



## **An Economic Study on Rural Household Electricity Consumption in Cuddalore District**

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### **Abstract**

This study makes an attempt to analyse the Economic study on Rural Household Electricity consumption in Cuddalore District. In the context of rural energy consumption is based on income and types of house. 100 samples from different occupational category is collected randomly. The analysis is on the basis of income and types of house. This study carried out during the winter period, since climate also plays a vital role in the consumption of electricity.

Keywords: Rural, Energy consumption, Rural Households

### **Introduction**

Energy generally has been simply defined as “the ability or capacity to do work”. Planned industrialisation, economic development, modernisation of agriculture, population growth, and rise in the human standard of living has created a burgeoning demand for energy in India. The availability of adequate supplies of energy is a matter of great concern as it is linked with industrial output and agricultural output. The major energy consuming sectors are industry, transport, agriculture and household. The demand for energy of these sectors is wide and varies from one another. However, their final goal is the same, since all are related to economic development.

Energy demand of the different sectors of Indian economy is met by different sources of energy. These sources of energy are classified into commercial and non-commercial. Commercial sources of energy are one, which commands a price for its utilisation. Coal, petroleum, electric power etc. are the chief commercial sources of energy in India. Non-commercial sources of energy consist of firewood, vegetable wastes and dried dung. These are non-commercial sources of energy in the sense that they are supposed to be free and command no price. Actually, the non-commercial sources such as firewood, dried dung have started commanding a price in urban areas.

Deficiency in physical infrastructure in India is perhaps one of the most acute in the power sector. The per capital consumption of 354 KWh per annum in India is relatively low among the developing countries such as Venezuela (2761 units), Chile (1627 units), Uruguay (1479 units), Brazil (1463 units), Argentina (1438 units) and Mexico (1072 units). In Indian context, in the case of gross annual per capital consumption Goa stands first (1843 KWh), Tamil Nadu is in the Seventh Place (715 KWh) and Bihar occupies the last place (92 KWh). But, after Mr. Nitish Kumar taken the charge of Chief Minister, now the trend has changed.

Electricity becomes an inevitable source of energy at world level. In Indian context, particularly in the context of Tamil Nadu the demand for electricity is an increasing one. And at the same time, the production is purely based on the availability of water, wind and thermal. During summer, due to the hottest climate, the usage of electrical appliances is high that leads to over consumption. Even in the midst of such electricity crisis, large farmers are enjoying the benefits of free electricity instead of the actual beneficiaries (poor farmers). But during the course of summer, the rural people are affected by the electricity cut.



Now, in Tamil Nadu, the rate of electricity has been hiked. It is one the basis of the consumption. After the hike in electricity price, there was a question raised by the researcher. The question is what the quantity of consumption is after the price hike. To probe the same, a study is conducted at the C.Mutlur village of Chidambaram Taluk of Cuddalore district. This price hike is applicable from the month of April 2012. Hence the researcher has taken the reference period for the month of January 2012.

### Methodology

Since, this is the study on economic analysis on rural households' electricity consumption C.Mutlur is taken as a reference area. The reason is the study area is for both residential and agricultural activities. 100 samples have been taken on the basis of their occupation. They are small farmers, marginal farmers, large farmers, and agricultural coolie. Since, this is the study on rural household energy consumption, the usage of electrical appliances at the household level and the types of houses and income of the respondents have been taken for further analysis.

Table 1: Occupational and Income category of the respondents

Sl. No.	Occupational category	Income category				Total
		Up to 20000	20001-30000	30001-40000	40000+	
1.	Agricultural Coolie	21 (65.63)	04 (14.27)	-	-	25 (25.00)
2.	Small farmers	6 (18.75)	14 (50.00)	3 (12.50)	2 (12.50)	25 (25.00)
3.	Marginal farmers	5 (15.62)	8 (28.57)	10 (41.67)	2 (12.50)	25 (25.00)
4.	Large farmers	-	2 (7.14)	19 (45.83)	12 (75.00)	25 (25.00)
	Total	32 (100)	28 (100)	24 (100)	16 (100)	100 (100)

Source: Computed

From the above table it is inferred that out of 100 respondents' 32% are in the income group of up to 20000 followed by 28 (20001-30000), 24 (30001-40000) and 12 (40000+ group). Further, it indicates that maximum respondents' monthly income is less than Rs.20000/- per month that denotes their poverty.

Table 2: Types of house of the respondents

Sl. No.	Types of houses	Income category				Total
		Up to 20000	20001-30000	30001-40000	40000+	
1.	Thatched (with electricity)	27 (84.38)	04 (14.28)	-	-	31 (31.00)
2.	Kutcha (hut with electricity)	5 (15.62)	12 (42.86)	4 (16.67)	1 (6.25)	22 (22.00)
3.	Pucca (concrete building)	-	12 (42.86)	20 (83.33)	15 (93.75)	47 (47.00)
	Total	32 (100)	28 (100)	24 (100)	16 (100)	100 (100)

Source: Computed



Above table indicates that out of 100 respondents' 47 are living in the pucca building, that is all the large farmers (25), 20 marginal farmers and 2 small farmers have the pucca house and 25 agricultural coolies and 6 small farmers have thatched houses with electricity and 5 marginal farmers and 17 small farmers have kutchha house electrified completely. Hence, it is inferred that all the respondents are having the electricity facility.

To find out the usage of electrical appliances Paschim Gujarat Vij Company Limited has given a energy consumption calculator. For example, if a household uses a 100 watts bulb an hour per day at the end of the month 3 units will be consumed.

For

1. Tube light (40w)/1hr/day = 1.2 units/month
2. Fan (100w)/1hr/day = 2.4 units/month
3. T.V. (200w)/1hr/day = 6 units/month
4. Mixie and Grinder (200w)/1hr/day = 6 units/month
5. Pump motor (740w)/1hr/day = 22 units/month

To calculate the cost, per unit cost before April 2012 has been taken because, the government of Tamil Nadu has hiked the price of electricity from April 2012. The study has been undertaken in the month of January and Feb.2012.

Table.3 Usage of Electric Appliances and Average Units consumed per month

Table 3 explains the usage of electrical appliances and average units consumed by the respondents.

Sl.No	Electric Appliances and Units consumed	Type of Houses		
		Thatched =31	Kutchha = 22	Pucca = 47
1	No. of bulbs	93 (1674)	44 (794)	94 (1692)
2	No. of Tube lights	40 (288)	66 (475.2)	188 (1353.60)
3	T.V	31 (1116)	22 (792)	47 (1692)
4	Grinder	06 (18)	20 (60)	47 (141)
5	Mixer	2 (6)	16 (48)	47 (141)
6	Motor	-	10 (330)	47 (1551)
7	Refrigerator	-	05 (30)	40 (240)
8	Washing Machine	-	08 (168)	47 (989)
	Per month average consumption(Units)/Household	125	148.51	185.85

Source: Computed

Figures in Parentheses represent units of the appliance used

In the case of respondents living in the thatched house, they are using more ordinary bulbs (sixty to hundred watts) to get maximum light. The hours of usage of electrical appliances and the calculation of units consumed have been explained in the methodology. Since, the respondents are in the thatched houses; moreover they belong to the occupational category of agricultural coolie and do not have the



awareness that usage of ordinary bulbs consume more units. Further when compare with other appliances, the cost of ordinary bulbs is much lower than that of the other. That is why the respondents of the thatched houses are buying the ordinary bulbs more than the other. Next to the bulbs, all the respondents have the free TV, dish or the cable. They utilize the TV minimum six hours daily. Hence, the mere consumption of electricity is due to the usage of ordinary bulbs and the TV. The average electricity consumption for the respondents of thatched house is 100.01 units per month.

In the context of kutcha houses the average use of bulb is two per house, hence, the consumption is less than the thatched houses. Here, the average consumption per household is 122.51 units. In the context of pucca house also average use of bulb is two per household, and the number of respondents is more than the other two categories, hence, the more consumption.

Here, the usage of tube light, TV, mixier, grinder, motor and washing machine is more, so, the monthly average consumption of electricity is around 166 units.

The tariff in Tamil Nadu was much lower than the other states before april 2012 due to free electricity, mis and non-maintenance of power stations, subsidy etc. the TNEB faced the loss. To set it right, the government of Tamil Nadu increased the electricity tariffs from April 2012.

Table 4 Average electricity consumption per month

Type of house	Average consumption per month	Cost in rupees	
		Old tariff (Rs.)	New tariff (Rs.)
Thatched N=31	100.01	75.08	120.00
Kutcha N=22	122.51	183.77	281.78
Pucca N=47	165.94	248.91	381.67

Source: Computed

As noted earlier, since, the study has been undertaken during the month of January 12. The use of electricity was less than the other season. Because January is the period of Winter. During the winter season the use of fans, Air cooler, Refrigerator and air conditions are much less. Even, one can say, the use of such appliances is almost zero. In the context of respondents of the thatched houses as per the old tariff, they have to pay Rs.75/- per month (in Tamil Nadu bi-monthly billing or reading system is followed), respondents' of the kutcha houses have to pay Rs.184/- and the respondents' of the pucca house have to pay Rs.249/- per month respectively. During the hot summer, the consumption will be increased bi or tri-fold. Hence, the respondents' struggle to pay their electricity bill during the summer period. Here, another important point to be noted is even after liking up the tariff still the tariff in Tamil Nadu is the lowest among the states of India.

### Findings:

1. Now, the government recommends to use CFL instead of ordinary bulb to reduce the level of consumption and the cost. But 80% of the respondents do not have the awareness about the CFL.
2. Since, the electrical appliances are inevitable, irrespective of their income, the respondents' from all categories consume more than 100 units approximately per month.
3. Out of 100 respondents, almost 90 of them are still using the oldest meters that do not give the right reading. This discrepancy leads to loss both the consumers and the TNEB.



4. In the rural area, due to the lack of infrastructural facilities, loss of electricity occurs during transmission.
5. During the hottest summer, because of the current cut without consumption the poor have to pay the minimum charges.
6. During the period of power failure, for mixing and grinding, the respondents have to go to shops and pay more this purpose. If it continues daily they cannot pay and their day to day life will be paralysed.
7. The current cut is more in rural areas. The study hours of the students are affected.
8. An important finding is weather plays a vital role in the context of power consumption.

### Suggestions

1. The Government should abolish the ordinary bulbs' production
2. The cost of CFL is not affordable by the poor and the medium class people. Even the minimum price is Rs. 75/. Though it has long life than the ordinary bulb, due to higher price and non awareness about it people do not use it.
3. Instead of giving subsidy to electricity, it is better to sell the CFL at the subsidized cost.
4. Free electricity should be only given to the poorest that too people having only two or three electrical points using only the CFL.
5. Old meters should be replaced with digital meter.
6. Promotion of solar energy is needed.
7. To install solar plant subsidy should be given or common solar plant may be established and the minimum charge also be fixed on the basis of the consumption (User pay principle) and this revenue be utilized for maintenance.

### Conclusion

Hence, scarce use of electricity, awareness among the people, people's participation in solar plant establishment are essential and very much needed for the present day context.

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