To Study the Adoption of biogas technology among different category of farmers in Chhattisgarh (India)

Shailendra Kumar

Assistant Professor
Department of Agricultural Engineering
BNPG College Rath, Hamirpur (Uttar Pradesh)

Abstract:
This study focused on evaluating the adoption of biogas plants among the different categories of farmers from the randomly selected districts namely Raipur, Mahasamund, Raigarh and Janjgir-Champa. Data from existing biogas plans, located in four districts used for the estimation of category wise adoption. Total number of existing biogas plants was found 9159. In district Raipur, The percentage of adoption of biogas plants among General, OBC, ST and Sc category was found 5.2, 52.28, 35.28, and 7.08. Similar trends were found in other selected districts. the trend of adoption of biogas technology was found more between the medium and larger owners. It was found in the increasing order from landless (5%), marginal (14 %), small (22 %), medium (28.2 %) and large category of farmers (29.9 %).

Introduction

Biogas is the important source of renewable Energy. Biogas is produced by anaerobic bacteria on the digestion of biomass. Dung is the main component of feeding of biogas plant so it is also known as *Gobar* gas (Rai, G.D. 1997). Its main component is methane. It is free from smoke; reduce carbon emission, so it is a type of green energy. In general, by using biogas, India can produce power of about 17000MW. It is estimated that this power is over 10% of the total electricity in India (Chauhan, 2009, Ranga Nathan, 2010). Majority of the biogas plants in India are individual, household level plants. However, since only comparatively rich villagers have adequate number of cattle, marginal and small farmers, landless labourer and artisans in the villages were found to have rare biogas plants. The common needs of the villagers such as organic fertilizers in large quantities, lighting and water supply cannot be met from individual plants as privately owned individual biogas plants are used mostly for cooking and the sludge for fertilizing the fields (Shailendra Kumar and Neelam Kumar Singh, 2020). In some countries, such as Denmark, co-digestion of high-strength organic waste has previously been a prerequisite for economically viable performance of biogas plants but the limited availability of this type of organic waste has created a setback in the establishment of new plants (Raven and Gregersen, 2007).

With the alarming increase in Indian population, the three major inter connected problems have cropped up to meet out the demands i.e. food, fuel, fertilizer. No doubt numbers of program have been launched to shoot up the agricultural production, and much consideration has been put forth for the installation of fertilizer plants. But the increment is very slow in the same manner efforts have also been made to search the most economic fuel, to be used by general public. In the present era kerosene oil and cooking gas are the main sources of energy in the urban areas, where as in the rural areas mainly firewood and cow dung cakes are prominently used as fuel. The prices of kerosene and firewood have increased to a great extent and hence particularly our farmers are facing a big problem and seeking a substitute of kerosene and firewood to be used

as a fuel in the rural locality. Majority of the biogas plants in India are individual, household level plants. However, since only comparatively rich villagers have adequate number of cattle, marginal and small farmers, landless labourer and artisans in the villages were found to have rare biogas plants. The common needs of the villagers such as organic fertilizers in large quantities, lighting, and water supply cannot be met from individual plants as privately owned individual biogas plants are used mostly for cooking and the sludge for fertilizing the fields (Kumar Shailendra *et. al.*, 2019).

Method and materials

The study was carried out during 2007-08 in Chhattisgarh Plains. A survey was conducted randomly four selected districts of Chhattisgarh (CG). List of Total number of existing biogas plants was taken from different agencies of renewable energy. Total number of existing biogas plants was found 9150. Total 117 Biogas plants were selected. Out of which, 99 working condones and 147 were non-working condition (Shailendra, 2008)

Table 1 Adoption of biogas technology among different category of farmers

S.N.	District	GEN	OBC	ST	SC	Total
1	Raipur	99 (5.2)	996 (52.28)	670 (35.28)	134 (7.05)	1899
2	Mahasamund	230 (5)	3471 (75)	722 (15)	214 (5)	4637
3	Raigarh	80 (4.4)	1296 71.28	370 20.35	72 3.96	1818
4	Janjgir-Champa	43 (5.3)	577 71.67	89 11.06	96 11.93	805
	Total (%)	452 (5)	6340 (69)	1851 (20)	516 (6)	9159

Table 2 Working of biogas plants among the respondents under different category of owners

S.N.	Category	Working	Non-working	Total
1	Land less	3	3	6 (5 %)
2	Marginal	11	6	17 (14.5 %)
3	Small	21	5	26 (22 %)
4	Medium	31	2	33 (28.2 %)
5	Large	33	2	35 (29.9 %)
Total		99	18	117

Adoption of biogas technology among different category of farmers

In order to determine the adoption of biogas plants among different category of farmers, the data of following district as a sample were collected with desired information and mean data are presented in Table 1 .It is clear from the Table 1 that the maximum owners belong to OBC (69 %) followed by ST (20 %) whereas minimum owners belong to SC (6 %) and GEN (5 %). The reason behind this may be social-economic who do not have adequate animals and among the SC the literacy of formers may be one of the reasons. Probably subsidy may also be one of the reasons for least adoption of the biogas, as per farmer's perception, the subsidy was not provided to the GEN category for construction of biogas plant. Similar adoption pattern was also found among the individual blocks

Adoption of biogas technology among different category of owners

It is revealed by Table 2 that the trend of adoption of biogas technology was found more between the medium and larger owners. It was found in the increasing order from landless (5%), marginal (14 %), small (22 %), medium (28.2 %) and large category of farmers (29.9 %).

REFERENCES:

1. Ranga Nathan, 2010. Biogas in India- Current status and future possibilities, http://enzineArticle.com
2. Raven, R.P.J.M., and Gregersen, K.H., 2007.Biogas Plants in Denmark: Successes and setbacks. Renewable Energy and sustainable Energy Reviews. 11;116-132 (2007)
3. Shailendra Kumar, *et. al*., 2019. The pattern of dung feeding and maintenance practices of biogas plants in the Chhattisgarh Plains, India. International journal of agricultural Science and Research (IJASR), Vol. 9, issue 3, pp 221-228.
4. Shailendra Kumar and Neelam Kumar Singh, 2020. ASSOCIATION BETWEEN DUNG FED PER CENT AND BIOGAS GENERATION EFFICIENCY IN CHHATTISGARH PLAINS, INDIA, International Journal of Agricultural Science and Research (IJASR) ISSN (P): 2250-0057; ISSN (E): 2321-0087 Vol. 10, Issue 4, Aug 2020, 103-108.
5. Rai, G.D. 1997. Non-Conventional Energy Sources. Khanna Publishers Pvt. Ltd. New Delhi, India: 311-435.
6. Shailendra kumar, 2008. Techno-economic study of biogas plants in the Chhattisgarh Plains, unpublished M. Tech. Thesis, Deoatment of Farm Machinery and power, IGKV, Raipur, 2008.