms of the number of consumers in each village.

S. No.	Name of village	Date of electri- fication	Population of the village (1961 Census)	Number of Consumers
1	2	3	4	5
1.	Muthirapalayam	Prior to 1949	1,413	136
2.	Pudukuppam	do.	226	62
3.	Karayamuthur	16-7-56	1,452	114
4.	Veera Ragava Mudali Thottam.	19-8-57	1,282	32
5.	Vadamangalam	31-12-57	221	18
6.	Podusaram	9-11-59	1,515	41
7.	Kuruvinatham	28-3-60	1,810	111

1	2	3	4	5
8.	Podupet	16-5-60	509	29
9.	Kottupalayam	16-5-60	162	5
10.	Kadathur	30-3-61	748	1-2
11.	Sivaranthagam	1-12-61	624	24
12.	Kizhur	19-1-62	427	36
13.	Sellipet	31-3-62	1,148	46
14.	Guruvappa Naicken Palayam	22-4-62	576	6
15.	Vambupet	16-8-64	381	43

Distribution of sample user-households by category of load :

The following table shows the distribution of the sample user-households according to purposes. A household using electricity for more than one purpose has been counted under each of the purposes ; and to this extent there is more than single counting of the figures. Hence, the total of cols. 4 to 7 is sometimes greater than col. 3.

TABLE 3—Distribution of sample households by category of load

Sl. No.	Name of village	Number of sample households using electricity				
		Any one or more uses	Domestic	Agricultural	Commercial	Industrial
1	2	3	4	5	6	7
1.	Muthirapalayam	8	7	3	2	—
2.	Podusarnam	3	8	—	—	—
3.	Kuruvinatham	8	4	8	—	—

1	2	3	4	5	6	7
4. Podukuppam		8	7	6	—	—
5. Vambupet		8	7	5	—	—
6. Sellipet		8	6	8	—	—
7. Podupet		11	11	—	—	—
8. Kottupalayam		5	5	1	1	—
9. Sivaranthagam		7	4	7	—	—
10. Karayambuthur		8	8	5	1	—
11. Vadamanigalam		9	2	9	—	—
12. Kizhur		10	6	9	—	—
13. V. R. M. Thottam		8	8	—	—	—
14. Kodathur		8	6	7	1	2
15. G. N. Palayam		6	6	2	—	—
Total		120	95	70	5	2
Percentage		100.0	79.1	58.3	4.1	1.1

From the above table it may be seen that the maximum percentage of users in the sample is for domestic purposes, (79.1%) followed by agricultural use (58.3%). The percentage of users for commercial and industrial purposes is 4.1% and 1.1%, respectively.

Average monthly consumption of electricity per sample household in 1968-69: From the angle of the benefits attained, consumption per households is a good indicator for assessing the extent of utilisation of electricity in each sample village. To this end, Table 5 presents data on electricity consumption of sample households by categories of load.

TABLE 4—Average monthly consumption of electricity per sample household in 1968-69.

Sl. No.	Name of village	No. of sample households using elect.	Total monthly consumption of sample households in the village (Kw.)					Average monthly consumption per household (Kw.)
			Domestic	Agricultural	Commercial	Industrial	Total	
1	2	3	4	5	6	7	8	9
1.	Muthirapalayam ...	8	78	7,843	169	—	8,090	1,011.2
2.	Puthasaram ...	8	115	—	—	—	115	14.4
3.	Kuruvinatham ...	8	68	6,225	—	—	6,293	786.6
4.	Pudukuppam ...	8	104	5,400	—	—	5,504	688.0
5.	Vambupet ...	8	128	10,500	—	—	10,628	1,328.5
6.	Sellipet ...	8	85	10,600	—	—	10,685	1,335.6
7.	Podupet ...	11	184	—	—	—	184	16.7
8.	Kottupalayam ...	5	75	500	29	—	604	120.8
9.	Sivaranthagam ...	7	71	13,000	—	—	13,071	1,867.3
10.	Karayambuthur ...	8	232	5,750	58	—	6,040	755.0
11.	Vadamangalam ...	9	40	5,850	—	—	5,890	654.4
12.	Kizhur ...	10	108	10,300	—	—	10,408	1,040.8
13.	V. R. M. Thottam ...	8	351	—	—	—	351	43.9
14.	Kodathur ...	8	335	35,850	727	1,665	38,577	4,822.1
15.	G. N. Palayam ...	6	104	2,200	—	—	2,304	384.0
	Total ...	120	2,078	1,14,018	983	1,665	1,18,744	—
	Average per village ...	8	138.5	7,601.7	65.5	111.0	7,916.2	989.5

It may be seen that the total monthly consumption of the sample households per village is 7,916.2 Units. Out of this, 7,601.2 units or 96% is for agricultural purpose, 158.5 units or 1.7% for domestic use, 65.5 units or 0.8% for commercial use and 111.0 units or 1.4% for industrial use. The average monthly consumption per sample household per village is 989.5 units. It is highest (4,822.1 units) in Kodathur and lowest (14.4 units) in Pulusaram.

Distribution of sample user-households by occupation :

The following table deals with the distribution of sample households by occupation.

TABLE 5—Distribution of sample households by occupation

Sl. No.	Occupation	Number of sample user-households	Percentage to total
1	2	3	4
1.	Cultivators	84	70.0
2.	Traders and Shopkeepers	4	3.3
3.	Mill workers	8	6.7
4.	Artisans	2	1.7
5.	Other Industries	2	1.7
6.	Others	16	13.3
7.	No occupation	4	3.3
	Total	120	100.0

It may be found that cultivators constitute by far the highest percentage (70%) of the electricity users while the mill workers form 6.7%. Traders and shopkeepers account for 3.3%.

Holding size of agricultural users :

As 70.0 per cent of the electricity users are cultivators and the size of holding is a good indicator of their economic status, it would be meaningful to examine the distribution of cultivator users of electricity in terms of their size of holding. The following table shows, for the sample villages, the distribution of the owners of electric pumpsets for irrigation by their size of holding.

TABLE 6—Distribution of sample households owning electric pumpsets for irrigation by size of holding.

Sl No.	Size of holding (acres)	Number of sample households	Number of households owning electric pumpsets	Percentage to total
1	2	3	4	5
1.	Nil	31	—	—
2.	0.01 — 2.50	19	12	17.1
3.	2.51 — 5.00	36	27	38.6
4.	5.01 — 7.50	8	5	7.1
5.	7.51 — 10.00	10	10	14.3
6.	10.01 — 15.00	7	7	10.0
7.	15.01 — 20.00	2	2	2.9
8.	20.01 — 25.00	2	2	2.9
9.	25.01 — 50.00	3	3	4.3
10.	50.01 — 100.00	1	1	1.4
11.	Above 100	1	1	1.4
Total		120	70	100.0

From the above table it may be found that, out of 120 sample households, 70 have got electric pumpsets for irrigation. 17.1 per cent of electric pumpset owners had holdings of less than 2.50 acres, 38.6 per cent had holdings ranging between 2.50 and 5.00 acres, 21.4 per cent had holdings between 5 and 10 acres and 22.9 per cent had holdings of more than 10 acres.

Impact of electrification on agriculture: In the following paragraphs, an attempt is made to assess the extent of area irrigated by electric pumpsets and study the impact of rural electrification on agriculture under the following heads:

- (i) change in irrigated area due to lift irrigation through electricity.
- (ii) change in the cropping pattern and introduction of new crops and
- (iii) release of human and bullock labour previously used for lifting irrigation water through traditional methods.

Extent of irrigation by electric pumpsets: The following table gives data on the average area irrigated per pumpset and other connected particulars like the Horse-power of the pumpset etc.

TABLE 7—Area irrigated per electric pumpset in the sample villages.

Sl. No.	Name of village	No. of electric pumpsets owned by sample households	Average H. P. per pumpset	Average area irrigated per pumpset	Average area irrigated per H. P. of pumpset.
1.	2	3	4	5	6
1.	Muthirapalayam	4	7.3	7.2	0.98
2.	Pudusaram	-	-	-	-
3.	Kuruvinatham	10	5.0	4.2	0.83
4.	Pudukuppam	7	5.7	5.7	1.00
5.	Vambupet	8	8.8	25.0	2.95
6.	Sellipet	9	7.2	3.8	0.53
7.	Pudupet	-	-	-	-

1	2	3	4	5	6
8. Kottupalayam	...	2	2.5	4.0	1.60
9. Sivaranthagam	...	10	7.5	10.7	1.43
10. Karayambuthur	...	9	6.9	10.0	1.44
11. Vadamangalam	...	11	5.4	3.5	0.65
12. Kizhur	...	11	7.0	5.8	0.82
13. V. R. M. Thottam	...	-	-	-	-
14. Kodathur	...	33	8.1	6.1	0.76
15. G. N. Palayam	...	2	5.0	8.0	1.60
Total	...	116	-	-	-
Average per village	...	9.6	7.0	7.5	1.07

The average area irrigated per pumpset varied from 3.5 acres in Vadamangalam to 25 acres in Vambupet. The average horse-power of the pumpset in the latter is 8.8 as against 5.4 in the former. The average area irrigated per horse-power of pumpset shows a much smaller range of variation from 0.53 acre in Sellipet to 2.95 acres in Vambupet.

Change in irrigated area on account of electric lift irrigation :

An assessment of change in the irrigated area consequent on electrification has been attempted on the basis of the data collected from the sample households. The following table gives figures of sample households owning electric-pumpsets etc., and the index of change in their irrigated area with the area irrigated before electric lift irrigation as base (100).

TABLE 8—Extent of change in irrigated area of the sample households resulting from electric lift irrigation.

Sl. No.	Name of village	Total No. of sample households	Number of sample households owning electric pumpsets	Household reporting increase in irrigated area		Average irrigated area per household (acres)		Average increase in irrigated area as % age of cultivation holding	Index of change in irrigated area $100 \times \text{col. 8}$ col. 7
				Number	%-age of col. 5 to col. 4	Before L.I.	After L.I.		
1.	Muthirapalayam	... 8	3	2	66.6	2.0	4.5	3.9	225.0
2.	Pudusaram	... 8	—	—	—	—	—	—	—
3.	Kuruvinatham	... 8	8	5	62.5	3.9	4.9	10.2	125.6
4.	Pudukuppam	... 8	6	6	100.0	4.8	6.6	15.7	137.5
5.	Vambupet	... 8	5	4	80.0	21.7	25.0	1.9	115.2
6.	Sellipet	... 8	8	4	50.0	3.5	5.8	16.4	164.8
7.	Pudupet	... 11	—	—	—	—	—	—	—
8.	Kottupalayam	... 5	1	1	100.0	6.0	8.0	12.5	133.3
9.	Sivaranthagam	... 7	7	6	85.7	11.7	14.3	5.6	122.8
10.	Karayambuthur	... 8	5	3	60.0	15.0	22.6	4.0	150.6
11.	Vadamangalam	... 9	9	6	66.6	3.4	5.3	19.6	152.8
12.	Kizhur	... 10	9	4	44.4	6.5	9.0	7.1	138.4
13.	V.R.M. Thottam	... 8	—	—	—	—	—	—	—
14.	Kodathur	... 8	7	4	57.1	19.0	30.5	5.4	150.5
15.	G.N. Palayam	... 6	2	2	100.0	4.0	8.0	16.0	200.0
Total		... 120	70	47	67.2	—	—	—	—
Average per village		... 8	5.8	3.9	67.7	8.4	12.0	9.8	142.8

It may be seen that more than two-thirds (67.2%) of the sample households owning electric pumpsets reported an increase in irrigated area as a result of electric lift irrigation. The average area irrigated per household came to 8.4 acres before the installation of electric pumpsets and it rose to 12 acres (i.e., by 42%) after the advent of electric lift irrigation. The increase in the irrigated area works out to an average of 9.8% of the cultivated holdings of the sample households who reported increase.

Impact on cropping pattern : To assess the impact, the sample households were asked if they had introduced some new crop and/or extended area consequent on the introduction of electric pumping and if so, the area covered by those in absolute terms and as percentage to their cultivated holding. The following table summarises the responses of the sample households.

TABLE 9-Extent of introduction of new crops by sample households
due to electric lift irrigation.

Sl. No.	Name of village	No. of sample house- holds owning electric pump sets	Households reporting intro- duction of new crops		Households reporting intro- duction of new crops and increase in irriga- ted area		Area brought under new crops	
			Number	Percen- tage to Col. (3)	Number	Percen- tage to Col. (3)	Average per house- hold (acres)	%-age of area under new crops to cultiva- ted holdings
1	2	3	4	5	6	7	8	9
1. Muthirapalayam	...	3	2	66.6	2	66.6	3.0	11.9
2. Pudusaram	...	-	-	-	-	-	-	-
3. Kuruvinatham	...	8	3	37.5	1	12.5	2.3	14.6
4. Pudukuppam	...	6	5	83.3	5	83.3	1.4	18.4

5. Vambupet	...	5	3	60.0	3	60.0	2.3	3.3
6. Sellipet	...	8	2	25.0	2	25.0	3.0	24.9
7. Pudupet	...	-	-	-	-	-	-	-
8. Kottupalayam	...	1	-	-	-	-	-	-
9. Sivaranthagam	...	7	1	14.2	1	14.2	10.0	4.7
10. Karayambuthur	...	5	3	60.0	3	60.0	4.3	17.5
11. Vadamangalam	...	9	5	55.5	5	55.5	1.6	26.2
12. Kizhur	...	9	3	33.3	3	33.3	3.0	16.0
13. V. R. M. Thottam	...	-	-	-	-	-	-	-
14. Kodathur	...	7	2	28.5	2	28.5	1.5	4.0
15. G. N. Palayam	...	2	-	-	-	-	-	-
Total	...	70	29	41.4	27	38.8	-	-
Average per village	...	5.8	2.4	41.4	2.2	38.8	3.2	14.2

In the 15 villages, 41.4 per cent of the sample households owning electric pumpsets had introduced some new crop or other as a result of electric lift irrigation. The average area brought under these crops was 3.2 acres per household, which worked out to 14.2 per cent of the cultivated area of the households reporting introduction of new crops. The table also reveals that 38.8 per cent of the owners of electric pumpsets reported both the introduction of new crops as well as increase in irrigated area, while 41.4 per cent reported only the introduction of new crops.

Details of the crops which had been newly introduced by the sample households are given in the following table.

TABLE 10—*Distribution of sample households reporting introduction of new crops by the name and category of crops.*

Sl. No.	Name of crop	Number of households reporting introduction of the crop	Percentage to total
1	2	3	4
<i>A. Cereal crops :</i>			
1.	Paddy	10	13.0
2.	Ragi	11	14.3
3.	Cumbu	8	10.4
4.	Pulses	—	—
5.	Others	—	—
<i>B. Cash crops :</i>			
1.	Sugarcane	35	45.5
2.	Groundnut	9	11.7
3.	Cotton	3	3.8
4.	Others	—	—
<i>C. Vegetables</i>		1	1.3
<i>D. Fruits</i>		—	—
<i>E. Miscellaneous</i>		—	—
Total		77	100.0

The total of households (77), in the above table exceeds the net actual number of respondents who had introduced new crops (29) as households introducing two or more crops have been counted separately under each crop. Cash crops account for the largest proportion (61%) of the households introducing new crops. Sugarcane appears to be the most popular (45.5%) among the "new-crop" households. Next in importance to sugarcane are paddy and ragi, the introduction of which was reported by 13% and 14.3%, respectively of the "new-crop" households.

Release of bullock labour :

Another significant result of the introduction of electric lift irrigation is the reduction in the use of bullocks for irrigation. With the use of electricity the employment of bullock labour for lift irrigation is dispersed with completely and side-by side the requirement of man power gets reduced considerably. The following table furnishes data on the per centage of sample households owning electric pumpsets, who reported release of bullock labour as a result of electric lift irrigation.

TABLE 11—Percentage of sample households reporting release of bullock labour as a result of electric lift irrigation.

Sl. No.	Name of village	No. of sample households owning electric pumpsets.	Households reporting release of bullock labour.	
			Number	Percentage of Col. 4 to Col. 3
1	2	3	4	5
1.	Muthirapalayam	3	1	33.3
2.	Pudusaram	—	—	—
3.	Kuruvinatham	8	3	37.5
4.	Pudukuppam	6	2	33.3
5.	Vambupet	5	1	20.0
6.	Sellipet	8	4	50.0
7.	Pudupet	—	—	—
8.	Kottupalayam	1	—	—

1	2	3	4	5
9.	Sivaranthagam	...	7	—
10.	Karayambuthur	...	5	1
11.	Vadamangalam	...	9	4
12.	Kizhur	...	9	4
13.	V. R. M. Thottam	...	—	—
14.	Kodathur	...	7	1
15.	G. N. Palayam	...	2	—
Total		...	70	21
Average per village		...	5.8	1.8
				30.0
				30.0

It may be seen that 30 per cent of the sample respondents reported release of bullock labour.

Besides the question of extent of irrigation from power-pumps and the extent of coverage by new crops, the respondents were also asked about the effects on agriculture, resulting from electric lift irrigation. The responses are presented in the following table.

TABLE 12—Distribution of sample households owning electric pumpsets by the nature of benefits derived from electric lift irrigation.

Sl. No.	Nature of benefit	No. of house-holds reporting benefit	Per-centage to total
1	2	3	4
<i>I. Improvement of irrigation :</i>			
1.	Easy and better irrigation	...	2
2.	Intensive irrigation	...	42
<i>II. Impact on cropping :</i>			
1.	Increase in area under cultivation	...	6
2.	Double cropping	...	45
3.	Change in cropping pattern	...	36

1	2	3	4	
III. Financial benefits :				
1.	Reduction in cost of irrigation	...	2	1.1
2.	Increase in returns	...	38	22.0
3.	Sale of water	...	2	1.1
Total		...	173	100.0

The largest proportion of beneficiary households reported impact on cropping (50.3%) as the main benefit, quoting particularly double cropping (26%). About one-fourth (24.4%) of the responses refer to intensive irrigation as another important benefit. Another 24.2% suggest financial benefits resulting either from increased agricultural return or reduced cost of irrigation or from receipts of sale of water.

Effect on working time-schedule :

Electrification of the house may affect the working time of the rural people for the gainful activity undertaken within the premises. Electric lift irrigation may also affect the time-schedule of work done on the field.

The following table shows the percentage of households reporting increase in working time because of electrification.

TABLE 13—Percentage of sample households reporting increase in working time due to electricity.

Sl. No.	Name of village	No. of sample households using electricity	Households reporting increase in working time	
			Number	Percentage of col. (4) to col. (3)
1	2	3	4	5
1.	Muthirapalayam	...	8	100.0
2.	Podusaram	...	8	100.0
3.	Kuruvinatham	...	5	62.5

1	2	3	4	5	
4.	Pudukuppam	...	8	8	100.0
5.	Vambupet	...	8	8	100.0
6.	Sellipet	...	8	7	87.5
7.	Pudupet	...	11	10	90.9
8.	Kottupalayam	...	5	3	60.0
9.	Sivaranthagam	...	7	6	85.7
10.	Karayambuthur	...	8	8	100.0
11.	Vadamangalam	...	9	7	77.7
12.	Kizhur	...	10	8	80.0
13.	V. R. M. Thottam	...	8	8	100.0
14.	Kodathur	...	8	5	62.5
15.	G. N. Palayam	...	6	4	66.6
Total		...	120	103	85.0
Average per village		...	8	6.8	85.0

For all the sample villages taken together, 103 households (85 per cent of electricity users) reported increase in working time while 17 households (15 per cent) reported "no change".

Effect of electrification on reading habit :

The respondents having the benefit of electricity (domestic use) were asked whether the reading habit has increased or remained the same as compared to the position before electrification. The responses are presented in the following table.

TABLE 14—Percentage of sample households reporting change in reading habits

Sl. No.	Name of village	Number of sample households having domestic connection.	Households reporting increase in reading habits.	Percentage of Col. (4) to Col. (3)
1	2	3	Number	4
1.	Muthirapalayam	...	7	6
2.	Pudusaram	...	8	6

1	2	3	4	5	
3.	Kuruvinatham	...	4	4	100.0
4.	Pudukuppam	...	7	7	100.0
5.	Vambupet	...	7	7	100.0
6.	Sellipet	...	6	6	100.0
7.	Pudupet	...	11	9	81.8
8.	Kottupalayam	...	5	4	80.0
9.	Sivaranthagam	...	4	2	50.0
10.	Karayambuthur	...	8	7	87.5
11.	Vadamangalam	...	2	2	100.0
12.	Kizhur	...	6	6	100.0
13.	V. R. M. Thottam	...	8	8	100.0
14.	Kodathur	...	6	6	100.0
15.	G. N. Palayam	...	6	4	66.6
Total		...	95	84	88.8
Average per village		...	6.3	5.6	88.8

Out of 95 respondents having domestic connection 84 (88.8 per cent) reported increase in reading habit. Domestic connection helps in promoting the reading habit among members of the household, but is not the only factor determining it.

Delay in getting connections :

The time-lag between the dates of submitting the application and getting the connection has been analysed for the different categories of load. The data are indicated in the following table.

TABLE 15—Distribution of users according to time-lag in getting electric connection.

Sl. No.	Particulars	Number of users					Percentage of col. (7) to total sample users (172).
		Domestic	Agricultural	Commercial	Industrial	Total	
1	2	3	4	5	6	7	8
1.	Within 15 days	29	21	2	1	53	30.8
2.	Above 15 days but within 1 month.	37	24	2	1	64	37.2
3.	Above 1 month but within 2 months.	13	5	-	-	18	10.5
4.	Above 2 months but within 3 months.	3	-	-	-	3	1.7
5.	Above 3 months	13	20	1	-	34	19.8
Total		95	70	5	2	172	100.0

It may be seen that time-lag ranges between one and two months in 18 cases (10.5%), above two months but within three months in 3 cases (1.7%) and above three months in 34 cases (19.8%).

The details of tariff rates by type of

Details of Tariff

Sl. No.	Items	Slab-I		Slab-II
		Specification	Rate	Specification
1	2	3	4	5
1. (a) Domestic lighting,		First 50 Units/month.	30 paise/unit.	Next 50 units/unit.
(b) Domestic bulk supply,		Energy charges overall.	11 paise/unit.	—
2. Agricultural use		Over all rate for agricultural services with a C. L. of not less than 3 H. P.	8.25 paise/unit.	
3. Industrial				
(a) Small		Over all rate	22 paise/unit.	
(b) Medium		First 2,000	12 paise/unit.	All in excess

use are given in the following table:-

rates by type of use

Slab-III			Remarks
Rate	Specification	Rate	
6	7	8	9
25 paise/ unit.	All in excess	22 paise/ unit.	Power load (connected and utilised load) should not be less than 1,000 Watts. Fixed monthly charge per service Rs. 11 for the 1st 2 Kws. or part thereof of C. L. in lights and fans and radios only and Rs. 6 for each addi- tional Kw. or part thereof.
—	—	—	Tariff guarantee of Rs. 17-50 per H.P./Annum.
11 paise/ unit.			This comes under combined power and lighting monthly minimum charge Rs. 2-50/ H. P. or part thereof.

1	2	3	4	5
4. Commercial	First 100 units/ month.	34 paise/ unit.	Next 400 units	
5. Street lights	Total monthly burning hours : 200.	Av. rate 17 paise/ unit		
6. Others: (Specify)				
(a) High Ten- sion supply Tariff-I.	First 50,000 units.	6 paise/ unit.	Next 50,000 units.	
Plus rate/KVA of M.D. month.	For the first 500 KVA.	Rs. 8.00/ KVA.	Next 500 KVA.	

Note :— The above tariff does not

6	7	8	9
32 paise/ unit	Next 2,000 units	30 paise/ unit	<i>Slab-IV.</i> All in excess 26 paise/unit. Monthly mini- mum charges Rs. 2-50.
5.75 paise/ unit.	Next 2,00,000 unit.	5.25 paise/ unit.	Next 5,00,000 units at 4-50 paise/unit.
		For the excess above.	8 lakhs at 4 paise/unit.
Rs. 7.00/ KVA.	For the excess above 1,000 KVA.	Rs. 6 per KVA.	

H. T. Supply to non-Industrial establishment such as Corporations, Hospitals, Educational Institutions etc., the tariff for this category will be as per tariff for H.T.—1 increased by 20%.

Respondents' views on tariff rates, minimum charges and manner of payment of electric charges :

In the course of the enquiry, respondents were asked if they considered the tariff rates and minimum charges high or reasonable. The following table gives the distribution of sample households reporting tariff rates as high, minimum charges not reasonable and monthly payment not convenient, by category of load.

TABLE 16—Opinion of users about minimum charges, tariff rates and manner of payment.

Sl. No.	Category of load	Total No. of users in the sample	Number reporting that minimum charges are high	Number reporting that tariff rates are high	Number reporting that the monthly payment is not Convenient
1	2	3	4	5	6
1.	Domestic ...	95	46	78	28
2.	Agricultural..	70	31	56	21
3.	Commercial..	5	2	2	3
4.	Industrial ...	2	—	1	1
Total ...		172	79	137	63
Percentage...		100.0	45.9	79.6	36.6

Taking all categories of load together, 79.6 per cent of the sample consumers reported that the prevailing tariff rates of electricity were high, 45.9 per cent considered the minimum charges as high and 36.6 per cent of consumers expressed difficulty in paying electric charges monthly. Most of the consumers who reported difficulty in monthly payment considered quarterly payment as more convenient. They have also felt that the collection may be made in the village itself.

Contribution to total consumption and to total revenue by categories of load :

The following table deals with the contribution to total consumption and to total revenue by the different classes of load in 1955-56, 1960-61, 1965-66 and 1968-69.

S. No.	Category of load	1955-56	1960-61	1965-66	1968-69
1	2	3	4	5	6
1.	Agricultural (C)	13,81,000	61,31,254	1,87,43,546	2,69,83,322
	(R)	—	6,01,547	15,78,896	25,63,333
2.	Industrial (C)	16,09,000	1,37,58,436	2,54,46,158	3,54,51,697
	(R)	—	15,56,571	21,24,687	31,20,138
3.	Domestic (including commercial) (C)	25,71,000	32,26,739	58,22,734	73,42,441
	(R)	—	9,61,308	17,47,040	24,23,511
4.	Street lights (C)	2,75,000	6,56,014	8,94,353	7,17,345
	(R)	—	1,62,204	4,22,745	3,75,617
TOTAL	(C)	58,36,000	2,37,72,443	5,09,06,791	7,04,94,805
	(R)	—	32,81,630	58,73,368	84,82,599

Percentage contribution to total consumption and to total revenue by categories of load :

S. No.	Category of load	1955-56	1960-61	1965-66	1968-69
1	2	3	4	5	6
1.	Agricultural (C)	23.66	25.79	36.81	38.27
	(R)	—	18.33	26.88	30.22
2.	Industrial (C)	27.57	57.87	49.98	50.28
	(R)	—	47.43	36.17	36.78
3.	Domestic and commercial (C)	44.05	13.57	11.43	10.40
	(R)	—	29.29	29.74	28.56
4.	Street light (C)	4.72	2.77	1.78	1.05
	(R)	—	4.95	7.21	4.44
TOTAL	(C)	100.00	100.00	100.00	100.00
	(R)	—	100.00	100.00	100.00

C—Consumption. R—Revenue.

From the above table it may be seen that the industrial load accounted for the maximum consumption (about 50%) throughout except in 1955-56 when the maximum consumption is by the domestic and commercial loads. Next in order of quantum of consumption comes the "agricultural load". Domestic and commercial load ranks third while "street lighting" accounts for a small percentage.

Regarding the trend in the quantum of consumption (unit consumed) by the different classes of load, we can notice an increasing trend in all the cases. But when percentage figures are considered a decreasing trend is noticed in the case of domestic load and street lighting load.

As regards revenue, the maximum contribution is by the industrial load. It may also be seen that while the domestic load and street lighting load were contributing to the revenue more than their percentage share on the basis of consumption, agricultural load and industrial load were contributing less than their relative share on the basis of consumption.

Street lights :

All the 15 sample villages were provided with street-lights. The reaction of the respondents in almost all the villages at the time of enquiry regarding electric street-lights was that the number of street-lights was inadequate. Further, all the points provided for lights were not lighted. Instances of non replacement of fused bulbs were also reported. 80 per cent of sample households reported that street-lights are not adequate and 78.7 per cent reported poor maintenance of street-lights.

TABLE 17—*Opinion of samp's households regarding adequacy of street lights.*

Sl. No.	Name of village	No. of sample households (users & non-users)	Number of households reporting that street lights are			
			Ade-quate	Not adequate	No opinion	
1	2	3	4	5	6	
1.	Muthirapalayam	...	10	2	8	—
2.	Pudusaram	...	10	—	10	—
3.	Kuruvinatham	...	10	3	7	—
4.	Pudukuppam	...	10	8	2	—
5.	Vambolpet	...	10	—	8	2
6.	Sellipet	...	10	—	10	—
7.	Pudupet	...	13	—	13	—
8.	Kottupalayam	...	7	—	7	—
9.	Sivaranthagam	...	9	—	9	—
10.	Karayambuthur	...	10	6	4	—
11.	Vadamangalam	...	11	1	9	1
12.	Kizhur	...	12	2	10	—
13.	V. R. M. Thottam	...	10	1	7	2
14.	Kodathur	...	10	2	8	—
15.	G. N. Palayam	...	8	—	8	—
Total		...	150	25	120	5
Percentage		...	100.0	16.7	80.0	3.3

TABLE 18—*Opinion of sample households about maintenance of street-lights.*

Sl. No.	Name of village	Number of households (users and non-users)	Poor maintenance	Good maintenance	No opinion	
1	2	3	4	5	6	
1.	Muthirapalayam	...	10	10	—	—
2.	Pudusaram	...	10	5	5	—
3.	Kuruvinatham	...	10	7	3	—
4.	Pudukuppam	...	10	4	2	4
5.	Vambupet	...	10	5	—	5
6.	Sellipet	...	10	8	—	2
7.	Pudupet	...	13	13	—	—
8.	Kottupalayam	...	7	7	—	—
9.	Sivaranthagam	...	9	9	—	—
10.	Karayambuthur	...	10	7	3	—
11.	Vadamangalam	...	11	9	—	2
12.	Kizhur	...	12	11	—	1
13.	V. R. M. Thottam	...	10	6	1	3
14.	Kodathur	...	10	9	1	—
15.	G. N. Palayam	...	8	8	—	—
Total		...	150	118	15	17
Percentage		...	100.0	78.7	10.0	11.3

Summary of findings

1. The progress of rural electrification in Pondicherry region is very satisfactory. 266 out of 267 census villages in this region have been electrified.

2. The number of consumers and street-lights which were 3,151 and 798 respectively on 1-11-1954 rose to 21,324 and 9,522 on 31-3-1969. Particularly the number of agricultural connections which was 267 in 1954-55 rose to 4,163 in 1968-69.

3. 95% and 98% of the total outlay for rural electrification programme was spent during the II and III Plans respectively. 87% of the provision was spent during the three years from 1-4-1966 to 31-3-1969.

4. All the 15 sample villages have domestic and street-lighting load, 12 villages have agricultural load, 11 villages commercial load and only one village has got industrial load.

5. The maximum percentage of users of electricity in the sample is for domestic use (79.1%) followed by agricultural use (58.3%). The percentage of users for commercial and industrial purposes is 4.1% and 1.1% respectively.

6. The monthly consumption of the sample households varies from 115 units (Pudusaram village) to 38,577 units (Kodathur village). The average per village is 7,916.2 units, 96% of this consumption is for agricultural use, 1.7% for domestic use, 0.8% for commercial use and 1.4% for industrial use.

7. The monthly consumption per sample household varies from village to village. It is highest (4,822.1 units) in Kodathur village and lowest (14.4 units) in Pudusaram. On an average it works out to 989.5 units per village.

8. Cultivators constitute by far the highest percentage (70%) of the electricity users while the mill workers form 6.7%. Traders and shop-keepers account for 3.3%.

9. Out of 120 sample households, 70 households have got electric pumpsets for irrigation. 17.1% of electric pumpset owners had holdings of less than 2.50 acres, 38.6% had holdings between 2.50 and 5.00 acres, 21.4% had holdings between 5 and 10 acres and 22.9% possessed more than 10 acres.

10. The total number of electric pumpsets owned by the sample households is 116. The average area irrigated per pumpset varies from 3.5 acres in Vadamangalam village to 25 acres in Vambupet. The average area irrigated per Horse Power of pumpset shows a much smaller range of variation from 0.53 acres in Sellipet to 2.9% acres in Vambupet.

11. More than two-thirds of the sample households owning electric pumpsets reported increase in irrigated area as a result of electric lift irrigation. The average area irrigated per households rose by 42% (from 8.4 acres to 12 acres) due to electric lift irrigation.

12. 38.8 per cent of the owners of electric pumpsets reported both the introduction of new crops as well as increase in irrigated area as a result of electric lift irrigation. 41.4% reported only the introduction of new crops.

13. Cash crops account for the largest proportion of the households introducing new crops. Sugarcane appears to be the most popular among the new crop households.

14. 31 per cent of the sample households reported release of bullock labour as a result of electric lift irrigation.

15. 50 per cent of beneficiary households reported impact on cropping (double-cropping, change in cropping pattern etc.) as the main benefit derived from electric lift irrigation.

16. 85 per cent of sample users of electricity reported increase in working time and nearly 89 per cent of consumers of domestic lighting reported increase in reading habits.

17. 68 per cent of sample users got electricity connection within one month from the date of application, 12.2 per cent of users got after one month but within three months, and 19.8 per cent got after three months.

18. 79.6 per cent of the sample consumers reported that the prevailing tariff rates of electricity were high, 45.9 per cent considered the minimum charges as high, and 36.6 per cent expressed difficulty in paying electric charges monthly. Most of the consumers who reported difficulty in monthly payment considered quarterly payment as more convenient. They have also felt that the collection may be made in the village itself.

19. Industrial load accounted for the maximum consumption, followed by the agricultural load. Industrial load accounted also for the maximum revenue.

20. 80 per cent of the sample households remarked that the number of street-lights was not adequate. Most of them reported that only alternate points provided for lights were lighted. Instances of non-replacement of fused bulbs were also reported in a majority of the villages.

*Comments/Remarks on evaluation report on "Rural Electrification,
Pondicherry Region"*

1. On page 2, it is indicated that the total number of villages in Pondicherry electrified till the end of 1969 is 266 and that one village (Manalipeth in Mannadipeth Commune) is not electrified. The correct position at the end of 1965 is that all villages (267) in this region were electrified by the end of III Plan—the date of energisation of Manalipeth is 8—6—1966.

2. On page 3, under item 9, Kottupalayam (Oulgaret) should be read as Kattupalayam (Oulgaret).

3. On page 3, under item 14, the population of Guruvappa-naickenpalayam (Villianur) should be corrected to 567 as against 67 indicated.

4. (1) On page 33 under item 2 (Industrial) the consumption for 1955-56 is 15,99,000 as against 16,09,000 indicated. The total is also to be corrected as 58,26,000.

5. On page 37 "266 out of 267 Census Villages" should be read as "267 out of 267 Census Villages".

The evaluation study No. 7 is returned, herewith, in original.

It is felt on a perusal of the evaluation study that the number of sample villages selected at random is not adequate to get at a clear and deeper insight in respect of electrification and its impact on the advent of rural economics. More numbers, say about 25% of the villagers, out of 267 should have been selected for the evaluation as this would enable to assess a clarified version of impact of rural electrification.

Director of Electricity.