

Assessing Cow Dung Availability of Village and Estimating its Energy Potentialities



Zoology

KEYWORDS :

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ABSTRACT

Traditionally cow dung has been used as a fertilisers, though today dung is collected and to produce Biogas. In the present study, we have studied the use of cow dung cake and biogas/gobargas for cooking purpose in 40 families of 4 villages situated at Mauganj Tehsil of Rewa district (M.P.). It is found that sufficient number of families (80%) are using cow dung cake for cooking purpose while only 22% of families are using biogas for cooking purpose. To promote the use of biogas, the requirement of government subsidy has also been suggested

INTRODUCTION

Energy is basic requirement for human life and also it is a critical factor affecting the economic development. The production and consumption of energy places a huge pressure on the environment and public health. Green house gas emissions or dominant (80% of the total emissions). The impact of energy on environment can be seen at five levels: production, processing, transmission, consumption and disposal. Energy production such as hydel, thermal nuclear, biomass is non- conventional has some impact on environment. Energy processing has also its impact on atmosphere such as oil refinery, pump. A large quantity of green house gas (GHG) into the atmosphere. Further the transmission of high voltage line causes some mishaps in the environment.

With the progress of civilisation the demand of energy also increased. Energy consumption rate is considered as an indicator of living standard and development index of a country.

Coal was the source of energy to the early industries. The automatic explosion of coal and drilling of more fossils fuels results to the global warming and climate change. A huge amount of fly ash is collected from the coal based thermal power plants which pollute air, land and water. Similarly, nuclear power plants are harmful to the environment in two ways: one involves the highly radioactive product produced by nuclear fission inside power reactor and the other is unsaved disposal of nuclear waste.

Renewable energy technologies have less environmental impacts than fossil fuels. About half of the world household use solid fuels (biomass and coal) for cooking and heating that produce large amount of air pollution which is probably responsible for 4-5% of the global warden of the diseases.

Rural population of India still depends on the traditional devices for cooking and water heating, which is energy inefficient, leading to excess consumption of local resources. Lack of information about the resources and technologies may be cited as the reason for this situation. This necessitates the understanding of the present energy consumption pattern and exploring locally available alternative energy sources in order to ensure resources sustainability. Cattle dung is predominantly being used in rural area either for preparing farm yard manures by compositing it or directly preparing dung cakes for burning as cooking fuels. Preparation of cakes and burning are highly uneconomically and unhygienic.

In the context, anaerobic digestion of animals' residues not only provides valuable cooking fuels, in the form of biogas and enchants the manure value of the waste but also provides a convenient, safe and aesthetic waste disposal method.

Traditionally cow dung has been used as a fertiliser, though today dung is collected and used to produce biogas. This gas is rich in methane and is used in rural areas of India/Pakistan and elsewhere to provide a renewable and stable source of electricity. According to the international energy agency, bio energy (biogas and biomass) have the potential to meet more than a quarter of world demand for transportation fuels by 2050. [1]

The production of biogas from cow dung in a small scale does not require much expenditure and people. It can be done with a little expenditure as seen in certain houses. In this practice cow dung is deposited regularly in a covered tank called digester (Fig. I & II) where it is kept for 45 days. During this period cow dung undergoes automatic microbial fermentation and as a result of these fermentation methane gas will be released which is then allowed to pass through a pipe attached to the tank (Fig. III) and in tuned utilized for cooking purpose (Fig. IV). [2]



Figure I : pouring of water into digester filled with cowdung



Figure II: Covered tank or digester



Figure III : Pipes for passage of biogas



Figure IV: cooking utilizing biogas from digester

Animal dung is a potentially large biomass resource and drained dung has the same energy content as wood. About 150mt (dry) of cow dung are used for fuels, each year across the globe, 40% of which is in India. But dung is readily recoverable only from confined livestock or in setting were the labour costs associate with gathering dung are modest. The efficiency of conversion of animal residues could be reduce to 60% by digesting anaerobically (to produce biogas).

METHODOLOGY

Study area:-

Mauganj tehsil is at yhe east of the districy rewa, well known for historical places lies between 23° 58' and 25° 12' north altitude and 80° 21' and 81° 23' east longitude in the north eastern part of the Madhya Pradesh. Rewa has 7495 km² of territory and occupies about 2.5% of total geographical area of the state.

Mauganj tehsil of Rewa district is surrounded by the boundaries of Allahabad district (U.P.) on the north, Mirzapur district (U.P.) on the east, Sidhi and shadol (M.P.) on the south and distict Satna on the west. (Fig.V)



Fig. V: - Map of Rewa District

Data Collection:-

In the present study we have performed the survey among the 40 household of 4 villages in the Mauganj Tehsil of Rewa District. We have prepared a questionnaire, for the survey purpose and try to get answer of all 11 question from each family under investigation.

Questionnaire-

1. Name of person.
2. Name of village.
3. Number of family members.
4. How many domestic animals they have?
5. How many animals used for labour?
6. Which fuel is used by them for cooking?
7. For which purpose do they use cow dung?
8. Are they having the facility of gobar gas(biogas) connection?
9. How do they maintain the gobar gas plant?
10. Are they satisfy by using gobar gas?
11. Do they conserve energy by using gobar gas?

RESULT AND DISCUSSION

As discussed under the heading of study area, 40 families of 4 villages in mauganj tehsil of Rewa district has been studied regarding the number of domestic animal they have, use of the cow dung by them, use of LPG by them and the use of cow dung of different energy needs. A bar graph has been sketched showing the % use of cow dung cake, gobar gas, dung as fertilisers, LPG, cow dung cake + fertilisers. (Fig. VI)

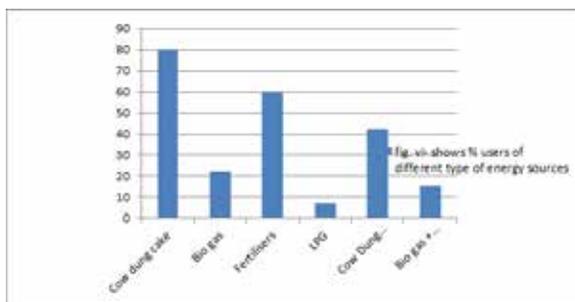


Fig. VI- Shows percentage of users of different type of energy sources

It is observed from the figure that 80% of the families are using cow dung cake for cooking purpose and 22.5% of families are using biogas/ gobargas for cooking purpose. It is found that 60% of families are using cow dung as fertiliser, where as only 42.5% families are using cow dung for fertiliser as well as for cooking purpose. It is also observed from the figure that 15 % of family are using biogas waste as fertiliser.

A kilogram of dung produces 40 l of biogas and a family size biogas plant (2-4 m³) require 50 kg of dung and equal amount of water to produce 2000 l of biogas per day, which would be sufficient for cooking purpose in a family of 6-7 persons.

In present study, it is noted that sufficient number of family are using cow dung cake for cooking purpose but only about 22.5% families are using biogas. Further it has been found that 50% of families can use gobar gas / bio gas plant for cooking purpose as they have sufficient quantity of cow dung. But the manufacturing of biogas plant is also a economic issue, where these family should be supported by government founding.

CONCLUSION

Biogas potential in our study area is not good (less than 23%) analysis revolves that domestic cooking requirement can be met by biogas option in all the four villages under the study area. It is also concluded that more use of cow dung of cake, biogas and fertilizers will prevent the environment from the different type of pollutions.

The use of cow dung cake in the study area for cooking purpose is sufficient (80%). Cow dung cake is being used traditionally for the cooking purpose and requires no funding from government or any other sector. However, manufacturing of biogas (gobar gas) plants requires the government support in all the four villages of our study area. The extended use of biogas/gobar gas will also promote the waste of biogas as the fertilizers which will be useful for saving the dangerous demerits of chemical fertilizers.

References

- [1] Cow dung –A source of green energy, DENMARK-The official website of Denmark
- [2] Dutta Bristi & Abujam, S.K.S., 2012, Biogas from cow dung: its scope and prospect in Shivasagar District: A case study, *Int. J. Innovative Res. Dev.*, Vol. 1, p. 303-313.
- [3] <http://www.teriin.org/renew/tech/biogas>