Available online at www.ijpab.com

DOI: http://dx.doi.org/10.18782/2320-7051.2995

ISSN: 2320 – 7051

Int. J. Pure App. Biosci. **5 (4):** 2097-2101 (2017)

Research Article

International Journal of Pure & Applied Bioscience

OPEN ACCESS

Impact of Biogas Plant on the Socio-Economic Status of Biogas Users

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Received: 19.05.2017 | Revised: 30.05.2017 | Accepted: 1.06.2017

ABSTRACT

Biogas, a sustainable renewable energy, has positive environmental impacts at local, national and global levels. This study was conducted in Barwani district of Madhya Pradesh to evaluate the impact of adoption of biogas plant on the socio-economic status of biogas users. Biogas fuel helps to reduce greenhouse gas emissions by displacing the consumption of fuel wood, agricultural residues and kerosene. The biogas used in a sustainable basis assures the CO2, associated with biogas combustion will be reabsorbed in the process of the growth of fodder and food for animals. All the CH4 and CO2 emissions that are associated with the combustion of fuel wood can be accounted as being replaced by a biogas system. Biogas technology is being promoted in India chiefly under the aspect of energy. The focus on this derives from the crucial energy supply situation for the population in the country.

The result revealed that the majority (62.00 per cent) of the respondents possessed medium impact of adoption of biogas plant on the socio-economic status, while 21.33 per cent of the respondents possessed high and 16.67 per cent possessed low impact of adoption of biogas plant on the socio-economic status.

Key word: *Biogas, Socio-economic, Renewable, Greenhouse*

INTRODUCTION

The main challenge of present world is to harness the energy source which is environment friendly and ecologically balanced. This need has forced to search for other alternate source of energy. But unfortunately the new alternative energy sources like the solar, hydro, wind etc. require huge economical value and technical power to operate, which seem to be very difficult for the developing countries like Nepal. In the present moment biogas energy can be one and only reliable, easily available and economically feasible source of alternative and renewable source which can be managed by locally available sources and simple technology for these rural villages. Biogas is the mixture of gas produced by methanogenic bacteria while acting upon biodegradable materials in an anaerobic condition as reported by Desai *et al*[2].

Cite this article: Patel, N., Gupta N., Singh, M., Bhargav, K.S., Laxmi and Pandey A., Impact of Biogas Plant on the Socio-Economic Status of Biogas Users, *Int. J. Pure App. Biosci.* **5(4):** 2097-2101 (2017). doi: http://dx.doi.org/10.18782/2320-7051.2995

This gas is principally composed of methane (CH4) and carbon dioxide (CO2). Methane is virtually odorless and colorless. It burns with a smokeless clear blue flame and is non toxic. Biogas, a sustainable renewable energy, has positive environmental impacts at local, national and global levels. Biogas fuel helps to reduce greenhouse gas emissions by displacing the consumption of fuel wood, agricultural residues and kerosene. The biogas used in a sustainable basis assures the CO2, associated with biogas combustion will be reabsorbed in the process of the growth of fodder and food for animals as reported by Sallaku *et al*[5]. All the CH4 and CO2 emissions that are associated with the combustion of fuel wood can be accounted as being replaced by a biogas system. Biogas, a sustainable renewable energy, has positive environmental impacts at local, national and global levels. Below are some environmental benefits associated with the use of biogas technology. Replacing biomass energy with biogas could help to solve a lot of problems that are typically found with biomass fuels. The indoor air quality of homes will be dramatically improved as a result of employing biogas stoves instead of burning fuel wood, straw and dung cakes. This would mean that a lot of the problems with hazardous smoke particles would be avoided[4]. In addition, installation of biogas systems has resulted in better management and disposal of animal dung and night soil. The slurry that has been digested is a high grade fertilizer.

For keeping the view of the present study titled "Asses the impact of biogas plant vis a vis socio-economic status" was undertaken with the help of following specific objectives.

To study the profile of biogas users.

1. To evaluate the impact of adoption of biogas plant on the socio-economic status of biogas users.
2. To find out the relationship between the profile of biogas users and impact of adoption of biogas plant on their socio-economic status.

MATERIALS AND METHODS

This study was conducted in Barwani district of Madhya Pradesh. Barwani district located in the Nimar region of Madhya Pradesh and it was selected purposively on the basis of tribal area covered by the beneficiaries of biogas project. In the present study the sample were drawn through application of multi stage sampling method. Barwani district comprises of seven blocks namely Rajpur, Thikri, Sendhwa, Pansemal, Pati, Niwali and Barwani. Ten villages were selected from these 2 blocks (Barwani and Rajpur) randomly and considered for study on the basis of number of biogas beneficiaries. A list of biogas beneficiaries of each selected village was prepared, out of which an equal percentage of biogas beneficiaries (15 beneficiaries) from each selected village was selected on the basis of simple random sampling method, to make the total sample size approximately 150 for this study. All the selected farmers were interviewed personally using a well-structured interview schedule. For analysis of collected data, descriptive statistics and analytical statistics in this study was used.

RESULTS AND DISCUSSION

In order to know the background and socio-economic status of the respondents, it is important to analyze these characteristics. In all 7 socio-economic variables were studied using appropriate tools. The analyze data showed that maximum respondents were middle age group (59.33 %) and medium education level (66.66%), having medium annual income (60.67%) and land holding (63.33%). Majority of biogas users had medium family size (60.66%) and number of animals (68.00%). Majority had medium level of economic motivation (58.00%). Majority of the respondents had favorable attitude towards the use of biogas plant (70.00%), while 15.33 per cent had unfavorable and 14.66 per cent had more favorable attitude towards the use of biogas plant. Similar results were also reported by Kumargoud *et al*[3].

Table 1: Distribution of the respondents according to their profile (N=150)

S.N.	Variables	Frequency	Percentage (%)
1.	**Age**		
	Young age (below 35 year)	38	25.33
	Middle age (35-50 year)	89	59.33
	Old age (above 50 years)	23	15.33
2.	**Education**		
i.	Low (below 0.27)	33	22.00
ii.	Medium (0.27-2.37)	100	66.66
iii.	High (above 2.37)	17	11.33
2.	**Annual income**		
	Low (below 0.50 lakh)	33	22.00
	Medium (0.51-1.00 lakh)	91	60.67
	High (above 1.00 lakh)	26	17.33
3.	**Land Holding**		
	Marginal (Up to 1.00 ha)	10	06.66
	Small (1.10 to 2 ha)	21	14.00
	Medium (2.1 to 5 ha)	95	63.33
	Large (above 5 ha)	24	16.00
4.	**Family size**		
	Small size (up to 5 members)	31	20.66
	Medium size (6-10 members)	91	60.66
	Large size (above 10 members)	28	18.67
5.	**Live stock status**		
	Low (below 7.24)	28	18.66
	Medium (7.24-17.15)	102	68.00
	High (above 17.15)	20	13.33
6.	**Economic Motivation**		
	Low (below 11.25)	41	27.33
	Medium (11.25-20.85)	87	58.00
	High (above 20.85)	22	14.66
7.	**Attitude towards the use of biogas plant**		
i.	Unfavorable (below 7.45)	23	15.33
ii.	Favorable (7.45-18.15)	105	70.00
iii.	More Favorable (above 18.15)	22	14.66

Impact of adoption of biogas plant on the socio-economic status of biogas users-

The result (Table 2) revealed that the majority (62.00 per cent) of the respondents possessed medium impact of adoption of biogas plant on the socio-economic status, while 21.33 per cent of the respondents possessed high and 16.67 per cent possessed low impact of adoption of biogas plant on the socio-economic status. The result also presented the data regarding mean impact of adoption of biogas plant on the socio-economic status of the respondents was 14.23.

Table 2: Distribution of the respondents according to impact of adoption of biogas plant on the socio-economic status

Impact of adoption of biogas plant on the socio-economic status	Biogas users	Percentage (N=150)
Low (below 9.61)	25	16.67
Medium (9.61-15.95)	93	62.00
High (above 15.95)	32	21.33
Total	150	100.00
Mean	**14.23**	
S.D.	**4.11**	

(Figures in parentheses indicate percentage)
(Significant at 1% level of probability)

Relationship between the profile of biogas users and impact of adoption of biogas plant on socio economic status

In case of education, annual income, family size, livestock position, economic motivation of biogas users, the computed correlation coefficient was found to be significant at 0.01 level of probability. The result (Table 3) revealed that there was a positive relationship between education, annual income, family size, livestock position, economic motivation and impact of adoption of biogas plant on socio economic status of biogas users. In case of age and land holding of biogas users, the computed correlation coefficient was found to be non significant. The results indicated that age and landholding is not an important factor in assessing the impact of adoption dynamics of biogas plant on socio economic status of biogas users. This result are in conformity with the findings of Bajgain and Shakya[1].

Table 3: Relationship between the profile of biogas users and impact of adoption of biogas plant on socio economic status

S.No.	Characteristics of biogas users	Correlation coefficient "r"
1.	Age	0.1039 NS
2.	Education	0.4413**
3.	Annual income	0.3435**
4.	Land holding	0.1764NS
5.	Family size	0.3524**
6.	Livestock position	0.3471**
7.	Knowledge level	0.3241*
8.	Economic motivation	0.4861**
9.	Attitude towards use of biogas plant	0.3351*
10.	Source of information	0.3052*

(*Significant at .05% level of probability) (NS=Non Significant)
(**Significant at .01% level of probability)

CONCLUSION

On the basis of above discussed findings concluded that the majority (62.00 per cent) of the respondents possessed medium impact of adoption of biogas plant on the socio-economic status. The result also presented the data regarding mean impact of adoption of biogas plant on the socio-economic status of the respondents was 14.23. The findings of this investigation will help the extension system to redesign the activities for the transfer of technologies. The result revealed that there was a positive relationship between education, annual income, family size,

livestock position, economic motivation and impact of adoption of biogas plant on socio economic status of biogas users.

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