

Case Study

Biogas for Community Electricity / Cooking

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Time of interview: 60 minutes

Recorded Interview

Dr. Andreas Namwoonde, Research Scientist at SANUMARC, Henties Bay

No restrictions on the use of the information

The Biofuel/energy supply chain.

The concept of the case study presented has a different structure from the biofuel supply chain referred in the main questionnaire. The project is being done under a research and development perspective. Although considering the overview of the supply chain, the production, storage and use of the energy occurs all in the same structure and space.

The kind of technology used is a biodigester tank that receives the biomass, provided by one or more houses. As it fills up and stores the biomass, it starts to produce gas (mainly methane) and through a valve system the gas is sent back to the house(s). The gas is stored for a very small period, up to three days. It is used mainly for cooking, but it can be used also for lighting.

The target market of this project is the poor communities, where it is difficult to have access to energy due to the costs of it. A major project is under research at University of Namibia, engineering department where possibilities for commercial use are being evaluated.

The case study.

The project of Biogas for Community, has the objective of allowing poor people to have access to energy, mainly for cooking. It was initiated in 2008, under a research program from UNDP under supervision of UNAM/SANUMARC. It were installed two bio-digester in two locations in the informal settlement in Henties Bay. The bigger unit only worked during the installation period and was connect to three houses, the smell of the gas produced was not sustained by the families. It was also observed that in this unit the shower waters were connect to it, making even more difficult to produce gas. The second unit worked until 2010, while the lady that was managing the bio-digester was alive. After she died, there was no one that kept it running. While the bio-digester was being operated it was possible to use the gas for plus minus three hours, mainly for cooking. This family was no longer buying electricity for cooking, only for lighting.

At the present, Dr. Andreas Namwoonde is trying to re-habilitated the units, but due to the properties of the biomass stored at the biodigesters is not being possible operate them. The contents of the biomass vary between sewage from bathrooms (not including shower waters) and food leftover. Furthermore with the stagnation period of the project, from 2010 until late 2011, the units were filled with all sort of waste.

The research that is being done is to optimised the removal of the hydrogen sulphide that characterises the smell of the gas. Also combinations of biomass that improve the quality of the gas produced are being evaluated. The location of future biodigesters is also being addressed in this research, since the climate conditions in Namibia changes from the coastal humidity conditions to the dry desert and the flooded areas in the North. For the research purpose of optimising the biodigester, it was establish a third unit at SANUMARC and a major unit at UNAM engineering department that is feeding gas into certain areas of the Campus.

Drivers.

The researcher interviewed is not aware of how the project did started and what funds were used. It seems that it was UNDP fund under supervision of UNAM/SANUMARC that allowed the implementation of the project. Once the project was implemented it was the responsibility of the community to maintain the structure.

The technology implemented was brought from Ghana. One member of the community was sent to Ghana to learn how to build the biodigester. Once he got the training, he was in charge to give local training to the rest of the community and help with the installation and maintenance of the project.

To allow the progress of the project, efforts in obtaining Government and/or University funds are being carried. However the outcome of this effort is not satisfactory, but the research is still being developed with the few funds that can be granted.

Concerning the environmental footprint, the leading researcher is aware of the benefits and the reduction on environment impacts that the collection of the waste will have. The project has several impacts such as: the methane is confined into a reservoir (not being release to the atmosphere), the gas released is mainly CO₂ after the combustion in the cooking process; it also has a control in the management of waste and it gives value to what is considered waste. With the appropriate use of the biodigester the solid material that is produce can be applied into the soil has organic fertiliser. The environmental concern of the other stakeholders are not cleared, since there are positive benefits for the local community and to the municipality but for some reason the project from their side is not being pushed forward.

Support.

The support to establish the project was provided by UNDP fund under supervision of UNAM/SANUMARC. It is known that the training and technology was provide in Ghana, not being possible to know what organisation was involved.

At the present UNAM, SANUMARC are involved in supporting the research and developing the project. Research in removing the hydrogen sulphide from the produce gas is being done, with the goal of providing a gas with no smell in a cheap and effective way. Efforts in getting funds are being made to allow future developments on research (implement in several regions of Namibia the local develop biodigester; determine the qualities and quantities of biomass; as well research in boosting the digestion of the units are being explore).

Dr. A. Namwoonde is aware that the local municipality was involved in the setup of the biodigester units, but up to which degree he is not aware. At present he is facing some difficulties in re-starting the smaller unit due to accumulation of several wastes. Contacts were made with the Henties Bay Municipality, but for some miscommunication problem the Municipality is not collaborating in the removal of the waste materials.

Jobs.

The project is not developed to create jobs but to help reduce poverty in local communities. Punctual jobs are created during the construction and implementation of the biodigester system. There is very little long term job creation, only at R&D level could exist space to the creation of jobs related to the project implementation.

Business targets and wealth creation.

After late 2011 it was possible to design local adapted biodigesters. During the year of 2012, at SANUMARC was possible to establish a third unit to develop the system designed and promote the research in optimisation of several parameters, as kind of bacteria to boost digestion, temperature effect on the gas, re-utilisation of solid waste for fertilisation.

Future plans will depend on funds availability, but intentions are to implement the biodigester in several locations where meteorological conditions are different and identified faults and positive effects of the new design. Optimise the biomass and bacteria used to best production of gas.

Training.

It is recognise that is required minimum training from the community where the units are installed. A brief description on how to operate and maintain the system; explanation on what type of biomass can and should be loaded to the biodigester and simple description on how to operate the gas reservoir to allow a proper usage of the gas. This end-user training requirements will take a couple of hours.

For the installation of the units un-specific labour can do the work, under the supervision of technical operator. The technical operator, in 2008 was sent to Ghana to receive instruction on how to assemble and use the bio-digester. At the present with the project being done at SANUMARC, the local researcher will be able to provide the requirement training to install, operate and maintain the units. Further training might be achieved in the R&D field with further students joining the project.

Local community stakeholder groups.

The stakeholders involved are:

SANUMARC - Sam Nujoma Marine & Coastal Resources Research Centre has the research center to adapt the existent technology to local conditions, the centre is involved in this research since 2008-2010 and was re-establish from late 2011 until present.

Henties Bay Municipality - The degree of engagement of the Municipality is not clear. It is known that in 2008 they were approached to facilitate the communication with the informal settlement. At present the communication is not occurring concisely.

Informal Settlement Community - The Informal Settlement Community was engaged at the time of discussion of the location for the biodigester units. The allocation process for the biodigester is not known. The small unit was given to a lady that is not alive anymore and the larger unit was settled at the day care centre with the gas being channelled to three neighbour houses. At the present the engagement with the community will only occur once the biodigester built at SANUMARC is optimised for the local conditions.

Impact on agricultural practice

The impact on agricultural practice that this project may have in the future, is the local production of organic fertilisers that can be used in agricultural land. The research done since late 2011 used the solid waste in gardens of the institute, but further research is planned to be done.

Future growth plans and recommendations.

The plans for the future of this project are to re-establish the two units that are installed in informal settlement.

Improve the research done in reducing the hydrogen sulphide gas in a cheap and effective way.

Implement several local adapted biodigester in different regions of Namibia.

Improve the production of gas on the biodigester with the use of specific bacteria and a proper ratio of different types of biomass.

As a research driven project, the optimisation of the several factors of the bio-digester would always be under research.