

Analysis of Energy Usage Pattern in Rural Area and Factor Affecting Consumption

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ABSTRACT

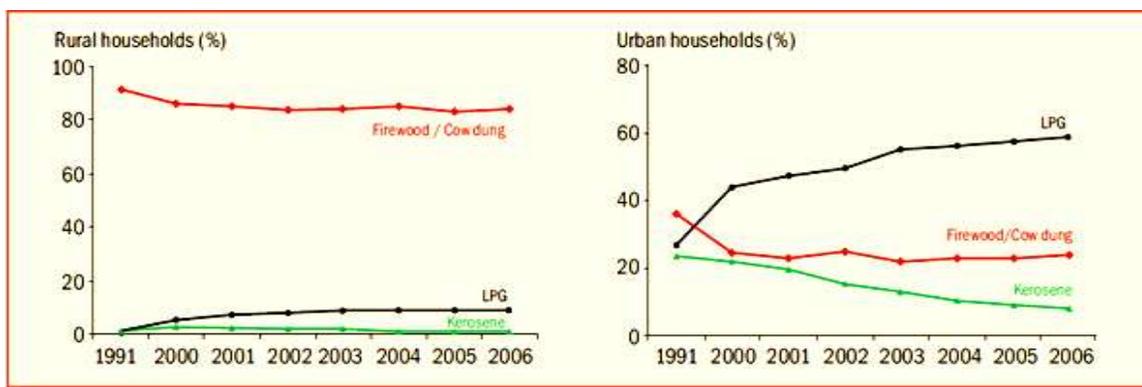
To assess The Energy consumption Pattern in India and subsequently, the Rural Part of Maharashtra i.e Marathwada is selected as Marathwada is the most backward region in Maharashtra having Lowest Power accesses, Economy and Lowest Per capita Income Group Peoples. The Marathwada is known for Farmer suicide @2000 suicides every year. This Paper tries to bring conclusion that the Energy consumption is the indicator for GDP and if we focus at the rural regime for higher energy utilization and its access along with availability ,the GDP of rural and hence for India can be uplifted

Keywords: Energy Conservation, Energy Scenario, Energy Parameters in India, Energy in Maharashtra etc.

1.INTRODUCTION

1.1 Primary Fuel Use Patterns for Cooking And Lighting

India also displays a striking rural-urban dichotomy in its choice of cooking fuels. An overwhelming majority—about 80% of rural homes in India—continue to use biomass—firewood, crop residue or cow dung—as their primary cooking fuel as per TERI in 2006 Report. This situation is likely to improve further.



Presents Data from Block 3 of the NSS overview in which family units report which fuel they fundamentally use for cooking, and which fuel they principally use for lighting. Essential cooking powers comprise of 10 alternatives (coke or coal, kindling, LPG, gobar gas, manure cake, charcoal, lamp oil, power, others, and no cooking course of action). Essential lighting source comprise of 7 alternatives (lamp fuel, other oil, gas, flame, power, others, and no lighting course of action). Both the essential cooking and lighting fuel classes were consolidated to demonstrate just the most well-known fuel sorts. Whatever remains of the fuel sorts were incorporated into the "Other" class. For the Primary Cooking and Primary Lighting fuel outlines separately, the aggregate of sub-straight out fuel sorts squares with 100%.

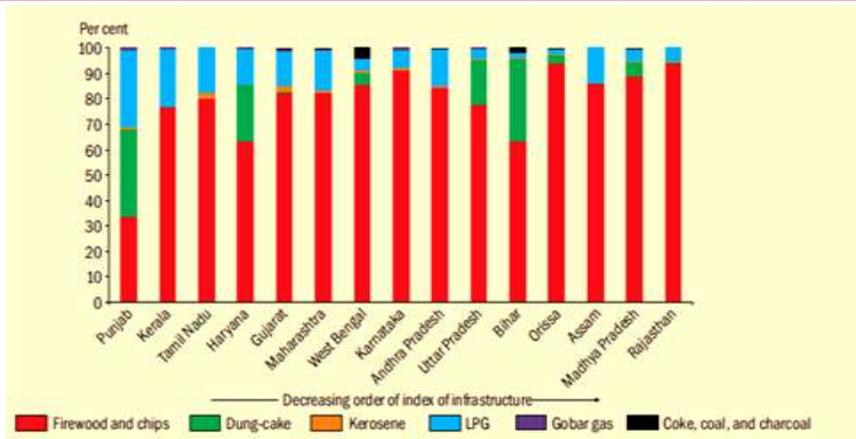


Figure 1. Index of Infrastructure

Source: Teri, NSSO 63rd round (2006–07)

Total information on financial action, fuel utilize examples and mass fuel utilization are normally used to give a valuable national-level depiction of family energy utilize and utilization progression. While these total information might be clever when utilized with the end goal of nation or provincial examination, they veil the significant variety crosswise over states, regions (urban country), and salary portions.

Disaggregated information can yield generous understanding to enhance item configuration, benefit conveyance, showcasing and correspondence, and in addition strategy outline and execution. For instance, 65% of families crosswise over India report utilizing power as their essential lighting source. In any case, when disaggregated into urban and country populaces, the information uncover that 92% of urban and 55% of rural families utilize power as their essential lighting source. Also, a nearby examination of the state level NSS information for Bihar and Punjab highlights the extraordinary between state changeability. The Energy Atlas uncovers that while 96% of country family units in Punjab report utilizing power as their essential lighting source, just 10% of rustic families in Bihar report doing as such. Disaggregated information uncovers a substantial potential market open door for giving option lighting and energy answers for the almost 12.7 million family units in country Bihar that would somehow or another be veiled by the ordinarily referred to all-India figures. Maharashtra Account it 87 % Family utilizes power as their essential Lighting source

More noteworthy utilization of more energy productive innovations in India would in many yet not all cases pay for themselves as energy funds. This prompts the accompanying inquiries:

- (1) What impacts a few firms and families to receive more energy effective advancements? what's more,
- (2) Is this rate of reception proficient? With answers to these inquiries, one could help plan strategies to enhance the monetary effectiveness of energy utilize and investigate open doors for worldwide collaboration and co-financing to additionally enhance energy productivity as a measure for decreasing worldwide CO2 discharges.

2.ANALYSIS

Be that as it may, the sectoral energy force has a positive association with the energy power of the Indian assembling. As the adjustments in the sectoral energy force are unidirectional to the adjustments in the total energy power of the businesses, they are driving the adjustments in the total energy force of the Indian assembling. The examination as performed along these lines uncovers a few fascinating elements of energy use in India. Power utilization is relied upon to expand quick, determined by the request of the private and business areas that add to the effectively expanding request from the business part. Per family unit private power utilization will probably fourfold in the 20 years in the vicinity of 2000 and 2020. Actually, essential power utilize will build more quickly than some other significant fuel – much more than oil, regardless of the way that vehicle is the most quickly developing division. The development in power request suggests that endless blackouts are not out of the ordinary unless radical changes are made both to the effectiveness of the power foundation and to electric end utilizes and mechanical procedures. In the vehicle segment, the quick development in individual vehicle deals demonstrates solid energy development here. In any case, our investigation shows that in all out energy terms, oil item utilization will stay equivalent in the private part (as lamp oil), and in overwhelming industry. What's more, oil utilization utilized for cargo transport will keep on outpacing traveler transport. Despite the fact that the business area has encountered colossal upgrades in energy power per ton of material delivered, energy use from this part is required to keep on

growing quick. The primary reason is a solid movement projection in this industry part determined by the interest for framework advancement.

The plan of this report was to use as wide a variety of accessible information at the most abnormal amount of detail conceivable. Without a doubt, some officially accessible sources were ignored. When all is said in done, in any case, the creators feel that the best crevices in information accessibility emerge from an absence of precise insights, all the more particularly for the vehicle area. Along these lines, we would like to highlight ranges where the best picks up could be made through more careful uncovering of information sources or, if vital, finishing the overviews and measurable examination important to produce new information sources. For instance, the division with the minimum information is the administration area, where information on floor space should be gathered and reviews on energy utilize should be directed. We likewise found that the vehicle part needs predictable information announcing from a national source, particularly on the supply of vehicles being used and efficiency of vehicles. At long last, just a couple of information focuses were found to portray the unit energy utilization by machine sort and little is known on their average life time and hour of utilization. Future information gathering on these issues will permit refining the principal energy utilize breakdown grid created in this report for India.

At last, the estimation of an examination, for example, exhibited in this report will be measured by its utilization in ensuing exploration into energy request in India. Specifically, the scientific system displayed in detail here is composed with an eye toward improvement of itemized, reasonable and vigorous energy effectiveness situations for India. Such situations can be made by applying best practice innovation choices at the level of endues, hardware or process, in this manner guaranteeing that worldwide enhancements are supported by achievable base up arrangement and market intercessions. The development of such situations would go past an assessment of reserve funds possibilities, giving the expository components to an exhaustive energy system, or guide.

Country India has customarily been dependent on biomass based fills, for example, kindling and dairy animals excrement, while urban India is riding the development of LPG and PNG. Albeit country and urban India demonstrate a division in their present utilization of cooking fills, they are not joined in their turn towards cleaner cooking energizes. What obstructs a clearing movement towards cleaner energizes are components of moderateness, accessibility, mindfulness

3. Aggregate Fuel Use

Information for the month to month sums were taken only from the 'utilization of fuel and light amid the most recent 30 days' area of the NSS overview. As showed in the title, this area records the amounts, use values, and wellsprings of different fuel sorts utilized by families in the 30 days before the meeting. Twelve fuel classes are recorded in this segment of the NSS review, including: candles, charcoal, coal, coke, fertilizer cake, power, kindling, gobar gas, lamp oil, LPG, matches, and different fills. In this segment, lamp fuel speaks to the mix of both Public Distribution System (PDS) lamp oil and lamp oil acquired through different sources. While isolate in the NSS study, they are consolidated for the reasons for the Energy Atlas.

Family unit Fuel Use demonstrates the rate of families utilizing each of the significant fuel sorts (compost cake, power, kindling, lamp oil and LPG). This is ascertained by partitioning the aggregate number of family units utilizing every fuel sort by the aggregate number of families around there, either all-state, provincial or urban. This demonstrates the extent of the populace that uses every fuel sort.

Add up to Monthly Expenditure on Fuel and Light is the entirety of aggregate market values for every fuel classification, speaking to the estimation of all fuel utilized as a part of that district every month. Normal Monthly Per Household Expenditure (MPHE) on Fuel and Light is the aggregate market estimation of all fuel utilized as a part of the previous 30 days separated by the aggregate number of family units. This suggests normal fuel use acquired by family units every month

4 Factors affecting the Fuel consumption

i) Imbalances in Price of Electricity: The survey indicated that price of electricity is higher for the poor people who were living in the rural areas of Maharashtra. These rural residents are unable to register their name in Electrical Department, the reason being that for registrations they need pay Rs. 2000, which is not affordable for them. The Tariffs are demotivating forces to them

ii) Income: Income is also another factor which determines the consumption level of electricity in rural and urban areas of Maharashtra. In rural area, the people are primarily daily wage earners who do not have regular income. They are mostly self-employed in an unorganized sector. The 61th NSS survey of Maharashtra indicates that higher proportion of rural population (32.9 per cent) of Aurangabad division belongs to the lowest group of MPCE I.E

Monthly Per capita Expenditure, (MPCE less than Rs. 365) as compared to all other divisions of the State. Indicating Least earning capacity and hence the Energy cost remains relatively unaffordable.

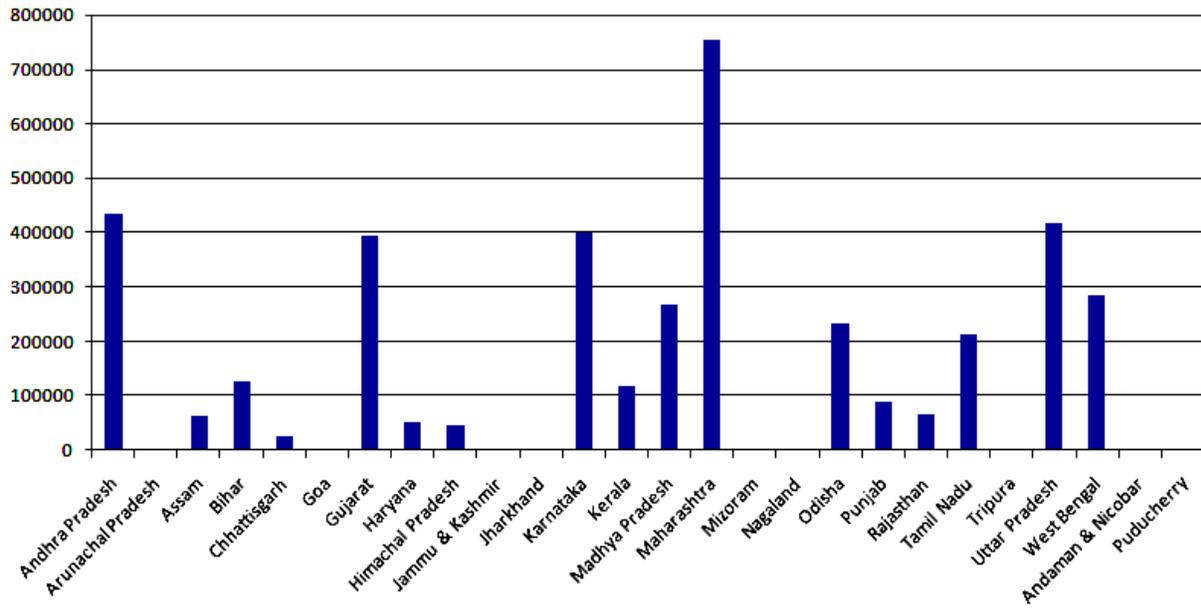
5 Statewide Energy Optimization of various Renewable Energies

The Govt has promoted the various options and schemes to promotes intensive use of Biogas, Waste to energy means the following tabulation expresses the situation better situation in Maharashtra but a lot of potential is still ahead. This could bring a positive factor in Energy access.

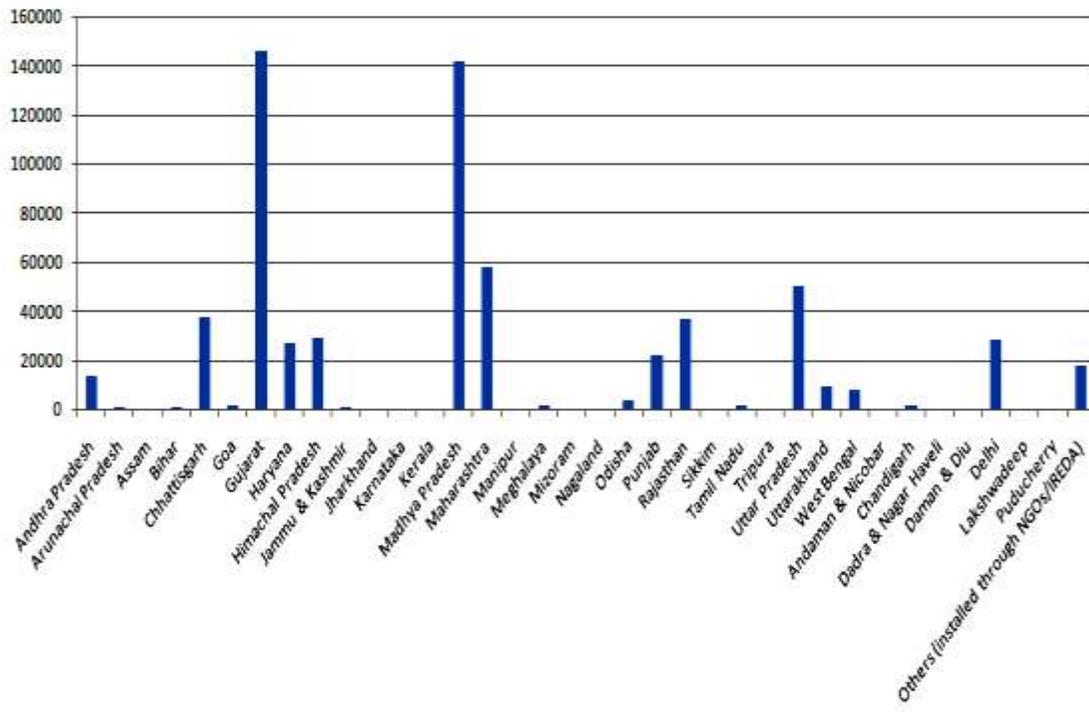
States / UTs	Biogas plants (number)	Biomass gasifier	Waste to energy (industrial) (MW)	Waste to energy (biogas) (MW)	Water pumping wind mills (number)
Andhra Pradesh	433414	15.38	3.75	0.95	6
Arunachal Pradesh	2545	1.98	.N.	.N.	.N.
Assam	63642	0.12	.N.	.N.	3
Bihar	125488	0.49	.N.	.N.	46
Chhattisgarh	25499	0.51	.N.	.N.	.N.
Goa	3828	0.02	2	0.91	.N.
Gujarat	395552	14.51	.N.	.N.	874
Haryana	51314	1.06	.N.	.N.	.N.
Himachal Pradesh	45225	0.01	.N.	.N.	.N.
Jammu & Kashmir	2262	0.52	.N.	.N.	.N.
Jharkhand	3079	0.18	.N.	.N.	.N.
Karnataka	400614	5.56	.N.	2	26
Kerala	117227	0.73	.N.	.N.	79
Madhya Pradesh	266389	4.74	.N.	0.03	.N.
Maharashtra	753831	3.82	.N.	1.76	26
Manipur	2128	.N.	.N.	.N.	.N.
Meghalaya	5111	.N.	.N.	.N.	.N.
Mizoram	3670	0.2	.N.	.N.	.N.
Nagaland	3123	1.38	.N.	.N.	.N.
Odisha	232190	0.07	.N.	.N.	.N.
Punjab	88344	0.7	.N.	1.58	.N.
Rajasthan	67080	0.23	.N.	.N.	222
Sikkim	6331	.N.	.N.	.N.	.N.
Tamil Nadu	213015	5.41	0.23	2.75	56
Tripura	2587	1.1	.N.	.N.	.N.
Uttar Pradesh	416998	4.89	5	0.73	.N.
Uttarakhand	8179	.N.	.N.	1.52	.N.
West Bengal	285462	7.35	.N.	.N.	.N.
Andaman & Nicobar	137	0.17	.N.	.N.	2
Chandigarh	97	.N.	.N.	.N.	.N.
Dadra & Nagar Haveli	169	.N.	.N.	.N.	.N.
Daman & Diu	.N.	.N.	.N.	.N.	.N.
Delhi	.N.	0.07	.N.	.N.	.N.
Lakshwadeep	678	.N.	.N.	.N.	.N.
Puducherry	573	0.6	.N.	.N.	.N.
Others (installed through NGOs/IREDA)	.N.	0.32	.N.	.N.	.N.

SOURCE ;MNRE,GOI

Biogas plants (number)



Solar cooker



States / UTs	Aerogen/hybrid systems (kW)	SPV Street lighting system (number)	SPV Home lighting system (number)	SPV Solar lantern (number)
Andhra Pradesh	16	3733	1628	35152
Arunachal Pradesh	.N.	788	1770	9937
Assam	6	98	5870	711
Bihar	.N.	690	2771	50117
Chhattisgarh	.N.	1409	7028	3192
Goa	63.8	283	223	603
Gujarat	10	2004	5918	31603
Haryana	.N.	3793	22698	41465
Himachal Pradesh	.N.	2994	16840	22470
Jammu & Kashmir	.N.	5496	15769	27509
Jharkhand	.N.	620	4035	16374
Karnataka	34.15	2271	23038	7334
Kerala	8	1090	32326	41181
Madhya Pradesh	.N.	6054	1307	8564
Maharashtra	489.37	3491	825	8683
Manipur	30	370	2850	3883
Meghalaya	.N.	1273	7040	24875
Mizoram	.N.	315	3045	5812
Nagaland	.N.	271	218	3437
Odisha	.N.	5819	4485	3882
Punjab	.N.	3037	4620	14995
Rajasthan	4	6632	50551	4716
Sikkim	10	162	1805	720
Tamil Nadu	24.5	2672	1557	16181
Tripura	.N.	760	2800	28000
Uttar Pradesh	.N.	950	52997	51683
Uttarakhand	.N.	1169	43331	56523
West Bengal	18	2111	76304	3662

From the above survey it is clear that the Maharashtra state has lagging in providing in basic Lighting and proper cooking aids

6 Rural area Energy Consumption Pattern and Analytics Report

Country	Per capita consumption	
	Electricity	Energy
	(kWh)	(toe)
USA	13,361	7.15
Germany	7,217	4.00
Brazil	2,384	1.36
China	2,942	1.81
India	818.8 *	0.59
India 2031-32 #	2470	1.5

Source :world Energy statics 2012

To analyze the consumption and prove the fact that the per capita consumptions very low in rural area data has been selectively gathered and analyzed in this session.

At the outer view where the progressed countries like US has a figures on @ 12000 kw energy consumption per capita per year .Most surprising fact is that the global average is as high as 3,500 kWh/year, where India and China are so low. Two things explain this, household size and electrification rates.

In China about 99% of people have electricity and average household size is around 3. In India these are 66% and 5 respectively and in Nigeria 50% and 5. Average household size in most wealthy countries is closer to 2.5 people. As a result the distribution of electrified households is more skewed towards wealthy countries than population in general. Even the consumption in rural yet is too low India average is 900 /year while in rural it is @ 60 -150 indicating a significant fact .Following analysis supports it

Few districts were selected to know the real consumption from state Govt.report based on MSEDCL(MAHARASHTRA STATE ELECTRICAL DISTRIBUTION COMPANY) .

It draws clear fact that per capita Energy consumption drops from Metro to urban, rural .

Even though Govt has attractive tariff plan for Rural area, the availability and the income are still a major criteria for the residents. The agriculture families has critical issues of voltage fluctuations, availability at critical time .Hence the average consumption seems a dip in rural areas .The situation has multiple angle right from unawareness in renewable to the various continued issues with power and energy supply to the rural areas

Few districts have been analyzed to verify the fact .

District: Osmanabad

Taluka	Domes tic	Commercial	Industrial	Agricult ure	Other	Total	Per Captia Consu mption Of Electric ity	Total Electricit y Connecti ons (Lakhs)
1	2	3	4	6	7	8	9	10
Parand	10758	902	1696	27080	2849	44125	0.35	0.31

a								
Bhum	8316	1059	1360	16616	1822	29767	0.25	0.2
Washi	7662	558	916	10271	2161	22630	0.24	0.2
Kalamb	15091	1597	2785	21393	1932	44626	0.24	0.47
Osmana bad	43042	7403	6754	60414	4284	125443	0.35	1.25
Tuljapu r	19704	3171	4415	31402	5090	68102	0.27	0.49
Lohara	10961	590	1273	18016	1595	33785	0.31	0.26
Umarga	20977	3157	3169	24660	4099	58156	0.24	0.39
Total	136511	18437	22368	209852	23832	426634	0.28	3.57

Table . Taluka Wise Analytics of Energy Consumption

6 Conclusion of the Survey /Data Collection

From the above analysis following we can summarize following points

1. The Per capita consumptions of Energy is low in Rural area and the same may be the reason of lower income and further suicides of Farmer.
2. Use of the Renewable means are quite low compared to the other states the reason possible is the inefficient government mechanism to make the public aware about it and also to know various schemes of Government .

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