

Economic Analysis Of Household Energy Consumption Pattern And Energy Management – Special Reference To Selected Household In Chennai City

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Introduction And Methodology

Energy is the significant component required for human beings. The human civilization require some form of energy their vegetation and existence. Accumulation, usage and transmission of the energy has been undergoing serious transformation and now heightened into higher level across India and the manifestation is more among Tamil Nadu. The more urbanized state with adequate industrial progress entails with huge consumption of energy. Energy consumption is utilized as a significant catalogue to postulate and manifestation of the economic and social progress of the state. (Rahman, A. de Castro,1995). In economic theory, energy indicated as significant component of progress dialectics. Theoretically, the modern economists like Schurr and Jorgen professed energy considered as the fifth factor of production along with land, labour, capital and organization. However, the classical economists had not indicated the significance energy and its contribution to economic analysis. Usually, energy is used by almost all economic activities such as agriculture sector, industrial activities, commercial, transport, social, service and household requirement. In addition, all sectoral growth tremendously depend upon the accessibility of sufficient, economical, reliable and unremitting supply of energy carriers of numerous types, along with other economic and social expenditures. Therefore, energy adequately occupies the prime place in the economic sectors as a vital input for progress. (Berglund C. Soderholm P. 2006)

Significance Of Electricity Energy And The Challenges Of State Electricity Boards

Electricity energy plays a noticeable role development dialectics and modern day activities and it is a vigorous ingredient to both industrial development as well as agriculture activities. A challenging feature that impends the very existence of SEBs is the non-remunerative tariff and the subsidies engulfed with it. Electricity supply is the

most necessary service for home to enhance their standard of living. It is a more efficient source of energy for various end-uses due to its high applicability.

Components Of Household Energy

The significance of electricity energy usage largely reliant on the household sector whose consumption of electricity is relatively plays important role. Household sector is one of the main consumers of principal energy in India and normal sources still dictate the sector. India primarily depend on coal, oil and fuel wood for most its energy need. (Matthew J. Holian,2020) The type of fuel used by a household varies with revenue. Low-income group largely reliant on fundamentally on fuel wood, though the middle income group relied on fire wood in urban areas and urban areas on kerosene. The commercial energy consumed by the household sector exhibits that the proportion of electricity has heightened and the proportion of coal and oil has decelerated. Numerous home in urban areas do not have access to extensive range of commercial sources of energy. However, minuscule proportion of slums in the urban areas have relied upon kerosene for lighting purpose. In the same line, frequent restriction and electricity supply is also important lacuna. There are numerous possibilities to cater the end user necessities by both commercial and non-commercial energies. (Petras Punys and Bernhard Pelikan, 2007)

Electricity Energy In India

Electricity is indispensable instrument and essential resource for progressive activities of the country. When the demand for electricity has been escalating consistently along with economic progress of the country, supply is also enhancing correspondingly with the execution of new electricity projects and so the physical performance of State Electricity Board is in improving phase through innovative technology as well as the

prospective of exploration of alternative sources and outcome. In the same line, the affluence of the people in urban areas have propelled the need for home appliances which has been converted into basic necessities from luxurious goods once. (Mukherjee K. 2008) The demand for home appliances entails the escalation of demand for electricity as well. The potentiality of the TNEB in supplying the needed electricity depends on various sources like thermal, hydro, wind energy. Both, public and private players involving in producing electricity.

Tamil Nadu Electricity –A Overview

The total on-grid installed capacity of Tamil Nadu was 30.1 GW, 9% of the total installed in India. Just like the rest of India, the state is severely reliant on on coal-fired generation for its power requirements (45% of capacity, 69% of generation. The installed thermal capacity in Tamil Nadu developed at average 10% annually since 2011. At the same time, and a crucial cause for this report, Tamil Nadu is the leader in India in terms of complete installed renewable energy capacity and generation, particularly wind energy. TN's peak power supply deficit has constantly declined. The major lacuna of the Tamil Nadu electricity board is the provision of electricity for free to the agricultural sector 8% of the customer base by number, but 15% of electricity consumption by volume. This is a key social safety net for farmers hit with significant cost inflation and regularly depressed output prices, not to mention the vagaries of monsoonal floods and drought. However, it also means that TANGEDCO has to cross-subsidize this sector with revenues from the commercial and industrial (C&I) sector, which consume 46% of total electricity. However, the C&I sector can increasingly use rooftop solar and behind-the-meter generation to go off grid or at least materially reduce consumption in the face of high and rising tariffs (Rs7-8/kWh). TANGEDCO needs to reduce its AT&C losses, lower generation costs and leverage its positive demand growth profile to work with its C&I customers so as to avoid following the behind-the-meter generation trends increasingly evident in places like Germany, Australia and California. Making rural consumers focus on energy efficiency/restraint is also crucial, but it is not going to happen while there are no meters and electricity is provided free of charge.

Background Of The Study

Energy is the important component of human civilization. various forms of energy enriched the

human civilization and also undergone serious transition in its usage. Among the various forms Electricity found prominent position in fulfilling the energy requirement of the human. Consumption, production and distribution of electricity energy entails huge process in which enormous activities embedded. Despite the fact forms of energy have been experiencing significant and serious transitions but the importance of energy usage heightened into indispensable level correspondingly as well. Supplementary to that, the dynamic part played by energy in achieving sustainable growth is now well prominent and the significant form of discrepancy prevailing in the world in terms of production, consumption and across of energy is found as a major issues and concerns of mankind. Dissimilarities in household energy usage prevailing among urban and urban populations, between high and low revenue groups within a country and among countries. The important factor accentuate such kind of situation are intensity of urbanization, economic development and transformation in living standards of the people due to economic affluence and excessive consumption. The key elements of demand for electricity energy in the household sector encompassing with, prices of electricity, demand for the electricity, usage of home appliances, affordability to cater the electricity charges, availability of electricity services, accessibility of electrical and electronic goods which became necessity product from luxurious goods. The chosen literature on the domain largely pertaining to consumption, production and distribution of electricity energy. These studies largely confined to energy usage and transition that household income, price of electricity energy prices, availability of the service, comfort in transmitting electricity energy without any constraint. Further, it is also noteworthy that revenue and expenditure pattern are the important component of electricity energy usage. However, usage of electricity not only confined to demand supply alone but its repercussions on environment and production constraints provoked the need to utilize the electricity at the efficient way without nullifying the demand of the people. In this context, awareness of consumers on efficient usage of the electricity became paramount significance. The development process in India embedded enhance the affluence of urban HH and expand the scope of home appliances and other goods which entails the consumption of electricity more. Urban regions with their larger population concentrations and space boundaries in energy deficiency and collection necessitate and also make easier the distribution of higher-density electricity energy. It

is also indispensable to have critical introspection towards the transition of energy usage in urban areas and the components of the energy sources have fulfilled their energy requirement. Generally, Household size, age structure and level education of the head of the household have stimulus on the household energy choice, in the same line, the household sector consumes 50 per cent of the total gross energy consumption for cooking and lighting purposes. The percentage is much higher for urban India, which utilize non-commercial energy sources to the extent of 80 per cent. This urban energy system itself is a very multidimensional, inter-dependent variables and also refinement in the usage are also significant lacuna to understand the energy demand and sources of usage as well. In this context, efficient usage electricity energy is the integral component of energy utilization not only helpful to reduce the HH electricity charges but also preserve the environment. Energy utilization arrangements and the awareness of the efficient usage of electricity energy diverge extensively across various areas and groups of households. Given the high degree of divergence in living conditions and consumption stages across various groups of households and urban/urban areas in India. Under this juncture the present study would propelled to map out the electricity energy consumption pattern of HH and how they utilized electrical energy to optimize their requirement, determinants of electricity energy usage, affordability of the availability electrical energy, perceptions of the usage and significance on electricity energy, impact and awareness on efficient usage of electricity energy and renewable energy.

Statement Of The Problem

Electricity energy consumption pattern in urban India is the prominent component of energy policy, supply and transmission. The growing urban agglomeration propelled the energy demand and related activities heightening consistently across India. Despite the fact demand of the electricity has been enhancing but it is also essential to understand the electricity consumption beyond demand and supply alone as the electricity production and transmission embedded with repercussions of environmental degradation as well. There is a need to map out the tradeoff between electricity energy demand and the environmental situation. Thus, effective usage of the electricity became imperative component in electricity utilization. In addition, consumer's choice, preference, awareness and inclination have played vital role in efficient energy consumption. Rapid urbanization has enhanced the

electricity consumption at enormous level and also expanded the electricity infrastructure Plethora of the studies confining to energy usage in urban areas have dealt with the energy choices on the basis of electricity availability, fees and the requirement, transition in energy usage, expenditure pattern of electricity energy utilization, consumers satisfaction on electricity energy supply. But dearth of the studies has adequately interrogated the perceptions of the electricity energy consumption pattern of the consumers in urban areas and the significance of the transition occurred in energy usage, efficient usage of the electricity energy, optimum usage electricity for escalating demand by the changing life style in the urban areas, the and the view of the electricity consumers in urban areas about non-conventional energy usage in a comprehensive manner. Thus, the present study is a modest attempt to address the perception of the consumers on electricity usage, awareness on efficient usage of the electricity and renewable energy. Moreover, the study also evaluates the demonstration effect of urban areas on energy consumption pattern of urban household and the awareness on various nuances pertaining to electricity consumption and usage of the consumers in Chennai district.

Scope Of The Study

The result of the present study would facilitates the policy makers to conceive energy policy of urban areas incorporating the desires of the urban HH which would be replicated across all the urban areas in Tamil Nadu. Further, the perceptions of energy consumption and prospective for usage of non-conventional energy would be helpful to understand the proximity of the non-conventional energy source towards energy requirement of the urban HH. Further, the aftermath of the study can specify and designate the lacunae of the contemporary intervention approaches in delivering energy services at the reasonable and cost effective manner and ensure the stakeholders to access the required energy for various purposes in more convenient manner.

Objectives of the study

- ❖ To examine the electricity consumption pattern of the selected households across the study area
- ❖ To identify the intensity of the usage of home appliances among the selected households across the study area
- ❖ To map out the perceptions of the selected consumers on efficient usage of electricity in the study area

Hypotheses

- ❖ Ho: There is no distinction between consumers engaging in formal employment and informal employment on awareness towards energy consumption across the study area.
- ❖ Ho: Utilization of home appliances and financial have not influence the degree of satisfaction of utilization of electrical energy of the selected respondents in the study area.

Methodology

Sources of data

The required data for the study collected from both secondary and primary sources.

Sources Of The Data

The relevant secondary data have collated from relevant literature confined to the chosen domain, books related to electricity and energy consumption, articles and other academic publications confined to the electricity energy. Journal articles. The adequate information channels that have been utilized for the literature study have been the MIDS Library, open public libraries, Google Scholar, other research online databases and American Embassy Resource Centre, etc. The required primary data collected from extensive survey conducted in selected areas of Chennai district.

Sample Size – Respondents

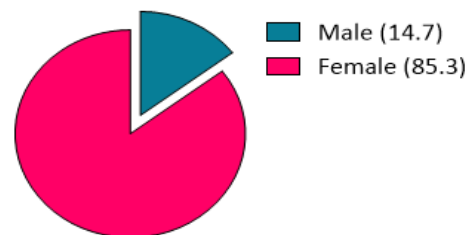
The sample size is an important feature of any empirical study in which the goal is to make inferences about a population from a sample. This section discusses the selection of a suitable sampling procedure and the sample composition in respect of the population considered for the study. Population is defined as the complete set of units of analysis that are under investigation, while element is the unit from which the necessary data is collected. Stratified random sampling utilized to identify the samples for the study. In order to determine the sample size for this study, In the first phase, Chennai district divided into three segments like North, Central and South Chennai. 200 samples selected from the each zones consists of eight areas and 75 samples collected from each areas and altogether 600 samples had collected from Chennai areas. The eight areas are from Chennai districts are Thondiarpet, Madhavaram, Perambur, Anna Nagar, Teynampet, Triplicane, Mylapore, Adayar.

Analysis of data

Statistical tools like percentage analysis, Chi Square test, ANOVA, Principal component analysis and Multiple Regression have applied to analysis the collected data.

Gender Wise Classification Of Chosen Electricity Consumers For The Study Purpose

Response category	Nos	Percent
Male	88	14.7
Female	512	85.3
Total	600	100

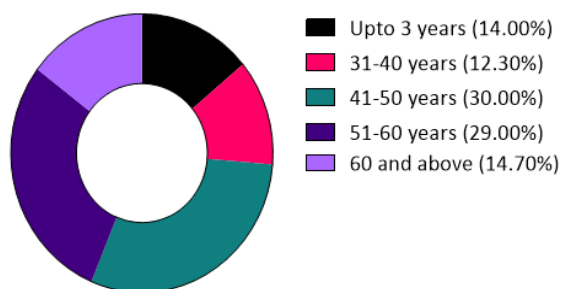


Gender wise classification of chosen electricity consumers

The above Table shows that 14.7% of consumers are male and 85.3% of consumers are females clearly showing that the women constitute the majority.

Age Wise Classification Of The Chosen Electricity Consumers For The Study Purpose

Response Category	Nos	Percent
Upto 30 years	84	14
31-40	74	12.3
41-50	180	30
51-60	174	29
60 and above	88	14.7
Total	600	100



Agewise Classification of the chosen electricity consumers

The above Table indicate that 14 % of the chosen electricity consumers are below 30 years 12.3 % of the chosen electricity consumers are from the age group between 31-40, around 30 % of the chosen electricity consumers from the group 41-50, 29 % represents from the age group 51-60 and 14.7 % of the chosen electricity consumers are above 60 years.

Limitations Of The Study

The study confined to urban parts of areas so it couldn't capture the nuances of interior villages located adjoining to Chennai.

Electricity usage have recorded according to the information given never tried any experimental methods to appraise the same.

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