

CONSTRAINTS AFFECTING ADOPTION OF BIOGAS TECHNOLOGY BY RURAL HOUSEHOLDS OF KANPUR

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ABSTRACT

The conventional energy reserves are limited, they have become scarce and expensive day-by-day. The Government has been making tremendous efforts to propagate non-conventional energy use so that energy crises can be reduced, but several constraints have been affecting its adoption. Thus, keeping in view this fact, a study on constraints affecting adoption of biogas technology was conducted on 120 rural women of Sarsaul block of Kanpur during 2002. The study revealed that the majority of respondents perceived the constraint namely “high cost for installation of biogas plant” as most important. The next in importance was “shortage of sufficient cow dung” as perceived by 28.33 per cent respondents. It was also observed that with the increase in family educational status, constraints affecting adoption of biogas technology have reduced.

Key words : Constraints, Adoption, Technology

INTRODUCTION :

Energy is the most important component for economic development of a country and with the advancement in science and technology and industrial development, its need has increased manifold all over the world. This is more so in developing countries like India where it has reached to a critical stage. As a consequence, poor people of rural India are most affected by it. Eighty per cent rural population consume only 20 per cent of total energy produced in India. The domestic sector is the major sector of energy demand and consumption accounting for 55-60 per cent of the total energy use. The major portion of energy demand in rural areas for cooking and heating is met through locally available non-commercial energy sources which are becoming scarce because of phenomenal growth in the population as well as devastating exploitation of natural wealth. Under these circumstances, the non-conventional energy sources have come to occupy an important place in the scheme of thing, but the use of these energy resources by the actual users is still a challenging and difficult task. The Government has undertaken gohar gas programme on large scale with the provision of subsidy since the last two decades and various institutions and agencies have made their efforts to popularise this technology for solving the energy crisis but on account of some constraints, most of the people could not adopt this technology. Thus, keeping in view this fact, a study on constraints affecting adoption of biogas technology by rural households was conducted in Kanpur during 2002.

METHODOLOGY :

The Sarsaul block of Kanpur district where NCED programme has been under progress was selected for the study purpose. A two stage random sampling procedure

was adopted for selection of villages and rural households. First, a list of villages where NCED programme is under progress was prepared and from this list, four villages were selected randomly. After selection of villages, a list of households falling under these selected villages and having biogas plants was prepared and from this list 120 households were selected randomly. From each selected household, one responsive women was taken as respondent. The data were collected by administering of structural interview schedule personally by the investigator to the respondents. Different independent and dependent variables were selected as per requirement of the study and measured by use of appropriate tools. The scoring was done as per schedule instructions. The socio-economic status (SES) and family educational status were also calculated as :

SES	Total score
Low	15-30
Medium	31-40
High	41-50
Family educational status	Percentage of total score
Low	Up to 33
Medium	34-66
High	67-100

$$\text{Family educational score} = \frac{\text{Total educational score of the family}}{\text{Total number of legible members of the family}}$$

The collected data were tabulated and analysed statistically by applying zero-order correlation coefficient. Its significance was tested by t -test. The meaningful inferences were drawn accordingly.

RESULTS AND DISCUSSION :

The socio-economic profile of the respondents revealed that 44.17 per cent respondents were of 20 to 35 years of age. About 37.50 per cent respondents were

having education up to primary level whereas 47.50 per cent families were having low educational status (Table 1).

Table 1. Socio-economic profile of respondents
(N =120)

Socio-economic variable	Frequency	Percentage
Age group (years)		
20-35	53	44.17
35-50	46	38.33
Above 50	21	17.50
Educational level		
Illiterate	37	30.83
Up to Primary	45	37.50
Up to Secondary	21	17.50
Above Secondary	17	14.17
Caste		
Forward	61	50.84
O.B.C.	40	33.33
S.C.	19	15.83
Family type		
Nuclear	33	27.50
Joint	87	72.50
Family income		
Up to 5000	69	57.50
5000-10000	36	50.00
10000 and above	15	12.50
Occupation		
Caste occupation	40	33.33
Farming	68	56.67
Service	12	10.00
Land holding		
Landless	27	22.50
Marginal	31	25.83
Small	45	37.50
Large	17	14.17
Family educational status		
Low	57	47.50
Medium	38	31.67
High	25	20.83
Herd size		
Up to 2 animals	65	54.17
3 - 5 animals	37	30.83
More than 5 animals	18	15.00

Development of new technologies is not, generally, the major problem. The main problem as it exists today is that of its acceptance by the intended beneficiaries. They face several constraints like educational, communicational, technical, operational, organisational, etc. The important constraints faced by respondents are presented in Table 2.

It was observed that 45 per cent respondents have

ranked "high cost for installation of biogas plant" constraint as most important. The "difficult to use in various seasons" constraint was ranked second by 40 per cent respondents. They feel that the biogas plant being an expensive innovation is not suitable economically to the average rural families. Complication in its installation and shortage of sufficient dung were another major constraints perceived by respondents.

Table 2. Constraints faced by respondents (N = 120)

Constraint	Frequency*	Percentage	Rank
High cost for installation of biogas plant	54	45.00	I
Complication in installation of biogas plant	39	32.50	III
Lack of space for installation of biogas plant near house	27	22.50	V
Insufficient bank loan	19	15.83	VIII
Shortage of sufficient cow dung	29	24.17	IV
Difficult to use in various seasons	48	40.00	II
Habitual to work on traditional method	21	17.50	VII
Unhealthy atmosphere in the house	18	15.00	IX
Food items cooked on biogas stove are not of existing taste	16	13.33	X
Inadequate follow-up services provided once technology has been installed	24	20.00	VI

* Multiple response

Table 3. Relationship of constraints in acceptance of biogas technology with socio-economic variable

Socio-economic variable	Correlation coefficient (r)	P value
Age	0.145	> 0.05
Education	-0.189	< 0.05
Family income	-0.167	> 0.05
Family educational status	-0.236	< 0.05
Land holding size	-0.098	> 0.05

Although, Jha (1994) and Kaushik and Verma (1994) did not observe significant relationship of age with acceptance of biogas technologies, in this study this relationship was found positively correlated which means that with increase in age, respondents face several constraints in accepting biogas technologies. Table also shows that as educational status of family as well as respondents increases, they face less constraints because they become more aware about operational aspects. Sharma (1981), Jalota (1982), Bajaj and Nayak (1987) and Nagpal and Yadav (1991) had also observed that educational status of family directly affect acceptance of biogas technology and their relationship is significant.

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