

Biogas in Ethiopia

From Skepticism to Enthusiasm

A step towards a national biogas program in Ethiopia

A national biogas program in Ethiopia contributes to improved living conditions for rural households, creates employment opportunities, and reduces the dependency on biomass as a cooking fuel thereby curtailing environmental degradation. The improved service delivery through well anchored public private partnership is one of its pillars to achieve the goal of the program. In the process towards the formulation of an implementation document for a national biogas program, SNV advised on the concept for mass dissemination of domestic biogas, created awareness and empowerment amongst stakeholders and established linkages between national and regional government organizations, NGOs, micro finance institutions and the private sector and linked Ethiopian biogas experts to a biogas knowledge network. Within less than one year an implementation plan has been developed endorsed by multiple national and regional stakeholders.

Rural Energy in Ethiopia

The Ethiopian rural development effort is challenged by deep-rooted poverty and food insecurity with deteriorating resource base exacerbated by downward spiraling relationship between agricultural production, energy use, and resource management including land, water, livestock, and forestry resources. The scarcity of fuel wood has led to an increased utilization of dung and agri-residues for cooking, which could otherwise have been used to enhance the nutrient status and texture of the soil and contribute positively to agricultural production. Access to modern energy is a key element in rural development. However, despite all attention given to energy issues in Ethiopia in the past, rural communities continue to be deprived of basic energy services. Modern forms of energy are simply not available in rural areas while traditional sources are rapidly being depleted, thereby deepening the rural energy crisis. For substantial and sustainable development to take place within the rural areas there is a need to provide energy services and systems that allow consumers to have a range of fuels and technologies that can support their particular energy needs. However such services and systems involve a complex array of issues, stakeholders, and demands.



Courtesy: Dung for burning (Chachat, ETHIOPIA)

Institutional Arrangement

The EREDPC was established in 2002 with the objective of creating an enabling environment for the development and promotion of rural energy resources and technologies in Ethiopia. It is thus responsible among others, to identify the energy resources suitable for the rural areas; study the energy demand, supply and consumption patterns of the rural areas; evaluate the social, economic and environmental impacts of using various energy sources and technologies; raise the awareness of the rural community; and provide trainings concerning the production, distribution, utilization and

conservation of energy. It is a federal institution represented in the government by the Ministry of Mines and Energy.

To accomplish its broad tasks, EREDPC is organized in two technical departments, namely, The Energy Technology Studies and the Socioeconomics & Popularization departments. Currently, it has a total of about 40 staff in the two technical departments. Biogas is one of the sub teams in the team organized under biomass at the Energy Technology Studies Department.

EREDPC and implementation experience of rural energy technologies

Apart from the numerous studies it conducted on different types of renewable technologies so far, the major experience of EREDPC in the implementation of energy technologies is the development and promotion of the MIRTE wood saving stove for cooking Injera together with GTZ. The Rural Electrification Fund (REF) established in 2003 and financed by the WB is also another project that is currently under implementation. Concerning biogas, EREDPC was engaged in a project-based stand-alone approach with full involvement of its staff in the training, promotion, and construction of the biogas plants by financing almost 90 % of the cost. Although there were other actors (e.g. Mekane Yesus, World Vision, Biofarm, etc.) engaged in biogas digester construction, EREDPC was not in control to regulate their activities.

Status of biogas dissemination in Ethiopia

Biogas is one of the technologies that is included in the broad mandates of the EREDPC. The technology was introduced in Ethiopia as early as 1979, when the first batch type digester was constructed at Ambo Agricultural College. During the last two and half decades around 1000 biogas plants were constructed in various parts of the country ranging in size from 2.5 m³ to 200 m³ in households, community, and governmental institutions. Many of the biogas plants were built by the government mainly for demonstration purposes without follow-up structure in place, variations in design, and the absence of a standardized biogas technology. Recently, World Vision Ethiopia introduced biogas under its Appropriate Agricultural Technology Promotion Initiative (AATPI) and supported the construction of some 150 plants. However, the technology didn't spread as it was expected. Presently, approximately 40 % of the plants are not operational due to lack of effective management, follow up, technical problems, loss of interest, reduced animal holdings, evacuation of ownership, and water problems etc. Consequently, domestic biogas does not have a favorite reputation in Ethiopia and there is wide spread skepticism amongst biogas experts to unleash the potential for biogas in Ethiopia that could potentially be beneficial to hundred of thousands households.

SNV and the Ethiopian National Biogas Program (NBP)

Biogas programs have proved successful in Asia where topographic, demographic, socio-economic structures are not far different from Ethiopia. A successful biogas development and dissemination program in Ethiopian context requires the proper participation and commitment of a sizable number of

Domestic biogas is generated by utilizing the waste stream of livestock at rural farming households. Dung, mixed with water is daily inserted in a biogas plant of 4, 6, 8 or 10 cum where biogas is formed, containing methane that can be used for operating a cooking stove or a biogas lamp. The digested slurry that leaves the biogas plant is used as an organic fertilizer.

The development of a biogas sector in Ethiopia offers many opportunities to alleviate poverty. Households with at least four cattle and access to water can install a biogas plant, reducing the daily workload by mainly women with 2-3 hours, creating access to clean energy, reduced indoor air pollution, reducing energy related expenditures, utilization of cow dung as a bio fertilizer resulting in improved yields and environmental protection.

stakeholders whose perspectives and interests are diverse. This requires a rigorous design and institutional arrangement of the program with well defined roles and responsibilities of all stakeholders. It is against this background that SNV, with its experience in supporting the setting up of domestic biogas programs in a number of Asian countries, helped to conduct a feasibility study for starting up a NBP for Ethiopia. The feasibility study concluded positively and resulted in a formal partnership between EREDPC and SNV/Ethiopia in 2007 to develop a program implementation document (PID).

Goal of the National Biogas Program

The aim of the NBP is to build on and further develop existing institutions and organizations for the continued and sustained viability of the biogas sector in Ethiopia. SNV, as part of its capacity development activities to support the program, aims to facilitate the establishment of a public private partnership that ensures the structural involvement of relevant government institutions, (I)NGOs, financial institutions, and private sector to disseminate domestic biogas in the country. SNV's experience in Asia in this regard was the most successful. If there will be a structural and long term involvement of these parties, it is SNV's firm belief that biogas can supply a significant proportion of the energy needs and other associated benefits to the rural population in Ethiopia.

SNV Approach

The jointly established PID team started its activity in February 2007 by presenting the working methodology to EREDPC and SNV. Upon approval of the working methodology, the team conducted a thorough stakeholders' consultation first in the regions- Tigray, Amhara, Oromia, and SNNP- and later at the federal level with the aim to create awareness on the concept for mass dissemination of domestic biogas, identify ongoing initiatives related to biogas, roles & responsibilities, and willingness of stakeholders to participate in the NBP following a model of dissemination that was successful in Asia. The stakeholders' consultation was concluded by a national stakeholders meeting giving the PID team with an input on institutional and financial arrangements to finalize the implementation document. After the completion of the PID in September 2007, the awareness creation was also extended to include the staff of the coordinating regional Mines and Energy agencies, the two prioritized woreda cabinet members in each of the four regions, and the potential farmers of the three kebeles selected from each woreda. Final approval of the PID by the Government of Ethiopia is on progress.



Biogas Advisors in Action

Results

More than 1317 representatives of Government, (I) NGOs, private constructors and construction cooperatives, development banks, microfinance institutions, and farmers gained awareness on the concept, features, and functions required for a NBP. Additionally, stakeholders got a chance to provide input that they consider important for

the development of the NBP. The establishment of a NBP that ensures the structural involvement of stakeholders in a public private partnership with clear functions was unanimously accepted. Moreover a consensus was reached to establish a semi-autonomous Biogas Program Coordination Office for the day to day management of the NBP. EREDPC and the regional Mines & Energy Agencies were identified as responsible bodies to coordinate the overall program at the national and regional levels. More than 734 farmers were registered to invest in biogas when the program is ready to be implemented.

Moments of success

- Despite the initial reservations to an in depth stakeholders' consultation EREDPC provided full support by appointing a full time biogas expert to work jointly with the SNV biogas advisors. Throughout the formulation process EREDPC showed full commitment to the PID team.
- Depicting the functions needed in the national domestic biogas during the stakeholders' consultation made EREDPC and other actors to visualize their roles in the program. Accordingly, the most appropriate institutional arrangement and the delivery channels designed for domestic biogas through federal and regional governments with active involvement of NGOs, micro finance institutions and private sector were unanimously accepted by all stakeholders.
- Stakeholders accepted the coordination role of EREDPC at the federal level and MEAs at regional level in the program.
- Regional governments included biogas in their regular planning and committed budget for 2007/2008 F.Y.
- Prior to the stakeholders' consultation, MFIs considered biogas as a new product and a high risk intervention. After the consultation meeting the interviewee ensured the PID team that micro credit can be offered at low risk interest rates because of the transparency and accountability embedded in the design of the program.
- Based on the draft PID and outcome of the national stakeholders' workshop a NGO set aside resources to promote domestic biogas and a formal agreement was signed for cooperation with EREDPC and SNV.

Lessons Learnt

- Have a framework (concept) before engaging with a client or constellation of clients i.e. better to start by questioning what than how?
- Involving relevant stakeholders' in a dialogue can create understanding and need to work in partnership
- If targets are to be met in the most inclusive, efficient, cost-effective way, it is essential to create awareness for all stakeholders at all levels of the administrative structure.

Recommendations

- In the context of *Biogas for a better live: An African Initiative* is expected that other African countries will, based on the outcome of a feasibility study, pursue the establishment of a national biogas program. For the development of a program implementation document it is recommended to identify the roles and responsibilities of potential stakeholders where possible in partnership with the expected lead organization. It is further recommended that sufficient human and financial resources are mobilized to allow for an in-depth stakeholders' consultation. It is estimated that a minimum of 320 advisory days are required to cover a one year period including

preparations, stakeholder consultation, report writing, securing resources and seeking final government approval.

- The involvement of the public sector in the regulatory aspects of any development program is quite crucial to ensure sustainability
- If development programs are required to succeed it is important to address stakeholders' concerns right from the beginning

Resources

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SNV is dedicated to a society where all people enjoy the freedom to pursue their own sustainable development. Our advisors contribute to this by strengthening the capacity of local organisations.

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