

Community Biogas Plants: Economic Evaluation

D.C. Sah

The fuel needs in rural India are exclusively met by catching solar energy through wood production. Where wood is a scarce commodity, they are met by crop residuals and animal waste.¹ In order to bridge the gap created by scarcity of wood and industrial utilisation of agricultural by-products the relevant question is to what extent biogas can be relied on as an alternative source of energy. Related to this question are issues like choice and transfer of technology, economic feasibility, and organisational capabilities available within rural India for biogas. The objective of this paper is to answer some of these questions.

BIOGAS TECHNOLOGY: A REVIEW

In the recent past a number of studies have examined technological² and economic aspects³ of biogas plants. A review of selected studies is presented below.

The production of methane from animal dung is based on bacterial action. The anaerobic fermentation of cowdung produces methane (55 to 60 per cent by volume), carbondioxide (30 to 35 per cent) hydrogen (10 per cent), and slurry containing rich manure in the form of nitrogen and phosphorous. The fermentation is a slow process and depends mainly upon the temperature inside the digester. As temperature increases from 10°C to 60°C the fermentation time goes down.

The economics of investment in biogas plant depends on capital and operational cost of the plant on the one hand, and valuation of gas and manure produced on the other. Apart from tangible benefits, biogas plant also has intangible benefits like smokeless cooking and improvement in the environment, more leisure time to housewives, and income and employment generated on site and by collection of gobar from village streets.

The findings by KVIC (1975) that all sizes of biogas plants are economically viable investments to the owners created an optimism for rapid adoption of biogas technology in rural India. Moulik and Srivastava (1975) have tried to explain the reasons behind the slow adoption of biogas technology by the farming community. Their findings suggest