

Energy consumption pattern in rural households of Tura, Meghalaya

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■ **ABSTRACT** : Energy has been recognized as basic requirement in every aspect of human welfare. Energy is a fundamental requirement for subsistence in the form of cooking, heating and lighting and at the same time it is a necessary input in productive processes such as agriculture, transportation and industry. In India, the household sector is one of the major energy consuming units accounting for half of the country's energy demand which is nearly double quantity of energy consumed by agriculture and industry. A sample of hundred households was selected for the study from the rural areas of Tura, Meghalaya. The objective of the study was to estimate per capita energy consumption per household. The study on energy consumption pattern in rural households of Tura revealed that non-commercial sources were used in greater amount as compared to commercial sources. The per capita consumption of firewood was 1.48 as compared to L.P.G. which was only 0.08.

■ **KEY WORDS** : Commercial fuel, Non-commercial fuel, Per capita consumption

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Energy is a critical commodity and acts as essential ingredients in life. There is positive association between per capita income and per capita consumption of energy. As economy develops, the demand for energy tends to increase and its consumption pattern in terms of energy forms, sources and amounts also tend to change. The energy sources and amounts also tend to change. The energy sources used by people are often classified into commercial (modern) and non-commercial (traditional) fuel items. There are marked differences in energy consumption pattern in rural and urban areas. In rural areas, major part of energy consumed in domestic sector is used for cooking, lighting, water heating and space heating. It was found that the per capita energy consumption in rural areas was as low as 10-12 per cent of that in urban areas as major proportion of the rural population was too poor to afford them. As the women folk in rural domestic sector are invariably involved in energy consumption. They have greater role as users and consumers of energy to play at several levels. Hence, an attempt was made to study per capita energy consumption per household.

RESEARCH METHODS

The study was conducted in the rural areas of Tura, Meghalaya. A two stage stratified purposive cum random sampling method was adopted in order to select the samples. Two blocks were selected for the study and fifty respondents from each block were the sample of the study.

RESEARCH FINDINGS AND DISCUSSION

General information of the respondents as shown in Table 1 revealed that majority (91%) belonged to scheduled tribe; high percentage (77%) of the respondents lived in a nuclear family. Mostly (53%) the sizes of the families were medium with 5-7 members. As regard to occupation, 36 per cent were engaged in service, 30 per cent were farmers, followed by petty business and other occupations. Around thirty per cent of the respondents had monthly income between Rs. 2001-Rs. 4000/ and only 9 per cent of them had income of Rs. 8001 and above which showed a poor economic condition in the rural areas.

While studying the type of fuel used by the respondents, (Table 2) it was found that most of the

Table 1: General information of the respondents		
Sr.No.	Characteristics	Frequency/ percentage
1.	Caste of the respondents	
	General	07
	O.B.C.	01
	S.T.	91
	S.C.	01
2.	Type of family	
	Nuclear	77
	Joint	12
	Extended	11
3.	Land holding size	
	Landless	09
	Small	37
	Medium	41
	Large	13
4.	Occupation of the head of the family	
	Farming	30
	Labour	10
	Service	36
	Petty business	12
	Any other	12
5.	Size of the family	
	Small (2-4 members)	14
	Medium (5-7 members)	53
	Large (more than 7 members)	33
6.	Monthly income of the family	
	Less than Rs. 2000/-	11
	Rs. 2001-4000/-	30
	Rs. 4001-6000/-	26
	Rs. 6001-8000/-	24
	Rs. 8001 and above	09

respondents (70%) used firewood as fuel for their cooking purpose. Rural women collect firewood from forests and then they piece it and keep in the sun for drying. After that they stack the wood in a shed place and use it as and when required. Branches, mainly twig and limbs of trees were used by 84 per cent of the respondents. Firewood is most traditionally used fuel in India. Kerosene was used by 39 per cent of the respondents as fuel for lighting purpose. Petroleum fuel like LPG did not gain much popularity among the rural people and as a result of which although 36 per cent possessed LPG they used it occasionally, which may be due to high cost of LPG or easy availability of fuelwood in the households. Nearly 61 per cent of the respondents used electricity as fuel for lighting purpose. It is in accordance to the fact that use of electricity in rural areas remains low in most countries.

Table 2: Types of fuel used			
Sr.No.	Types of fuel	Frequency/ percentage	Percentage
1.	Firewood	70	70
2.	Branches	84	84
3.	Root	-	-
4.	Crop residues	-	-
5.	Kerosene oil	73	73
6.	LPG	36	36
7..	Biogas	-	-
8.	Electricity	61	61
9.	Coal	11	11

Fuel consumption pattern was determined in terms of total fuel consumption per day, average fuel consumption per day and per capita fuel consumption in rural areas of West Garo Hills, Tura .

A probe regarding amount of various energy sources for cooking was made in Table 3. It is evident from Table 3 that firewood which is the major source of cooking fuel in the rural areas was used on average 11.75 kg/day/household.

These results are in conformity with the findings of

Table 3: Per capita fuel consumption per household for cooking in rural areas of Tura					
Type of fuel	No of households	Population	Total fuel consumption per day	Average fuel onsumption/ day /household	Per capita fuel consumption
Firewood	71	568	844.21	11.75	1.48
Branches	84	796	289.74	3.44	0.36
Crop residue	-	-	-	-	-
Agro waste	-	-	-	-	-
Root	04	32	9.73	2.43	0.30
Biogas	-	-	-	-	-
LPG	36	385	33.6	0.93	0.08

Nagbrahman and Sambrani (1993) who found that in the villages of Gujarat, the rural women required an average of 10 kg/day of firewood or cooking.

Another common source of cooking energy, the branches were consumed 3.44 kg/day/household, followed by root 2.43 kg/day/household. Thus, the per capita consumption of firewood was 1.48 kg followed by branches 0.36 kg and followed by root 0.30 kg. It is supported by the study of Mishra (1991) who viewed that the non-commercial sources especially firewood will keep playing predominant role in rural energy consumption. But the use of crop and animal waste as fuel depletes soil quality and agricultural productivity since these resources have alternative applications as organic fertilizers.

Average consumption of LPG for cooking was found to be quite less, it accounted for about 0.93 kg per day per household. It is in accordance with the study by Baruah (1995) who found that only 1 per cent of the respondents used LPG as fuel for cooking purposes.

From the present investigation (Table 4) it was found that for grain processing the rural women mostly used branches as fuel. Per capita consumption of branches for grain processing was found to be 0.26 kg. However, per capita consumption of firewood and coal was found to be 0.18 and 0.17, respectively as shown in Table 4. Interestingly women never used crop residues and agro waste for the purpose of processing of grains.

Kerosene and electricity were used by the respondents for lighting purposes. The average consumption of kerosene was found to be .02 litres per day per household. Although there is growing demand for electricity among domestic sector in recent years, still electrical energy consumption in India is far below the level in developed countries. From the study it was seen that per capita electricity consumption in the study area was 1.23 units as seen in Table 5.

The overall picture indicates that non-commercial sources were available and used by an overwhelming majority

of respondents as compared to commercial sources. This is attributed to the fact that non-commercial energy sources are locally available to them, while commercial sources are not only introduced from outside, but they also involve cost, time and transport which work as distinctive for rural people. Furthermore, the energy sources which have been in use for centuries continue to remain in vogue as a matter of first preference without realizing the need for newer sources of energy especially for household operations.

Conclusion:

Energy is vital to our existence on earth. The ability to generate and master the use of energy from his own hands has been the key to man's survival and development. Energy is any society's fundamental need. On the basis of the findings it can be concluded that energy use pattern for cooking in the rural areas is dominated by non-commercial energy sources. Mostly firewood was used as major fuel in their traditional *Chulha* for domestic use. Fuel wood, crop residue, branches still continue to be the major source of energy of the rural population and are burnt in stone and mud made stoves called *Chulhas*. Among these, three fuel resources, wood is predominant fuel resources which is largely used for cooking and heating purposes. A characteristic feature of the fuelwood is that, it is collected from forests, village plantations and is done by women and children. The chulhas that are used are inefficient emitting a lot of smoke causing respiratory and eye diseases. Therefore, it can be noted that use of fuel wood not only leads to environmental degradation but it is also hazardous to the health. It also reveals that commercialization of household fuels whether wood fuels or modern fuels is a sign of fuel scarcity. The country's planners have mainly focused on modern fuels while they have totally neglected traditional fuels in the hope that modern fuels will replace traditional fuels some day. The result is an energy crisis on all fronts.

Table 4 : Per capita fuel consumption per household for grain processing in rural areas of Tura

Type of fuel	No. of household	Population	Total fuel consumption/day	Average fuel consumption/day/household	Per capita fuel consumption
Firewood	34	373	67.7	1.99	0.18
Branches	36	338	88.18	2.44	0.26
Crop residues	-	-	-	-	-
Agro-waste	-	-	-	-	-
Coal	11	124	21.5	1.95	0.17

Table 5: Per capita fuel consumption per household for lighting in the rural areas of Tura

Type of fuel	No. of household	Population	Total fuel consumption/day (litres/units)	Average fuel consumption /day/ household (litres / units)	Per capita fuel consumption(ml/units)
Kerosene	39	349	0.86	0.02	0.002
Electricity	61	701	866.75	14.20	1.23

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