

Biogas Technology

A Study of
Community Biogas Plant



R Veena

**BIO-GAS TECHNOLOGY:
A STUDY OF COMMUNITY
BIO-GAS PLANT**

Sponsored by UNICEF

D.R. VEENA

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DR. VEENA

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1

Objectives and Framework of the Study

1. Introduction

Bio-gas as an alternative source of energy has been widely recognised in a number of countries. It is a low cost solution to energy problems particularly in third world countries. This appropriate technological solution got its prominence during the energy crisis. It provides better fuel for heating and cooking. It meets lighting needs in rural communities and provides power for irrigation. It produces highly enriched fertilizer and increases agricultural productivity. It destroys harmful parasites in human and animal waste. It stems the depletion of non-commercial energy sources such as firewood, dung, rice straw, etc. As a result, it eliminates environmental pollution and improves health and sanitation conditions. It provides an opportunity to improve economic conditions through using leisure time for work.

Recognising the vital role of bio-gas meeting the energy needs in rural areas, the Government of India has framed programme for installation of around four lakh individual bio-gas plants during the Sixth Five Year Plan (1981-85). However the extent of success seems to be limited. It is mainly due to the

fact that rural people particularly small and marginal farmers, rural artisans and agricultural labourers do not have (a) enough number of cattle, (b) capital resources, (c) awareness about tangible and intangible benefits, and (d) suitable place to instal plants. Considering these constraints involved in the scheme for installation of family size bio-gas plants, the Government of India has decided to set up community plants in the country.

The scheme of setting up the community bio-gas plant has many advantages : (a) generating gas at a low cost due to distribution of overhead cost among beneficiaries, (b) economical operation as compared to individual plant, (c) to villagers not having suitable and sufficient site to instal small plant, (d) to villagers not having sufficient capital, (e) to villagers not having sufficient number of animals or required quantity of dung. (f) to dispose of slurry more conveniently as compared to individual plants, and (g) to villagers, who do not have individual plants; can enjoy all tangible benefits of community plants. In view of these advantages, a decision of setting up a community bio-gas plant at Khoraj village in Gandhinagar district was taken. It is one of the biggest plants in the country. As usual, this plant has also its own technical and non-technical problems, limitations and constraints in the smooth running. In this context, this study is aimed at obtaining some organised feedback on impact and performance of the plant which ultimately may help to improve and modify the technical design, organisational arrangement, and economic viability of similar bio-gas plants in other parts of the country.

2. Objectives

Objectives of this study are:

1. to monitor technical performance of the plant;
2. to examine performance of the organisational arrangements made to run and maintain the plant;
3. to analyse socio-economic effects of the plant on consumer families;

4. to examine the impact on the village environment and economy;
5. to study economic viability of the plant and cost benefits to the consumer households;
6. to make policy oriented suggestions for improving performance of the bio-gas plant in particular and similar other bio-gas plants in the country in general.

These objectives are examined through using a specific case study of the Community Bio-gas Plant at Khoraj Village, which is one of the biggest plants in the country.

3. Methodology Adopted by ASAG

The nature of this study is such that it is heavily based on quantitative and qualitative information available from the primary and secondary sources. Methods followed in the study are : Desk work, interview and discussion with experts and local people, Primary Survey of Bio-gas users and dung suppliers. Regular visit to the plant and experiments or test in laboratory.

In desk work method, qualitative and quantitative information were collected from the Gujarat Dairy Development Corporation (GDDC), Gujarat Agro-Industries Corporation (GAIC), Directorate of Population Census, Bureau of Economics and Statistics, Gujarat Mineral Development Corporation and Village Panchayat. Statistics and other information deal with socio-economic profiles of Khoraj village, technical and non-technical aspects of the plant, energy consumption pattern and potential sources of energy in Gujarat, development of bio-gas technology in India and Gujarat, etc.

Through using interview methods, Plant Incharge, Plant Operator, Technical Experts, Sarpanch of Khoraj village were contacted to collect information on various technical and non-technical aspects of the plant, problems and constraints involved in low performance of the plant, and overall prospects of the plant in future.