

## Implementing Biogas Technology in Rural Areas of Limpopo: Analysis of Gawula, Mopani District in South Africa

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**Abstract :** Access to energy is crucial in poverty alleviation, economic growth, education, and agricultural improvement. The best renewable energy source is one which is locally available, affordable, and can easily be used and managed by local communities. The usage of renewable energy technology has the potential to alleviate many of the current problems facing rural areas. To address energy poverty, biogas technology has become an important part of resolving such. This study, therefore, examines the performance of digesters in Gawula village; it also identifies the contributing factors to the adoption and use of the technology. Data was collected using an open-ended questionnaire from biogas users. To evaluate the performance of the digesters, a data envelopment analysis (DEA) non-parametric technique was used, and to identify key factors affecting adoption, a logit model was applied. The reviewed critical barriers to biogas development in the area seem to be a poor institutional framework, poor infrastructure, a lack of technical support, user training on maintenance and operation, and as such, the implemented plants have failed to make the desired impact. Thus most digesters were abandoned. To create awareness amongst rural communities, government involvement is key, and there is a need for national programs. Biogas technology does what few other renewable energy technologies do, which is to integrate waste management and energy. This creates a substantial opportunity for biogas generation and penetration. That is, a promising pathway towards achieving sustainable development through biogas technology.

**Keywords :** domestic biogas technology, economic, sustainable, social, rural development

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