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Research Paper

Solar lantern: A cheap and best technology for rural household

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ABSTRACT : Energy is a life line of modern society and its requirement is increasing as the population is growing. As all sources of energy is limited, therefore, to fulfill the growing need of energy, it is essential to look for renewable energy resources especially 'Solar energy', which is clean and available in India. the study was undertaken to promote the use of solar lantern in the village Aurawatand of Naugarh block of Chandauli district. It is a small village having forty one families. A solar lantern was given to each family of the village and impact was seen after a gap of five to six months. It was significant to observe that this solar lantern brought a qualitative change in the life of the villagers, as it is smoke free, easy to use and time is utilized fruitfully due to its five and six hours uninterrupted light. It not only provides light but saves money spent in purchasing of kerosene oil and saves from ill effect of kerosene.

KEY WORDS : Solar lantern, Smoke free, Rural household

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An energy crisis is a major social and environmental issue (Jain). Scientists all over the world have come out with several technological options for mitigating the gravity of the problem. One such technological option that made its formal entry into the Indian rural homes is the "solar energy". Vigorous efforts during the past two decades are now bearing fruit as people in all walks of life are more aware of the benefits of solar energy (Grover and Verma, 1996). In view of this, a study was undertaken with the fallowing objectives :

– To study the socio-demographic background information of the respondents.
– To analyze the impact of solar lantern in the life of respondents.

RESEARCH METHODS

The present study was undertaken in the village Aurawatand, Naugarh block of Chandauli district. It is a small village of having 41 families which are mostly schedule caste and schedule tribes except few Yadavas and Muslims. Each family of the village was given one solar lantern, this way 41 lanterns were distributed. Villagers were exposed towards different solar equipments through an 'exhibition on solar equipments'. The equipment kept for the exhibition were solar lantern, solar home light, solar street light, solar dish cooker, solar box cooker and solar drier (Fig. 1). All these equipments are still there, placed in the central place where is run a Junior High School. All villagers men, women and adolescent boys and girls were trained about their uses and advantages. Since it was a project sponsored by Department of Science and Technology, New Delhi, therefore team of the project often visited the villages and stayed there on regular basis, therefore any problem in their lantern was rectified. If it was not possible to repair the defect there, lanterns were brought at NEDA centre Varanasi to repair. In each visit, one or two lanterns were brought and got repaired. To observe its impact, data were collected after six months of giving the lanterns through structured interview schedule and was analyzed by using appropriate statistical tools.

RESEARCH FINDINGS AND DISCUSSION

The findings of the study were discussed under the fallowing points:

– Socio-economic background information of the

respondents.
– Impact of solar lantern on respondents.

Socio -economic background information of the respondents:

Table 1 indicates that nearly half of the female respondents (41.46 %) were in the age group of 21 to 30 years while maximum male respondents (31.70%) were above 51 years of age. The data also reveal an important finding that (90.24%) respondents were working in their agriculture field and seasonal labour only 9.75 per cent were migrated labour. It proves that villagers move out only in forced conditions. Land holding of the villagers was very small except three or four families they too had more than 8 bighas of land. Literacy level in both male and female is very less and requires effort from Government for the provision of education.

Table 1 : Socio economic characteristics of the villagers

Characteristics	Categorization	Frequency of respondents (n=41)		Percentage (%)	
		(M)	(F)	(M)	(F)
Age	Below 20	1	4	2.43	9.75
	21 – 30	10	17	24.3	41.46
	31 – 40	12	7	29.26	17.07
	41 – 50	5	6	12.19	14.63
	Above 51	13	7	31.70	17.07
Occupation	(Both agriculture and labour work)	37		90.24	
	Migrated labour	4		9.75	
Caste	Muslim and Yadav (OBC)	5 + 3 (8)		19.51	
	Harijan (SC)	6		14.63	
	Kharwar (ST)	27		65.85	
Land holding	Landless	3		7.31	
	1 – 10 Biwsa	5		12.19	
	11 – 20 Biwsa	5		12.19	
	1 – 3.5 Bigha	23		56.09	
	4 – 7.5 Bigha	4		9.75	
	8 – 14.5 Bigha	1		2.43	
Religion	Hindu	36		87.80	
	Muslim	5		12.19	
Education		(M)	(F)	(M)	(F)
	Illiterate	27	33	65.85	80.48
	Literate	14	8	34.14	19.51
Family type	Nuclear	35		85.36	
	Joint	6		14.63	
Annual income in (Rs.)	Upto 15 thousand	10		24.39	
	16 – 20 thousand	29		70.73	
	21 – 25 thousand	2		4.87	
Size of the family	Small (upto 3 members)	7		17.07	
	Medium (4 to 5 members)	12		29.26	
	Large (6 to 9 members)	14		34.14	
	Very Large (<9 members)	8		19.51	

Impact of solar lantern :

***Exposure of the villagers regarding solar energy through exhibition of solar equipments* :**

In the beginning of this research project the village community was reluctant and did not respond but after two to three continuous visits made them to interact. Following solar equipments were displayed and demonstrated (Fig. 1).

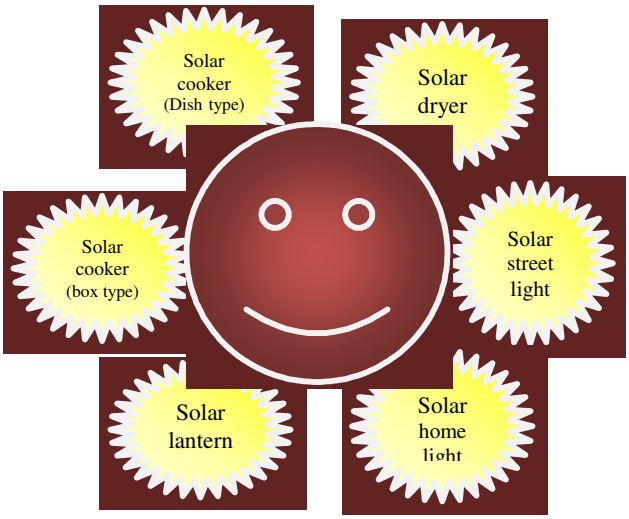

Fig. 1 : Various solar equipments

Demonstration of solar lantern :

For sustaining interest of the villagers, detailed training was provided to the villagers at different levels. Demonstration method was used for creating awareness and imparting functional knowledge of various solar equipments, which involved knowledge regarding repairing and maintenance too. As the solar equipments were placed in the school, so all the children, women and men were able to participate in the training process. Solar equipments have their own utility and advantage due to non-availability of electricity in the village; therefore the need of solar energy was obvious. Different food items were cooked in solar cookers placed in the school. During the repeated demonstration, functional knowledge was provided to the villagers of various solar equipments. All other equipments were placed in a centrally located school for live demonstration of the villagers.

Utility and advantages of solar lantern and its impact on monthly consumption of kerosene :

From Table 2, it can be observed that before getting the solar lantern consumption of kerosene oil was upto four litre by respondent 17.07 per cent, which increased upto 70.73 per cent respondents after getting the solar lantern. It also shows that consumption of five to six litre kerosene oil by 78.0 per cent respondents has decreased to 29.26 per cent respondents. Absolute decrease was mentioned in the consumption of seven to eight litres kerosene oil, which was 4.87 per cent respondents reached to nil. It proves that after the use of solar light, the consumption of kerosene oil decreased remarkably which ultimately saved money, energy and time and made the enivorment free from pollution kept it clean and green (Fig. 2).

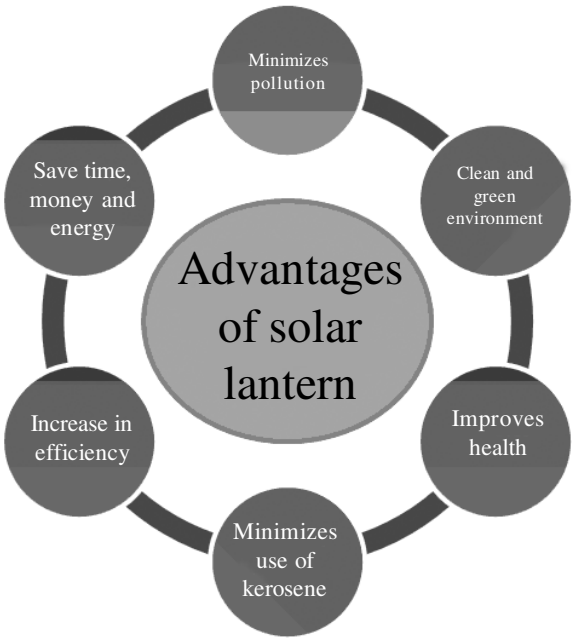

Fig. 2 : Advantages of solar lantern

Table 2 : Distribution of families based on monthly consumption of kerosene in litres

Sr. No.	Categories	Frequency of respondents before using solar lantern (n = 41)	Frequency of respondents after using solar lantern (n = 41)
1.	Consumption up to 4 litres	7 (17.07)	29 (70.73)
2.	Consumption 5 to 6 litres	32 (78.0)	12 (29.26)
3.	Consumption 7 to 8 litres	2 (4.87)	-

*Figure in parentheses indicate percentage

Although solar lantern was distributed to each family residing in the village and one street light was installed in the centre of the village. Installation of street light in the centre of a village made the villagers to utilize their time especially after sunset to interact socially more and doing Bhajan and Kirtans at night. During the rainy season, it was very convenient to go out of the home for their natural calls. Women of the village were seen worshiping village deity their Goddess at midnight in the forest.

Impact of solar lantern on respondents :

As the whole village is below poverty line, therefore realizing the need of the villagers, provision was made in the project to provide, one solar lantern to each family of the village.

Majority of the respondents (100 per cent) reported that solar lantern had changed their lives in above several ways and had positive impact on them (Fig. 3).

Fig. 3 : Impact of solar lantern

Conclusion :

It can be conclude that provision of solar lantern has increased the productive hours of women and family, minimized the drudgery faced by women and added the opportunities for the joyful living such as religion-cultural activities. Before the distribution of solar lantern, whole village used to be silent after darkness but now it is changed and enlighten by the beautiful gift called "solar energy".

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