



Tropentag, October 5-7, 2011, Bonn

“Development on the margin”

Biogas as Business — Biogas Transport Technology and Economic Concept for Developing Countries

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Abstract

Biogas dissemination in Africa addresses the aim of providing poor rural households with an affordable source of energy. The chosen approach, as defined in the countries' National Biogas Programs (NBP), is a highly subsidy-driven implementation of domestic biogas plants. Progress reports of several countries show a variety of discrepancies between goals and actual achievements. The currently implemented Ethiopian NBP is designed to provide 14.000 out of 11.2 million households in 4 selected regions within a 5 year period until 2013 with domestic biogas plants. Until December 2010 a number of 860 digesters had been installed. Major constraints of the NBPs are related to lacking financial attractiveness and to the conditions to be met by households: possession of at least 3–4 cattle to provide dung as input substrate, 350 to above 500 € as contribution to construction costs, water in reasonable distance. Thus, the majority of households is initially excluded from the programs by default.

The aim of this study is to evaluate the potential of an alternative biogas dissemination concept. It is designed as business approach to make biogas more quickly accessible for a larger number of people. A mobile biogas storage container has been developed to facilitate the sale of biogas from a central, privately owned biogas plant. The container is filled with biogas at the digester with up to 10 kPa by pressure equalisation between plant and container. It can easily be carried (3–4 kg) to the households and there connected to different appliances. Because all surrounding farmers can contribute to the biogas production by selling substrate to the plant owner, the full potential of biogas in a certain area can be exploited. The system provides easy and flexible access to biogas for theoretically every household with saving on training every user in biogas production. First field tests in rural Ethiopia approved the technology to be functional, easily accepted and understood by farmers. The further aim of this study is to determine economic data of the system “biogas as business” to be able to compile business plans for private investors und thus make biogas dissemination independent from subsidies.

Keywords: Biogas storage, biogas transport, business concept, developing countries