

HOUSEHOLD ENERGY CONSUMPTION IN RURAL INDIA

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Abstract—This paper examines the rural energy consumption and problems in India. A number of factors change the pattern of energy consumption in rural areas. Moreover, shortage of non-commercial, cost of non-renewable energy, lack of time and life style have brought rapid change in rural energy consumption in recent years. Moreover, growth of population and increase in the demand for energy consumption has reduced about 16.7 per cent of the total forests. Rural people depend on energy such as fire wood, agricultural residues, dung, kerosene, gas and electricity in India. However, the primary energies used for cooking are fire wood and LPG and kerosene and electricity for lighting. It is seen that type of energy used for cooking and lighting differs from family to family, area to area and even time to time. For instance, the poor use fire wood agricultural residues and cow dung where as middle income groups use both fire wood and LPG and the rich depend on LPG and electricity in rural areas. Hence, an attempt is made in the study to analyze household energy consumption pattern and problems in rural India at micro level.

Keywords— Commercial energy, renewable energy, energy consumption, agricultural residues, electricity, kerosene

Introduction:

Energy consumption plays most important role in cooking and lighting but its consumption varies from rural to urban areas. Rural people use fire wood, agricultural residues, dung, leaves, kerosene, gas and electricity where as urban people depend mostly on Kerosene and electricity. It is seen that there is a remarkable changes in the rural energy consumption in recent years. People used dry leaves, plants, fire wood and agricultural residues about three decades ago. But, most of the people use gas and electricity for preparing tea, meals and heating water in recent times.

Significance of the study:

Energy consumption is one of the basic necessities of human life, In fact, human life is unthinkable in absence of energy people use different sources of energy for cooking food and heating water. Lack of firewood cost of gas, and Kerosene lack time for cooking and socio-economic background have changed the energy consumption pattern in rural India. Moreover, rural people face a lot of problems in using different sources of energy several studies carried out by Rai, S. N of Chakraborti (1996), R. K Aggarwal (2001) Rangahatha V, Subha Reo, S and Prabhu G. S (1993) and Singh D. V and Sikka, B. K (1994) proved that there is a change in energy consumption pattern in rural Karnataka Himachel Pradesh and Maharashtra. These studies are partial in the sense that they failed to analyse the cause and problem of involved in rural energy consumption in rural areas. Such failure has drawn the attention of scholars and researchers This study is significant one because it is the first attempt an analysis the cause of changing energy consumption and problems of energy in rural area.

Objectives of study:

The present study is carried out with the following objectives,

1. To analyse the changing scenario of rural energy consumption
2. To identify the causes of changing energy consumption in rural areas.
3. To find out the problems of rural energy.

Methodology:

The present study was conducted in the rural areas of Kanyakumari District of Tamil Nadu. This is the only district which has 81 per cent rural areas. It consists of four taluks namely Agasteeswaram, Thovalai, Kalkulam and Vilavancode. So, the respondents have randomly been selected from these taluks. The study gave equal importance to the four taluks irrespective of size of population, size of area and environment. Thus, fifty samples have been selected from each taluk. Accordingly, the total number of respondents is 200. The simple random sampling methods was used for data collection. The collected data were processed and analyzed with appropriate statistical tools.

House hold rural energy consumption:

The house hold sector is one of major consumption of energy. The national budget accounts it for about 50 per cent of energy consumption in India. It is seen that about 75 per cent of total population lives in rural areas. Rural people need energy for cooking, lighting and water heating and supply since the present study is concerned with rural house holds, it analysis the energy consumption for cooking and water heating in rural areas of Kanyakumari District. The demand for energy is met by both the commercial and non-commercial energy. Commercial energy includes LPG, kerosene, electricity

and firewood. On the other hand, non- commercial energy refers to dry leaves, sticks and plants, agricultural residues and dung mainly obtained freely from own or neighbours’s farms.

Changing energy consumption:

People live in rural areas have been changing energy consumption for cooking and water heating for the last three decades in Kanyakumari District. It can be shown in Table 1

Table 1
Changing energy consumption

S. No	Type of energy	1980	1990	2000	2010	2015
1	Fire wood	142 (71)	128 (64)	96 (48)	74 (37)	66 (33)
2	Agricultural residue	26 (13)	26 (13)	18 (9)	12 (6)	10 (5)
3	Dung	18 (9)	14 (7)	10 (5)	6 (3)	4 (2)
4	Kerosene	14 (7)	30 (15)	20 (10)	16 (8)	16 (8)
5	Gas	- (0)	2(1)	52 (26)	80 (40)	90 (45)
6	Electricity	- (0)	- (0)	4 (2)	12 (6)	14 (7)
	Total	200 (100)	- 200 (100)	200 (100)	200 (100)	200 (100)

Source: Field survey

Table 1 displays the changing energy consumption in rural areas for the last 35 years. It is seen that the number of fire wood users decreased from 71 per cent in 1980 to 33 per cent in 2015. The number of agricultural residues users decreased from 13 per cent in 1980 to 5 per cent in 2015. The number of respondents who use dung as energy decreases from 9 per cent in 1980 to 2 per cent in 2015. The number of kerosene users decreased from 15 per cent in 1990 to 8 per cent in 2015. It is important to note the number of respondents who use LPG increased from 1 per cent in 1990 to 45 per cent in 2015. The number of respondents who utilize electricity increased from 2 per cent in 2000 to 7 per cent in 2015 The study observes that people shift from non- commercial energy to commercial one and they use almost all types of energy in rural areas. The study also found that number of respondents who use gas (45%) is more than fire wood (33%) users in the study area. It shows the changing energy consumption pattern in rural areas in recent years.

Reasons for changing energy consumption:

The reasons for changing energy consumption differ from place to place time to time and even family to family. This is because the availability of energy sources, time for cooking ,cost of energy and socio- economic back ground play a significant role in the use of energy in rural area. The causes of change in energy consumption are presented in Table 2.

Table: 2
Cause of changing energy consumption

S. No	Cause	No of Respondent	Per cent
1	Lack of fire wood	42	21
2	Lack of Agricultural residues	10	5
3	Lack of Dung	6	3
4	Lack of Time	32	16
5	Availability of commercial Energy	40	20
6	Changing life style	46	23
7	Cropping pattern	24	12
	Total	200	100

Source: Field Survey

Table 2 exhibits the causes of changing energy consumption in the study area. The study shows that among the total respondents (200), 23 per cent change the energy consumption due to the their socio- economic back ground and style. In fact, education, income and nature of occupation have modified their standard of life and these have a great impact on energy consumption. Among the total respondents, 21 per cent respondents expressed that they change energy consumption owing to lack of fire wood, and its cost. Out of the total respondents, 5 per cent and 3 per cent considers lack of agricultural residues and dung as the causes of change in energy consumption in rural areas.

The study identifies that about 16 per cent respondents change the energy due to lack of time. They are employees working of distant places and use gas or electricity for cooking and water heating in order to save the time. It is seen that 20 per cent respondents state that availability of commercial energies such as LPG and electricity bring about change in energy use pattern in the study area. More over, 12 per cent respondents change energy due to change in cropping pattern and land used for non- agricultural purposes. They convey that these change affect, the availability of agricultural residues and fire wood. As a result they depend on LPG and electricity for household uses. Thus, the study found that change in life style, cropping pattern, lack of time for cooking, lack of fire wood, dung and agricultural residues change energy consumption in rural areas.

Problems of Energy consumption:

People face various problems in energy consumption in rural areas. Lack of energy, cost of energy, changing environment, delay in the supply of LPG, lack of energy subsidy, lack of knowledge about modern energy and accident are some problems identified in the study. This can be seen in Table 3.

Table: 3

Problems in energy consumption

S. No	Problem	No of Respondents	Per cent
1	Lack of energy	32	16.0
2	Cost of fuel	41	20.5
3	Changing Environment	30	15.0
4	Delay in supply	53	26.5
5	Lack of subsidy	24	12.0
6	Lack of knowledge	13	6.5
7	Accident	7	3.5
	Total	200	100.00

Source: Field Survey

Table 3 reveals the problem of respondent in energy consumption in rural areas. The study depicts that out of the total respondent 16 per cent suffer from lack of energy like fire wood and agricultural residue. About 20.5 per cent respondents suffer from increase in the cost of fuel like fire wood, LPG and electricity.

It is seen that changing environment such as cropping pattern, land used for agricultural purpose, extension of urbanisation and changing life style reduce the availability of non-commercial energy and increases price of commercial energy. In fact, it causes many problems in rural energy consumption in the study area. Moreover, delay in the supply of LPG and frequent power cut create the problems in energy use pattern. The study found that 26.5 per cent respondents suffer from this problem. Rural people expect subsidy for using energy like LPG and electricity. The non-availability of energy subsidy affects 12 per cent respondents. The study observed that 6.5 per cent respondents do not know how to use LPG gas and they fear about it. Moreover, 3.5 per cent respondents state that use of energy like LPG and electricity causes accidents.

Suggestions:

1. Energy subsidy may provided for domestic use at least based on income of the uses.
2. Awareness should be developed among the rural mass about how to use LPG and electricity and shun accident and fear.
3. People may use fire wood, gas, kerosene or electricity to reduce the shortage of particular energy
4. Jobless women may use dry leaves ,plants and fire wood in order to avoid or use of LPG and electricity.
5. Gas and electric stove and burners should be handled carefully and switch off when not in use. Moreover, children should be advised to avoid mishaps.

Conclusion:

The paramount objective of this study to find out the changes in energy consumption, its causes and problems in rural India. It cannot be denied that consumption pattern of energy depends on socio-economic background of the respondents. However, the rural people prefer gas and electricity to agricultural residues, fire wood and dung in order to save time and avoid smoke. The study observes that the number of respondents using gas increased from 2 to 45 per cent in 2015. On the other hand, the number of respondents using fire wood decreases from 71 per cent in 1980 to 33 per cent in 2015. The study observes that convenience of people influence more than availability in the determination of energy consumption in rural areas. Hence, the suggestion given in the study may be implemented to effective use of energy and lead healthy life.

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