Fixed Dome Biogas Plant



Why to choose this solution?
Biogas reduces the need for directly burning solid biomass fuels like firewood and charcoal and burns cleanly without producing smoke or ash. Biogas systems help make waste products productive, leading to improved health, better sanitation, and lower impact on the environment. Gases that are burned completely as fuel are not emitted into the atmosphere as GHGs.

Savings per day or production:
It saves money that could have been used to pay for commercial sources of energy or disposal of waste. Demand for firewood or charcoal and the workloads of women and children, are reduced by about 20% in households with biogas. Washing pots become an easier task in the absence of smoke and soot. Crop productivity improve due to use of slurry that remains after feedstock digestion.

Cost in money and in own time to construct:
It must be purchased due to the expertise and some materials required for construction. A biogas system of 9 m3 costs about TSh 2.5 to 3 million (USD 1080 to 1300). One mason takes five to seven days to construct a biogas system of 9 m3.

Lifetime:
About 20 years, if well operated and managed.

Maintenance needed:
Fermentation process needs a continuous supply of feedstock and water.

Resources needed in use:
Animal dung.

Problems and limits:
Capital investment for construction of biogas system is high making it un-affordable to low income families. The continuous supply of feed-stock and water to the biogas plant is a tedious work for the biogas owners.

Where and how can you get it or make it?

Skills needed to produce, install. maintenance, use:
Construction and installation of infrastructure to deliver gas needs a skilled mason and plumber, operation and

maintenance needs a short training.

How to use it:
https://www.youtube.com/watch?v=XcBOy1R363c

How to maintain it:
https://www.youtube.com/watch?v=OYwUx5eOYEw

Climate effect (if any):
Biogas is a renewable source of energy and an efficient method for the conversion of biomass to energy. Renewable energies have always been identified as a prime source of clean energies that emit little or no net GHGs into the atmosphere. Biogas provides a means of mitigation to reduce the sources or enhance the sinks of greenhouse gases. One biogas installation saves an average of 8.5 tonnes of CO2 and 4,667 kg of wood per year.

Where it is used and how many users are there?
Used in Tanzania by more than 5,000 households and 1,000 institutions every day.

Why is it successful?
Successful because it provides cleaner energy for cooking with low operation costs.

If you can make it, a short description, typical problems, materials needed:
Not relevant, needs a skilled mason to make it.

How to make it (if possible):
https://www.youtube.com/watch?v=PmBx5Zo8KZo

How is it delivered and by whom?
Through support of development partners, CSOs played major roles in awareness-raising, capacity building of local masons, technology dissemination, and advocacy. They also facilitated linkages of masons and potential consumers. Capital investment for a good number of biogas systems constructed initially was supported by grants. Ease of availability of masons has also contributed to the success.

Successful financial model
Subsidies were applied in most of the plants constructed under development projects. The simple payback period of a biogas installation varies between 2.5 and 9.5 years, depending on whether purchased charcoal or firewood, largely collected for free, is substituted.

What policies and strategies helped the success?
Biogas was introduced in Tanzania beginning in 1975. From 2009 to 2012, the Tanzania Domestic Biogas programme, coordinated by the government entity CAMARTEC, also contributed to initial efforts. After the program ended, further development was taken over by the private sector (the trained masons) and CSOs.

More info:
http://www.bibalex.org/Search4Dev/files/338190/171749.pdf

Sources:
https://www.tatedo.or.tz

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Case from Catalogue of Local Sustainable Solutions in East Africa. Read more and see partners at localsolutions.inforse.org