

Role of Bio Gas Plant for Empowering the Women Communities in Rural Area of India

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Abstract

The economic development of a developing country Like India largely depends on the rural areas. Fuel is considered to be an important instrument for everybody not in urban areas but also in rural areas of the country, like for cooking, for burning, for lighting, for transportation and in many other uses. Most rural households in India depend for more than 80% on traditional biomass fuels like fuel wood, charcoal, animal dung and crop residues (Smith, 2008). The consumption of fuel wood continues to increase as populations increase. Indoor air pollution is one of the biggest problems and consequences of the usage of traditional biomass. The practice of using bio mass lead a major time of the rural women in collecting the biomass and bringing to their houses. The harmful gases are the major cause of health issues in women. The use of Bio gas leads a major turnover in their life as it saves the time and also prevents their health. Using Bio gas can lower their problem by reducing indoor air pollution, reducing the workload for women and children and decreasing the unsustainable use of fuel wood and related deforestation. Many rural houses have cows, buffalo's and other animal for their day to day livelihood.

Keyword: Bio Gas, Alternative Fuel, Rural Women, Clean Fuel,

Introduction

Poverty often means limited access to energy (Cecelski, 2000). Especially in the poorest areas in developing countries, most energy comes from traditional biomass. The use of traditional biomass can be seen as an indicator for extreme poverty and an obstacle to greater prosperity (ENERGIA, 2007). Fuel collection, as well as fuel-management, is often done by women as unpaid family workers (ENERGIA, 2007). To reduce poverty, access to affordable energy services is crucial (ENERGIA, 2007). Levels of empowerment and access to energy are correlated. Parikh (2005) shows this in her research on districts with different levels of access to fuels in the Indian state of Himachal Pradesh. Energy poverty or very limited access to improved energy services is one of the main problems in developing countries. Energy poverty can be defined as 'Absence of sufficient choice in accessing

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adequate, affordable, reliable, clean, high-quality, safe and benign energy services to support economic and human development' (Cecelski, 2004, p. 36).

To overcome the above effects of the traditional fuel in the life of the women, the use of Bio Gas is most effective, less time consuming, easily available, easy handles, safe and healthy means of fuel, easily can be used by rural women for cooking as well in lighting. The use of Bio gas in their house will save their time, which they use to spend in collecting of the fossil fuel. This will help them in utilising their time in making of the own small entrepreneurship which will lead and help in upliftment of the economy of the country.

Major house/ dwelling in the rural area have their own livestock like cows, buffalo, goat, pig, bull, horses etc in their houses which help them to serve their livelihood get the milk for their children, use of some animals in their farming. From the old time the dung of the animal is used in the farms as the manure, which increases the fertility of the farm soil, also known as the organic farming.

Bio Gas

Biogas is the mixture of gases produced by the breakdown of organic matter in the absence of oxygen (anaerobically), primarily consisting of methane and carbon dioxide. Biogas can be produced from raw materials such as agricultural waste, manure, municipal waste, plant material, sewage, green waste or food waste. Biogas is a renewable energy source. In India, it is also known as "Gobar Gas".

Biogas is produced by anaerobic digestion with methanogen or anaerobic organisms, which digest material inside a closed system, or fermentation of biodegradable materials. This closed system is called an anaerobic digester, biodigester or a bioreactor.

Biogas is primarily methane (CH_4) and carbon dioxide (CO_2) and may have small amounts of Hydrogen Sulfide (H_2S), moisture and siloxanes. The gases methane, hydrogen, and carbon monoxide (CO) can be combusted or oxidized with oxygen. This energy release allows biogas to be used as a fuel; it can be used for any heating purpose, such as cooking.

Energy of 1 cubic meter of Biogas is equivalent to: -

- 0.60 litres of kerosene
- 3.5 kg of firewood
- 12.5 kg of cow dung cake
- 1.5 kg of charcoal
- 0.43 kg of LPG
- 4.7 KWh of electricity

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Structure of Bio Gas

The structure of bio gas consists of inlet, the digester, the gas storage and the outlet. The cow dung is mixed with water in 1: 1 ratio and the slurry is poured in the Inlet mouth of the plant and the slurry reaches the digester, then after the fermentation the bio gas is generated and the bio gas is stored in the upper part of the bio gas plant (that is used for the burning purpose) after the bio gas produced the residue of the slurry comes out from the outlet of the plant known as manure.

The generation of bio gas depends on the waste i.e 25 kg of cow dung generate 1 cumtr of bio gas. Similarly, the waste of another animal also produces the bio gas which can be easily used.

Practice of Bio Gas

The bio gas can be easily generated in the house and easily use in the cooking and lighting. Women can install bio gas plant in their house backyard, they can easily construct the bio gas plant depending on the waste or dung of their animal they are having with them. There are many models of bio gas they can use according to their convenience or as per their regional condition.

The models of the bio gas available in India are Denbandhu type, KVIC type, Balloon type, Fibre Reinforced Plastic (FRP), Mild Steel (MS) KVIC based model that are easily available in market or can be constructed by the rural habitants. The daily bio gas required per house is 1 to 2 cumtr per day for cooking their food. The bio gas will help them to get the burning/ cooking fuel free of cost and will also help in saving the environment.

The bio gas plant is also known as Gobar Gas plant in the rural areas and easy to operate and the raw material required is easily available in the rural areas and provides a clean fuel for burning. The use of bio gas helps the women in getting the clean fuel and also saves their time which they can use in other earning.

Suggestion and Recommendations

The suggestions given by the researcher based on the present study are given below:

The Ngo's and government bodies to come forward and educate for the construction of the bio gas plant to the women.

Ngo's and government bodies to fund or provide subsidy to rural household to build bio gas plant.

Ngo's, CSR's and government bodies to build the community bio gas plant.

There should be meeting to educate the operation and maintenance of the bio gas plant to every woman.

There should be the provision of loan by urban banks to the them.

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Conclusion

For the better and safe living of the rural women it is essential to use the clean source of fuel for cooking.

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