

## ENERGY CONSUMPTION PATTERN OF VARIOUS SOURCES OF ENERGY AND ITS POLICY ANALYSIS IN DISTRICT VIDISHA, MADHYA PRADESH

VIJAY KUMAR

*Professor, Indian Institute of Forest Management, Bhopal.*

*One of the biggest inventions in the history of mankind is fire. This has played a vital role to give whole mankind a distinct place on the universe. This has aggravated the demand for, what we call fuel. Since, this fire is being used for the survival of the human in one way or the other. But the story is not over, the developmental activities have caused increase in demand for fuel, in various forms. There was a time when there was no dearth of the things used as fuel and comparatively the availability of fuel was more than requirements of the people. But over time it has become scarce. Present article is an attempt to find out the status of use of fuel of various kinds in rural area of District Vidisha of Madhya Pradesh and to point out the expected use pattern of fuel by the people of the area. It has been found that fuel wood and electricity consumption is the highest in Pardhi village may be because of the forest tree nearby; dung cake consumption is more in Grunt, may be because of significant livestock population and petrol, diesel consumption is more in Puanala (may be because of poor availability of fuel wood). The preference of the villagers are for LPG followed by electricity, bio-based energy and in last solar.*

*Keywords: Mankind, Fuel, Vidisha, Economics.*

### INTRODUCTION

First of all, Vidisha District as well as Vidisha Block being fuel wood deficient well identified as per official record was selected randomly from this block three Panchayats namely Puanala, Grunt and Kabola (Pardhi) were selected randomly (approximately 3%) and at the last stage one village from each of the Panchayat was selected randomly without replacement. In one Panchayat there are on an average three to four villages. At the last stage approximately 5 per cent respondent house holds were also selected randomly in proportion to their distribution in these three villages and in this way 36, 26 and 30 respondent house holds were selected randomly from Puanala, Pardhi and Grunt villages respectively.

To collect the secondary data the official records and published material were used where as primary data was collected from the pre-tested questionnaire in which major items of information were on the profile of the villagers emphasizing the size of the family, use pattern of various energy sources (Diesel/petrol, fuel wood, cow dung and electricity) existing as well as desired.

The analytical tools used were basically the tabular analysis percentage analysis and weighted average calculations.

## RESULTS AND DISCUSSIONS

Profile of the respondent, fuel consumption pattern of various energy sources and thus preferences have been studied & presented below:

*Profile of the respondents:* Profile of the respondent in terms of their family size in Exhibit-1 has been given.

*Exhibi-1:* Profile of the respondent household in sampled villages of District Vidisha (spread of number of households in different category of sizes of family).

<i>Category of no. of members in a household</i>	<i>Puanala</i>	<i>Pardhi</i>	<i>Grunt</i>
1-4	16 (44%)	9 (35%)	5 (17%)
5-8	14 (39%)	13 (50%)	18 (60%)
9 and above	6 (17%)	4 (15%)	7 (23%)

The smallest size of families was the highest in Puanala (44%) followed by Pardhi and Grunt. But in case of second category of house hold size, the situation was just in reverse. It was (60%) from the Grunt followed by Pardhi (50%) and by Puanala (39%). The biggest size of family (9 and above) was the highest in Grunt village (32%) followed by Puanala (17%) and Pardhi (15%).

### Consumption Pattern of Fuel of Various Sources of Energy

Consumption pattern of fuel wood in three sampled villages have been studied and presented in Exhibit-2 as given below:

*Exhibit-2:* Consumption pattern (per household) of fuel wood in Quintal/month in sampled village of District Vidisha.

<i>Puanala</i>	<i>Pardhi</i>	<i>Grunt</i>	<i>Range of fuel wood consumption</i>
31(86)	15 (.58)	14 (.47)	0-2
1(3)	6 (.23)	15 (.50)	2-4
4(11)	1 (.04)	1 (.03)	4-6
—	4 (.15)	—	6-8

As can be seen from the exhibit-2 that the highest number of consumers of fuel wood is in (0-2 Quintal) category in case of Puanala followed by Pardhi and Grunt, whereas as in second (2-4) category highest consumers are found in Grunt and the lowest number of consumers in Puanala, but the consumers of 6-8 quintal category have been found only in Pardhi. The above finding is very much in match with the profile of the respondents. Puanala is having the highest number of the smallest family size. Hence, the consumption of fuel wood per household is the lowest in Puanala. More

or less other villages profile is also in match with the consumption pattern of fuel wood. Consumption pattern of petrol/diesel per household per month in the sampled villages have been exhibited in Exhibit-3 as given below:

*Exhibit-3:* Consumption pattern (per household) of petrol/diesel in litres/month in sampled village of District Vidisha.

<i>Puanala</i>	<i>Pardhi</i>	<i>Grunt</i>	<i>Petrol/Diesel</i>
11 (.30)	17 (.65)	22 (.73)	0-5
—	4 (.15)	0	5-10
—	02 (.08)	1 (.03)	10-15
25 (.70)	3 (.12)	7 (.24)	15-20

Dispersal of response regarding the consumption of Petrol/Diesel is more apparent in Pardhi (in all consumption categories) as compared to Grunt and Puanala.

The consumption of Petrol/Diesel in the highest consumption category (15-20) is the highest in Puanala and the least in Pardhi. The respondent household percentage is the highest in the 1<sup>st</sup> category of consumption (the lowest consumption category) in Grunt village followed by Pardhi and Puanala. This phenomenon in Puanala is due to the intensive use of tractor and other vehicle for the production & other commercial purpose, although their size of the family (in Puanala village) is comparatively smaller. Consumption pattern of electricity in sampled villages per household has been studied and exhibited in Exhibit-4 as shown below:

*Exhibit-4:* Consumption pattern (per household) of electricity in units/month in sampled villages of District Vidisha.

<i>Puanala</i>	<i>Pardhi</i>	<i>Grunt</i>	<i>Electricity</i>
18 (.50)	3 (.11)	6 (0.2)	0-30
11 (.30)	7 (.27)	7 (0.2)	30-60
2 (.06)	9 (.35)	15 (0.5)	60-90
5 (.14)	7 (.27)	2 (0.1)	90-120

It is apparent from the above exhibit that majority of the household falls under the middle/average level of power consumption i.e. Between 60 to 80 units of electric power consumption, in Grunt and Pardhi both villages but in case of Puanala (50% of the household) the power consumption per household lies in the lowest category of power consumption and further moves in the same proportion. It may be recalled that the majority of the households of Puanala village is of the smallest family size. The consumption pattern of dung cakes in Kg./household/month in sampled villages have been studied & assured and is given in Exhibit-5.

*Exhibit-5:* Consumption pattern (per household) of dung cakes in Kg./month in sampled villages of District Vidisha.

<i>Puanala</i>	<i>Pardhi</i>	<i>Grunt</i>	<i>Dung Cakes</i>
31 (.86)	19 (0.73)	9 (0.30)	0-50
3 (.08)	4 (0.16)	16 (0.54)	50-100
2 (.06)	3 (0.11)	5 (0.16)	100-150

In case of Puanala high percentage of respondents (86%) use smaller quantity of cow dung i.e. 0-50 Kg. and a small percentage i.e. 6 per cent only fall in the 100-150 Kg. consumption category. The same pattern is true in case of Pardhi village. This finding seems in match with the distribution of household in various categories of family size in these villages. However, in case of Grunt, the use of dung cake is more predominant may be because of a significant population of livestock. In case of Grunt i.e. 30% of respondents use cow dung as a source of energy in the category of 0-50 Kg's; 54% falls in 50–100 Kg. category.

The weighted average consumption pattern of fuel from various sources of energy in sampled villages have been worked out to see the position at a glance and has been presented in Exhibit-6.

*Exhibit-6: Weighted average consumption per household pattern of fuel from various sources of energy in sampled villages of District Vidisha*

<i>Village Energy items</i>	<i>Puanala</i>	<i>Pardhi</i>	<i>Grunt</i>
Fuel wood (Quintal/month)	1.55	2.79	2.12
Petrol/Diesel (Litre/month)	13	5.84	6.39
Dung Cake (Kg./month)	35	44	68
Electricity (Unit/month)	40.2	68.4	60

While compiling the consumption pattern of all the sources of energy using weighted average method, one comes to the conclusion that the use of fuel wood is the highest in case of Pardhi followed by Grunt and Puanala respectively. It may be because of the easy fuel wood availability and forest area nearby. But the consumption of fuel in the form of Petrol/Diesel is high in Puanala followed by Grunt. It may be noted that the use of tractor and other vehicles for commercial purpose is more apparent in Puanala. The consumption of dung cake is highest in case of Grunt perhaps because of large number of livestock in the village as seen during study and lowest i.e. 35 Kg. in Puanala, but the consumption of electricity is slightly high in Pardhi than Grunt.

*Preference for various energy sources:* Preferences of various energy sources of the sample respondents from the selected villages have been shown in Exhibit-7.

*Exhibit-7: Preferences for various energy sources by the respondents of the sampled villages of district Vidisha.*

ENERGY CONSUMPTION PATTERN OF VARIOUS SOURCES OF ENERGY AND ITS POLICY...

<i>Items of energy</i>	<i>Gobar Gas</i>	<i>LPG</i>	<i>Electricity</i>	<i>Solar Light</i>	<i>Others</i> <i>(Human excreta, Bio Diesel based)</i>
<i>Village Name</i>					
Puanala	8 (0.25)	14 (0.54)	10 (0.40)	4 (0.23)	8 (0.40)
Pardhi	10 (0.32)	12 (0.46)	10 (0.40)	7 (0.41)	5 (0.25)
Grunt	14 (0.43)	0	5 (0.20)	6 (0.36)	7 (0.35)
Total	32 (1)	26 (1)	25 (1)	17 (1)	20 (1)

As apparent from the above exhibit, Gobar Gas has scored the highest number of respondents in its favour in general followed by LPG, Electricity, others (involving arrangements like Human excreta, Jatropha Biodiesel) and in last the solar energy. The preference of Grunt people is more for Gobar Gas followed by solar energy and others. The preference of Pardhi village is more for LPG, electricity followed by solar energy and Gobar gas where as the preference of Puanala village is for LPG, Electricity followed by other source of energy and Gobar gas.

### CONCLUSION

In this study, it has been found that the fuel wood consumption is more prevalent in the village where size of the family (household) is thin. This phenomenon was further facilitated by the availability of the forest area nearby. In the same way, consumption of dung cake is more apparent in the village where livestock population is of a greater size. But the preference of the villagers is for LPG followed by electricity and energy based on biodiesel/human excreta/Gobar gas and in last for solar energy.

### Reference

- Barry Munslow *et. al.* (1988), "*The Fuelwood Trap*", London: Eastern Publications Ltd.
- Satish Kumar Mehta (2008), "*Bio-fuels: Marketing Strategies and Impact on Rural Development*", Jaipur: Aawiskar Publishers.
- Shame R. D. (1992), "*Economics of Fuelwood Production in Wastelands*", India: Concept Publishing Co. Delhi.
- Vimal O. P. & Bhatt M. S. (1989), "*Wood Energy System*", Delhi, K.L. Publication.
- Vimal O. P. and Tyagi P. D. (1986), "*Fuelwood from Wastelands*", New Delhi: Yatan Publication.