

CMS. **Sustainable Approach on Quality Control of Biogas Plants**. AEPC. June 1998. 84p. BSP Lib Temp No. 19.

Objectives

The study aims at investigating an appropriate, practical, sustainable and long-term strategy for the proper control of biogas system.

Approach and Methodology

To make biogas technology sustainable for long run and acceptable to more people, quality ensurance of the technology is the foremost need and it is a subject of concern to all institutions involved in the biogas sector. Until now, SNV/BSP has been solely responsible to conduct quality control of biogas plants in Nepal. BSP's first and second phase has been completed successfully and in its third phase, there is a programme to commission 100,000 plants from the F/Y 1996/1997 to 2001/2002. In the context of rapidly increasing number of the biogas plants as well as biogas companies, maintenance of the quality control of biogas plants has been a very challenging subject to all concerned.

In above backdrop, Alternative Energy Promotion Centre (APEC) established under Ministry of Science and Technology (MOST) entrusted Consolidated Management Services (CMS) with the responsibility of conducting present study from 21 April to 30 June 1998.

Main Findings

Viewpoints of Biogas Users

The respondents possessed higher number of 8 m³ of plants compared to 6 m³ and 10 m³. There was a tendency among the users to install 8 m³ and 10 m³ plants at the household level. 70 percent of the total selected plants were working "Very satisfactorily" and 20 percent plants were rated as "Working Satisfactorily", while 10 percent were rated as "Not Working Satisfactory".

Out of the total studied plants, about 60 percent have been found facing problems. The most common problems encountered by the users were: Blockage of gas, insufficient gas, leakage of gas, slurry in pipelines and problems related to pipelines fittings and accessories.

Out of the studied households, only 36 percent seemed familiar with the quality control system enforced by BSP, while remaining 64 percent were ignorant about it. 70 percent said that the quality control supervisors did not visit them, while the remaining 30 said that they had paid a visit.

Out of the selected users, 56 percent seem more or less satisfied with the existing services rendered by the biogas companies and other concerned agencies. They said that the governmental organisation namely AEPC which is established to oversee all alternate energy activities would be the most appropriate institution to conduct quality control in the future.

The study revealed that on an average, 93 percent plants installed by the selected companies are functional. The reasons for non-functioning of 7 percent plants are attributed to under-feeding of the plants, lack of knowledge about O&M and neglected after-sales-services.

All users are of the opinion that the company had visited them whenever a complaint is lodged. 60 percent of the respondents said the companies are providing routine visit out of which 50 percent are maintaining their routine visit at the interval of once in a year, while 10 percent provides the services at different time frame as per the convenience of their office. Some users revealed that though company staff visit them on call, but they often linger on to solve the problems.

Viewpoints of Biogas Companies

To date 41 private biogas companies have been established to provide construction services to meet ever-increasing demand for the installation of biogas plants. Out of the selected companies

for this study, almost all responded that the present quality of materials used is satisfactory. About 10 percent of the respondents said that different construction materials exist with varying specifications. About 20 percent of the respondents said that in some cases, the quality of construction deteriorates due to the use of poor quality of construction materials used by the masons.

Asked about the opinion of the companies towards the 73 standards of the BSP, out of 10 companies, 40 percent seem satisfied with these standards and think that these standards cover all the aspects of quality control, while 10 percent appeared totally ignorant about these standards. Another 10 percent think that some more number should be included in the standard. On the other hand, 20 percent think that some of the standards are superfluous and the remaining 20 percent of the respondents are of the opinion that the standards require more number and some of the standards are superfluous.

It can be argued that the companies are suffering due to some of the superfluous standards. For example, digging of two compost pits, which is entirely the responsibility of the users, seems impractical in the present system. Because of mere reluctance or inability of the users to avoid the construction of two compost pits, the penalty is being imposed by BSP upon the company.

60 percent of respondents are of the opinion that AEPC, being a full-fledged government agency, would be appropriate agency for conduction of quality control of biogas plants. However, another 30 percent suggest that BSP should continue to be responsible for this activity. Similarly, remaining 20 percent are of the opinion that this responsibility should be handed over to the company like GGC, which is oldest and leading institution in the field of biogas services.

Viewpoint of Commercial Banks

Agricultural Development Bank of Nepal (ADB/N) has been involved in administrating loan and subsidies in biogas sector since 1975. From 1994 onwards, Nepal Bank Limited (NBL) and Rastriya Banijya Bank (RBB) have also started financing the biogas sector. Until now, the latter two banks (NBL and RBB) have not been found interested in the promotional activities of biogas plants except for providing loan. On the other hand, ADB/N, as the main shareholder of GGC, has also been involved in the promotional activities mainly in information dissemination and training in addition to channelling loan and subsidies.

Commercial banks feel comfortable, as repayment of loan in biogas is high compared to other loans. Biogas loan ranks as second good loan after tea and coffee. However, the lengthy and cumbersome procedure adopted by the banks in loan approval needs to be simplified.

At present, the users are attracted more by the amount subsidy provided by the government rather than utility of plant. Many farmers with high economic status also take loan with the understanding that it is easier to get subsidy than in the case when they put their own money for a plant construction.

Viewpoints of Quality Control and Supervisors

Quality Control Supervisors of SNV/BSP are the key manpower to conduct the overall supervision of installed plants. Their contribution in maintaining the quality of installed biogas plants is highly commendable. There are altogether eleven Quality Control Supervisors assigned by SNV/BSP. Thus, to gather necessary information for this study, out of 11 quality control supervisors, three were interviewed in agreement with BSP.

The Quality Control Supervisors think that the existing method is very effective. They stated that the quality control measure fixed by BSP is practical, realistic and sustainable and covers almost all the aspects of quality control. They are also confident that with the help of resources and equipment provided to them, the existing number would be enough to conduct supervision till the next year but they also acknowledge the fact that with the increased number of companies and plants, number of the Quality Control Supervisors should be increased in the future to cope with

the targeted number of biogas plants stipulated in the third phase of BSP's activities (i.e. 100,000 plants to be commissioned by 2002). They further added that to collect a more realistic and practical information, sample size for survey needs to be increased.

The most common defaults on the installed biogas plants as pointed out by the quality control supervisors are: Reluctance in digging compost pit, top filling on dome, water drain pit, improper pipeline fitting, use of larger size of gravel, appliances of low standards, under feeding of the plant and leakage in the pipelines. The main basis for fixing penalty to a biogas company is "performance factor" which includes: average number of defaults, "Production Factor", percentage of feeding and average penalty amount.

All the supervisors, however, were found collectively expecting regular training, observation and study tour and participation in workshops in order to enhance their technical know-how and to boost up their morale.

Viewpoints of Knowledge Persons

Regarding the respondents' view on the standards fixed by the SNV/BSP, 30 percent were found satisfied with the norms and specifications adopted by SNV/BSP as it has followed engineering standards suited to indigenous technology. 15 percent said did not answer the question, while rest 5 percent found unsatisfied with the standards fixed by SNV/BSP. According to them, some components of the programme being costly and due to the penalty amount set forth the defaulter plants are too high and making even the second compost pit is an unnecessary burden to the users.

43 percent of the interviewed respondents were found supporting the penalty system, while 43 percent of them did not support the system and the remaining 14 percent were of the opinion that penalty and award is one of the tools of the improving work quality and its has helped improve the quality of plants as there is not other effective system and responsible agency established for the quality control of biogas plant. According to the views of the respondents who did not support the existing penalty system, it is not logical that BSP should reimburse the penalty money to the company. Regarding the suggestion for better alternative against the existing penalty system, it has been suggested by them that companies having better performance should be provided more opportunity and BSP, AEPC and NBPG as well as the companies should work jointly to inspect the plant.