

Energy saving practices followed by rural and urban homemakers of Ludhiana district while cooking

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■ **ABSTRACT** : The world is fast heading towards energy crisis. So, we need to rapidly move into a policy to reduce energy needs. A shift to alternate energy use and renewable energy sources that are used judiciously and equitably would bring about environmental-friendly and sustainable lifestyles. So, the present investigation was planned to study the different energy saving practices which are followed by rural and urban homemakers of Ludhiana district. The study was conducted on 60 rural and 60 urban homemakers of Ludhiana and the results showed that most of the rural as well as urban respondents were using energy saving practices in their kitchen, such as using optimum quantity of water for cooking, using lid on pans to prevent heat loss, etc. As regards use of solar energy only 6.67 per cent of the urban respondents were using it for various purposes in their homes as against none of their rural counterparts.

■ **KEY WORDS** : Energy crisis, Energy saving practices, Solar energy

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Household energy consumption accounts for a major part of total energy consumption being about 50 per cent in the developing countries. In a household, the energy is required primarily for cooking and lighting. Cooking consumes the largest amount of total energy consumption in a household. The household energy needs take up a substantial portion of the resources of many households. This sector of energy consumption is not only very large, but also draws heavily on fuels that have important consequences for economic development for example, fuel wood and dung. Overuse of these fuels may create severe environmental problems and affect agricultural productivity.

The sun is the major source of light on earth. Sun's light can be converted into energy called solar energy. The world is fast heading towards energy crisis. So, we need to rapidly move into a policy to reduce energy needs. The present research was planned to study the different energy saving practices which are followed by rural and urban homemakers of Ludhiana district and utilisation pattern of solar energy by them.

■ RESEARCH METHODS

The study was conducted in two urban localities of Ludhiana city and two villages of Ludhiana district. For the selection of the urban respondents, out of four zones of Ludhiana city, west zone was randomly selected. From the west zone two localities namely, Punjab Agricultural University Campus and Kitchlu Nagar were randomly selected. From each of these localities, 30 households were randomly selected; thus the urban sample comprised of 60 households.

For selection of rural sample, Sidhwan Bet block was randomly selected out of 11 blocks of Ludhiana district. From this block, two villages namely, Sawaddi Kalan and Birk were randomly selected out of the total list of 92 villages. Further, thirty randomly selected households were taken from each of the two selected villages, Sawaddi Kalan and Birk, thus selecting the rural sample of 60 households.

For collecting the relevant data as per the objectives of the study, a self-structured interview schedule was prepared. The well-structured interview schedule was pre-

tested before using it for actual data collection. For this purpose, 20 respondents were selected from a non-sampled area to determine its suitability and accuracy. After pre-testing of interview schedule, necessary modifications were made and the final interview schedule was prepared.

■ RESEARCH FINDINGS AND DISCUSSION

The experimental findings obtained from the present study have been discussed in following heads:

Energy saving practices followed while cooking :

As regards energy saving practices while using kerosene oil/LPG (Table 1), all of the rural respondents were found to use optimum quantity of water for cooking in order to save fuel, as surplus water consumes additional fuel which could otherwise be saved, and they used to follow it always as indicated by the mean score of 2.00. In urban category, 90 per cent respondents followed it almost always as indicated by the mean score of 1.98. 'Using a lid on a cooking vessel or pan' can save fuel by reducing cooking time as it prevents heat loss. All the rural and 90 per cent urban respondents followed this practice 'always' (mean score=2)

and (mean score=1.93), respectively. These differences in the responses of rural and urban category were found to be statistically significant at 5 per cent level of significance. These results are in conformity with those of Oberoi *et al.* (1992) who also reported that majority (96.2%) of the rural families were using only the required quantity of water for cooking and almost all of them (99.4%) covered the cooking utensils while cooking. Pressure cooking cooks food quickly and thereby saves fuel. The temperature inside a pressure cooker can go beyond 110°C, which reduces the time needed to cook food (Anonymous, 2011). In addition, very little steam escapes between the pot and lid, thus, requiring less water to cook the food. About 93.33 per cent rural respondents were found to use pressure cooking 'almost always' as indicated by the mean score of 1.93 whereas, in urban category 90.00 per cent were using pressure cooking 'almost always' as indicated by the mean score of 1.92. These results are quite in line with the findings of Pangotra (1981) who also reported that pressure cookers were owned by all the urban families whereas, only 52 per cent rural families possessed them. All the rural and 90 per cent of urban respondents reported that they avoided overcooking of

Table 1: Distribution of respondents according to energy saving practices and frequency of their use while cooking

Energy saving practices	Usage				Frequency of use				t-value
	Rural (n=60)	Urban (n=60)	Z-value	Total (n=60)	Rural		Urban		
					Mean scores	S.D.	Mean scores	S.D.	
Use optimum quantity of water for cooking	60(100.00)	54(90.00)	2.51*	114(95.00)	2.00	0.00	1.98	0.13	1.19
Use lid on pans to prevent heat loss	60(100.00)	54(90.00)	2.51*	114(95.00)	2.00	0.00	1.93	0.25	2.17*
Use pressure cooking	56(93.33)	54(90.00)	0.40	110(91.67)	1.93	0.26	1.92	0.28	0.19
Do not overcook vegetables	60(100.00)	54(90.00)	2.51*	114(95.00)	2.00	0.00	1.98	0.13	1.19
Always use dry pan for cooking	60(100.00)	52(86.67)	2.80**	112(93.33)	1.83	0.38	1.86	0.35	0.43
Use heat of <i>Tawa</i> after making <i>Chapattis</i>	59(98.33)	48(80.00)	2.97**	107(89.17)	1.93	0.25	1.54	0.50	5.24**
Light stove only after ingredients are ready	55(91.67)	54(90.00)	0.04	109(90.83)	1.35	2.70	1.88	0.33	1.27
Put off an idle flame once	55(91.67)	54(90.00)	0.04	109(90.83)	2.00	0.00	1.95	0.22	1.69
Reduce the flame when boiling starts	53(88.33)	54(90.00)	0.53	107(89.17)	1.92	0.27	1.97	0.18	1.13
Pre soak pulses before cooking	53(88.33)	53(88.33)	-	106(88.33)	1.72	0.45	1.73	0.45	0.11
Check for leaks in the regulator, hoses and burner	51(85.00)	54(90.00)	0.77	105(87.50)	1.78	0.42	1.98	0.13	3.34**
Keep the refrigerated food items outside before heating	51(85.00)	54(90.00)	0.77	105(87.50)	1.98	0.14	1.91	0.29	1.56
Use broad and flat bottomed vessels	51(85.00)	53(88.33)	0.58	104(86.67)	1.51	0.50	1.70	0.46	2.02*
Entire family takes meals at the same time	48(80.00)	49(81.67)	0.23	97(80.83)	1.27	0.45	1.69	0.47	4.49**
Use the small burner or lower flame more often	47(78.33)	42(70.00)	1.04	89(74.17)	1.64	0.49	1.57	0.50	0.67
ISI marked kerosene and LPG stoves	43(71.67)	54(90.00)	2.52*	97(80.83)	2.00	0.00	1.98	0.13	1.01
Use bio gas/solar cooker/improved <i>Chulha</i>	0(0.00)	3(5.00)	-	3(2.50)	0.00	0.00	1.00	0.00	-
Use separators in pressure cooker	0(0.00)	5(8.33)	-	5(4.17)	0.00	0.00	1.40	0.55	-
Store hot water required in a insulated bottle	5(8.33)	29(48.33)	4.27**	34(28.33)	1.60	0.55	1.45	0.51	0.60
Spread awareness of fuel conservation to others	0(0.00)	27(45.00)	-	27(22.5)	0.00	0.00	1.40	0.50	-

Note: Figures in parentheses indicate percentages, multiple responses, Scores: Never=0, Sometimes=1, Always=2

* and** Indicate significance of value at P=0.05 and 0.01, respectively

vegetables to avoid wastage of fuel. This practice was followed always by respondents from both the categories. Oberoi *et al.* (1992 a and b) also found that most of the families cooked food for the required time only. All the rural respondents knew that they should always use dry pan to cook the food otherwise gas will be wasted just to evaporate the water before oil is added to the pan and they always (mean score= 1.83) used dry pan whereas, in urban category 86.67 per cent respondents were found to use dry pan to cook the food always as indicated by the mean score of 1.86. This difference in the responses was found to be statistically significant at 1 per cent level of significance.

After making *Chapattis* we can place the metallic bowls of *Dals* and *Sabzis* on the *Tawa* to warm them and thus, can save fuel. In rural category, 98.33 per cent respondents used to follow this practice 'always' as indicated by the mean score of 1.93. In urban category, 80.00 per cent respondents used to follow this but 'sometimes' as indicated by the mean score of 1.54. These differences in the responses of rural and urban respondents were found to be statistically significant. Lighting the stove only after keeping all the ingredients within reach and ready for cooking can save a lot of fuel. 91.67 per cent rural respondents used to follow this but 'sometimes' as indicated by the mean score of 1.35. In urban category, 90 per cent respondents were found to follow this practice always as indicated by the mean score of 1.88. A large number of rural (91.67 per cent) as well as urban respondents (90 per cent) were found to 'put off an idle flame at once' to save fuel. Respondents from both the categories were found to practice this 'always' (mean score=2.00 and 1.95 for rural and urban categories). When boiling starts a low flame is enough to keep it boiling, hence, reduction in the flame reduces wastage of fuel. In rural category, 88.33 per cent respondents 'always' followed this practice (mean score=1.92) as against 90 per cent of urban respondents who did same (mean score= 1.97) (Table 1). Soaking pulses in water before cooking reduces the cooking time and thus, saves fuel, and 88.33 per cent respondents in each (rural and urban) category were found to follow this practice 'almost always' as indicated by the mean score of 1.72 and 1.73, respectively. Sandhu and Oberoi (2002) in a study also found that rural families were well aware of the energy saving technique of soaking pulses before cooking and they used to follow this practice fully or partially in daily routine. Hence, these results are in line with the results of present investigation. In rural category, 85 per cent respondents used to regularly check for leakage in the regulator, hoses and burner to save fuel as indicated by the mean score of 1.78 whereas, in urban category, 90 per cent respondents used to check them regularly as indicated by the mean score of 1.98. Keeping the refrigerated food items outside to bring them to the room temperature before heating them reduces the heating time and thus saves fuel. In rural category, 85 per

cent respondents followed this practice 'always' as indicated by the mean score of 1.98 whereas, in urban category, 90 per cent respondents followed it always (mean score=1.91).

Using broad and flat bottomed vessels cover the flame entirely and thus, saves fuel. About 85 per cent of the rural respondents used broad and flat bottomed vessels but 'sometimes' as indicated by the mean score of 1.51 whereas, in urban category 88.33 per cent respondents followed this practice 'almost always' as indicated by the mean score of 1.70. When entire family take meals at the same time, it eliminates the need to reheat food everytime anyone wants to eat and thus saves fuel and 80 per cent of the rural respondents were found to follow this practice but 'sometimes' as indicated by the mean score of 1.27. In urban category, 81.67 per cent respondents used to follow it whenever possible as indicated by the mean score of 1.69. Using the small burner or lower flame more often can save fuel and 78.33 per cent rural respondents used small burner or lower flame whenever possible as indicated by the mean score of 1.64 whereas, in urban category, 70 per cent respondents used to follow this but only 'sometimes' as indicated by the mean score of 1.57.

A large percentage of rural respondents (71.67 per cent) were found to use ISI marked kerosene and LPG stoves to save fuel and they 'always' used them (mean score= 2.00). In urban category, 90 per cent respondents were found to use such stoves 'always' as indicated by the mean score of 1.98. This difference in the response was found to be statistically significant at 5 per cent level of significance. Using biogas, solar cooker and improved *Chulhas* can help to save conventional sources of energy but none of the rural respondents was using it. In urban category, only 5 per cent respondents were using solar cooker 'sometimes' as indicated by the mean score of 1.00. These findings are not in line with the findings of Miglani *et al.* (1990) who in a study observed that most of the rural families used to use smokeless *Chulhas* daily. However, Goyal and Kakar (1989) in a study in Ludhiana found that majority of the respondents were the regular users of the solar cooker. Using separators in pressure cooking saves a lot of cooking time and hence saves considerable amount of fuel. But, none of the rural respondents was following this practice. In urban category also only 8.33 per cent respondents were following this practice and only 'sometimes' as indicated by the mean score of 1.40. By spreading awareness of kerosene and LPG conservation amongst our friends and relatives we can save a lot of fuel while performing routine activities. But, none of the rural respondents used to do so whereas, in urban category, 45 per cent respondents used to spread such awareness but only sometimes as indicated by the mean score of 1.40 (Table 1).

On the whole, it can be concluded that a large number of rural as well as urban respondents were found to be using

these energy saving practices and they were using these practices 'almost always' and awakening to such practices must have been due to media. The other reasons could also be high costs and sometimes scarcity of these energy sources which might have led to the respondents to adopt these energy saving practices and thus lead to saving money and energy sources.

Utilization of solar energy :

It can be observed from Table 2 that only 6.67 per cent urban respondents used solar energy for various purposes in their homes. It further indicates that three urban respondents used solar energy for cooking food and for dehydration purpose, while only one respondent used it for charging calculator battery. On the whole it can be concluded that very few respondents were using solar energy for various purposes which may be because of lack of awareness and availability of technology. In a country like India, there is a lot of scope of using solar energy, so its use needs to be encouraged for the conservation of non-renewable energy sources.

Table 2: Distribution of urban respondents according to the utilization of solar energy

Utilize solar energy	Urban (n=60)
Yes	4(6.67)
Purpose	
Cooking food	3(5.0)
Dehydration	3(5.0)
Others (charging calculator battery)	1(1.33)

Note: Figures in parentheses indicate percentages

Conclusion :

Based on the findings of the study it can be concluded that a large number of rural as well as urban respondents were found to be using various energy saving practices in their kitchen and they were using these practices 'almost

always'. But very few of the urban and none of the rural respondents were using solar energy for their household activities. In a country like India, there is a lot of scope of using solar energy, so its use needs to be encouraged for the conservation of non-renewable energy sources.

A shift to alternate energy use and renewable energy sources that are used judiciously and equitably would bring about environmental-friendly and sustainable lifestyles.

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