

Institutional arrangements
for the
Uganda Domestic Biogas Programme

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1 Introduction and background

In the framework of the “Biogas for Better Life - an African Initiative”, Ugandan stakeholders in domestic biogas promotion aim to facilitate the preparation and implementation of a large-scale domestic biogas programme in Uganda.

Referring to the history of former biogas initiatives in Uganda, the present increasing need for renewable and environmental friendly energy sources and the mainly positive outcome of the feasibility study conducted by Winrock International of May the 29th of 2007 (identifying a technical potential for domestic biogas in Uganda in excess of 200,000 installations), Ugandan stakeholders aim to facilitate:

1. The selection of an appropriate design for domestic biogas installations to be supported by the proposed programme;
2. The creation of a conducive institutional arrangement for the proposed biogas programme, including the selection of an appropriate and accepted “National Implementing Agency” (NIA) to initiate and coordinate all programme functions, and;
3. The formulation of a detailed Programme Implementation Document (P.I.D) for the proposed programme, outlining character and scope of functions and activities, actor constellation and budget for the period 2009 – 2012.

In December 2008, the Directorate General for International Cooperation (DGIS) approved the proposal for the African Biogas Partnership Programme (ABPP). In this programme, DGIS, in a public private partnership with two development NGOs, HIVOS and SNV, aim to support the implementation of the National Biogas Programmes in six African countries through funding (DGIS); fund management and overall coordination (HIVOS), and; capacity building and knowledge management (SNV). Uganda is among the six selected countries.

1.1 The Hivos - SNV joint mission

HIVOS and SNV undertook a joint mission to Uganda from 2nd to 6th March 2009. The main objectives of this mission were threefold:

1. Explain the objectives, scope and operation of the ABPP to stakeholders;
2. Make an inventory of the current situation in the country viz a viz major stakeholders, their activities and priorities viz a viz the proposed biogas programme, and;
3. Arrange for proper and accepted programme hosting and ownership.

The mission had meetings with all the major stakeholders in the programme. Addressing objective number 3, following -among others- a list of criteria for the National Implementing Agency, the mission concluded that “Heifer Uganda will be further explored as the most promising option¹”, and a paper for discussion on the institutional arrangements was distributed.

1.2 The Institutional Arrangement mission

The joint mission acknowledged that the choices made in the distributed IA-discussion paper were based on a mix of “outsider ignorance” regarding local conditions that may not everywhere be off-set by their “outsider fresh view”. Hence, to arrive at a well balanced set-up, a second visit to Uganda was foreseen to discuss the proposal.

The main objective of this mission was to finalize the institutional arrangements for the proposed domestic biogas programme in Uganda along the lines as set out during the mission and presented in the discussion paper. More specifically, the assignment undertook the following activities²:

¹ Trip report Hivos – SNV mission to Uganda

² For details please refer to the brief mission report

1. Fine-tune the criteria for selection of a NIA, taking into account the criteria mentioned on the stakeholder meeting of 05-03-2009.
2. Consult all major stakeholders on the discussion paper for the institutional arrangement for a national biogas programme in Uganda.
3. Compose the actor – activity matrix for the programme, attributing roles and responsibilities as detailed as possible.
4. Select the NIA for the programme, and assess short and medium assistance required to start-up the biogas programme swiftly.
5. Address the stakeholders in a workshop, explaining the institutional arrangements, including the NIA selection.

2. Objective of the proposed Uganda Domestic Biogas Programme

The overall objective of proposed national programme on domestic biogas is to further develop and disseminate domestic biogas in rural and semi-urban areas offering the Ugandan population the benefits derived from the use of clean biogas for cooking and lighting and using the bio-slurry to increase agricultural yields with the ultimate goal to establish a sustainable and commercial biogas sector in Uganda.

The tentative specific objectives contributing to its overall objectives are:

- To develop a commercially viable, market oriented biogas industry in Uganda;
- To further strengthen involved institutions for sustainable development of the biogas sector;
- To provide low cost, clean and environmental friendly energy for cooking and lighting and reduce respiratory and eye diseases caused by indoor pollution from smoke inherent to traditional cooking;
- To improve the sanitary conditions of farm yards as well as the larger environment;
- To reduce the workload of (mainly) women and children related to fuel wood collection and cooking;
- To create rural employment related local biogas enterprises providing biogas services to households;
- To improve soil nutrition and texture –and therewith agricultural yield- through the application of organic bio-slurry, and;
- To reap the environmental gains based in forest conservation reducing the use of firewood and charcoal and reduced Green House Gas emissions (GHG) resulting from the use of biogas.

3 Description of the target group

Central in a commercially viable approach is the household and its demands in view of agriculture, health and sanitation, environment and energy services. Characteristics of a prospective biogas household thus would include:

- farming households, having 2 (zero-grazed) to 10 cattle³ or 8 to 40 pigs (or a combination thereof);
- real demand for alternative domestic energy sources, whereby it is helpful when the household already (partially) uses commercial energy⁴;
- opportunities for meaningful application / marketing of bio-slurry;
- organized in dairy collection, micro-credit, women or rural development groups.

The prime characteristic, households having at least 2 heads of cattle or 8 pigs, indicates that the technology will not directly reach the very poor households. At best, domestic biogas will indirectly improve the livelihood of the very poor by improving access to non-commercial domestic fuel, general improvement of the community's sanitary and environmental situation and generation of employment (construction and after sales services).

³ For semi-intensive cattle holding, households should roughly have double the heads of cattle.

⁴ Commercial domestic energy: LPG, kerosene, but also purchased fuel wood or charcoal.

To improve the access to domestic biogas for poor households, the UDBP will link with Heifer / Send-a-Cow and other relevant rural development initiatives. Micro-credit schemes and heifer exchange initiatives will make the technology available for poorer households entering in livestock keeping⁵.

4 Description of the sector

In concept, the (future) domestic biogas sector can be segmented in:

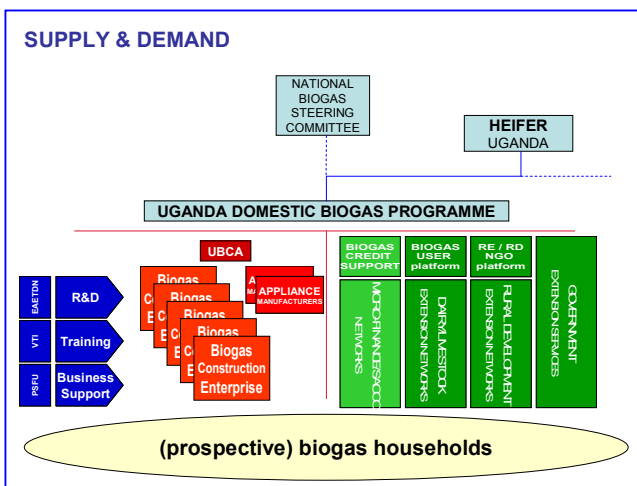
- organizations creating and organizing the demand for biogas services, the demand side, and;
- organizations providing the biogas services to the target group, the supply side.

The main responsibility of the sector's **supply side** is to establish a commercially viable biogas sector that:

- provides "off the shelf" high quality biogas installations, and;
- ensures the continued operation of all biogas plants installed under the programme.

The **demand side** of the sector will be involved in organizing the potential target group to:

- increase public awareness of the technology;
- provide credit to prospective biogas households;
- stimulate optimum use of the installations, and;
- integrate the technology in rural development.



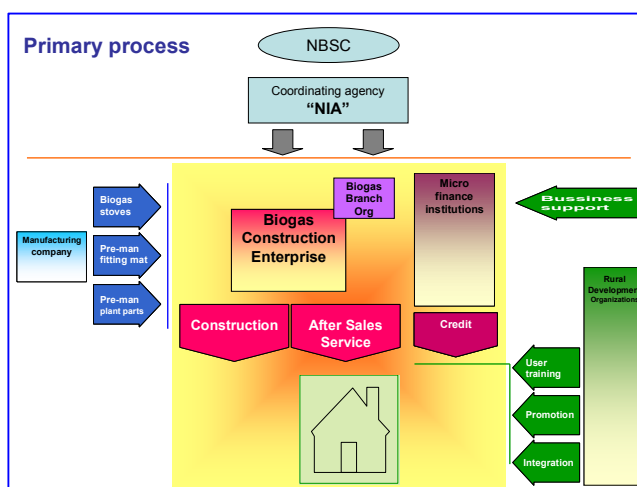
5 Description of the primary process

The core of the primary process is in the commercial transaction between the (prospective) biogas household and the Biogas Construction Enterprise (BCE), in which both parties aim to maximize their returns. The first party by demanding the best possible service level at the lowest possible costs, the latter aiming for high profit and future market penetration.

In this process, the importance of the quality of domestic biogas cannot be overstated. Particularly in a rural setting, a household that is satisfied with the benefits of a biogas plant is by far the most powerful promotional tool for the technology. Clearly, however, this works in two ways; an unsatisfied owner will cast a bad reputation on the technology, with a disastrous effect on market development. Hence, the margin for error, especially in the early days of a programme, is very small.

An enabling environment for the above described primary process to blossom would have the following salient features:

- Potential customers are well informed on costs and benefits, but also limitations, of the technology.



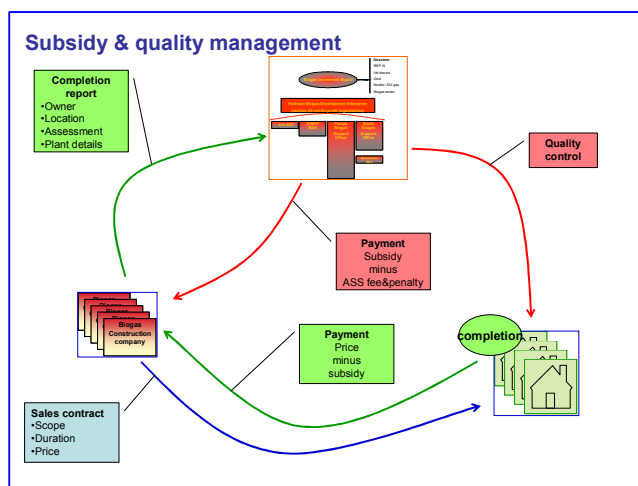
⁵ Clearly, households just having received their first heifer would not qualify.

- Biogas service providers are rooted in the local society, to ensure that initial as well as follow-up services are easily available.
- BCEs operate on a level playing field; standardized technology is marketed together with transparent quality standards and quality control and enforcement.

In such an environment, BCEs have a vested interest in providing high quality services at competitive rates as a means to safeguard and expand their market. Hence, the main responsibility of the Uganda Domestic Biogas Programme is to create and maintain the required conditions.

The UDBP will create these conditions, amongst others, by:

- Standardization of plant design, and appliances as well as after sales service and quality protocols;
- Assuring proper Biogas Mason and Biogas Supervisor training (both initial and refresher) and certification, whereby only plants constructed / supervised by certified manpower will be allowed for subsidy;
- Control on the quality of services (construction and after sales service), whereby the programme will maintain a track record of masons / companies, and BCEs will be graded for their performance;
- A penalty / bonus arrangements on the subsidy reimbursement depending on the quality of services;
- An after sales service fee retention scheme, whereby BCEs will only get paid for their services after they have visited the installation;
- A fairly comprehensive business development component, coaching BCEs in growing their business.



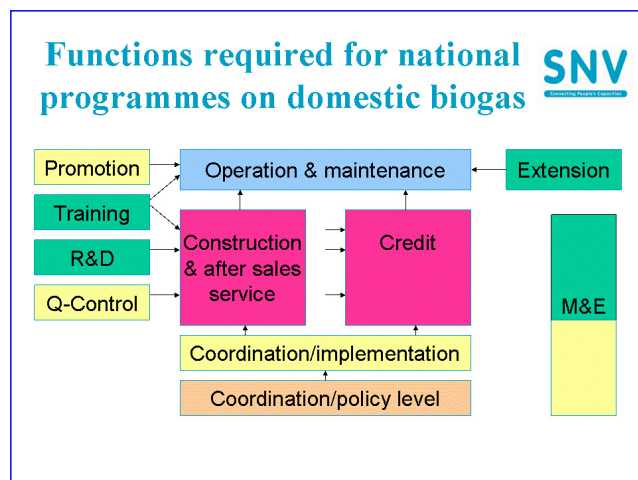
6 Description of the multi-actor approach

National biogas programmes require a wide range of functions to be executed in a comprehensive and coordinated manner. Examples of such functions are promotion and marketing, financing, construction & after sales, operation & maintenance, quality control, training & extension, research & development, monitoring & evaluation, and programme management.

Whereas the function of operation & maintenance can only be executed by the customers, other functions should as much as possible be undertaken by multiple rather than single stakeholders to avoid monopolies, dependencies and conflicts of interest. This allows competition at the supply side from which ultimately the users will benefit.

Another consideration directing towards this multi-actor approach is that successful programmes would quickly grow too large and complex to be run efficiently by a single actor.

National and local governments, the private sector and NGOs can only fruitfully work together in the programme on the basis of proper role divisions, suitable



institutional arrangements and good governance. Governments should not engage in construction or credit facilities, but could be involved in facilitation, promotion, regulation, financing and lobby for donor funding. Similarly, credit providers should not involve in construction (but can play an important role in promotion).

Proper institutional arrangements are required; multiple stakeholders, like construction companies and banks/MFIs, can only compete at a level playing field. Such arrangements should first of all be in place between user and supplier in the form of sales contract, guarantee card, credit agreement, etc, but also between the implementing agency and the primary suppliers (companies and banks/MFIs). Parallel programmes with different implementation modalities need to be avoided as these will distort the market. Good governance (transparency, accountability), by all actors, is paramount for all transactions to be concluded in the programme.

7 Apex actors in the sector

7.1 The National Biogas Steering Committee

The National Biogas Steering Committee (NBSC) will facilitate the establishment of a commercially viable domestic biogas sector in Uganda. To that extent, the NBSC will:

- Ensure that the Uganda Domestic Biogas Programme (UDBP) is implemented in line the programmes Programme Implementation Document (PID) and with the Government's policies on rural energy, rural development, livestock and agricultural development, employment creation and poverty reduction.
- Oversee the Uganda Domestic Biogas Programme, ensuring the implementation meets generally accepted standards for project management and administration.
- Assist the UDBP in developing domestic biogas as a mainstream domestic energy source in Uganda.

Members of the NBSC will represent the Government and relevant line ministries, civil society, end-users, finance institutions, the National Implementing Agency (NIA), programme donors⁶ and the UDBP Programme Coordinator (secretary) and the private sector. The NBSC will be chaired by the Ministry of Energy and Mines Development (MEMD) as the lead ministry in the sector. Details of role, responsibilities and procedures will be detailed in the ToR for the NBSC.

Responsibilities of the NBSC include:

- Endorsement of the programme's strategy;
- Facilitation of a conducive programme environment;
- Establishing high-level linkages between relevant policies and organizations and the programme;
- Programme monitoring at a general level.

To enable effective programme monitoring, the NBSC's responsibilities include more in detail:

- Approval of the annual activity plan & budget and the mid-term activity plan & budget review;
- Approval of the annual report;
- Approval of the management reply on the programme's audit reports, and;
- Approval of the management reply on the programme's evaluation reports.

An approved annual activity plan & budget will create the mandate for the UDBP to implement activities and corresponding expenditures. Approved annual reports, together with the management reply on audit reports, will form the justification of the programme to its partners. The NBSC will meet three times per annum:

- in March to discuss and approve the programme's annual plan;
- in September to approve the programme's annual report, audit report and management reply, and;
- in October to discuss and approve the programme's mid-term activity and budget review.

⁶ Hivos, the fund manager of the ABPP, will be a voting member and will have veto right on financial matters concerning DGIS funds.

7.2 The Uganda Biogas Programme Office

The Uganda Biogas Programme Office (UBP-Office), hosted by HEIFER INTERNATIONAL UGANDA (HIU) and with the NBSC as its Governing Board, has coordinating, regulating, facilitating and (some) implementing functions.

HIU will be the host organization for the UBP-Office, whereby the UBP-Office will be established in the premises of HIU in Kampala. The precise organizational arrangements required for HIU to successfully host the UBP-Office will be detailed during an organizational self assessment planned for the 3rd quarter of 2009. Key in the arrangement, however, will be the creation of an organization with a fair degree of autonomy and business orientation, able to react pro-actively to developments in the sector.

The main tasks of the UBP-Office include:

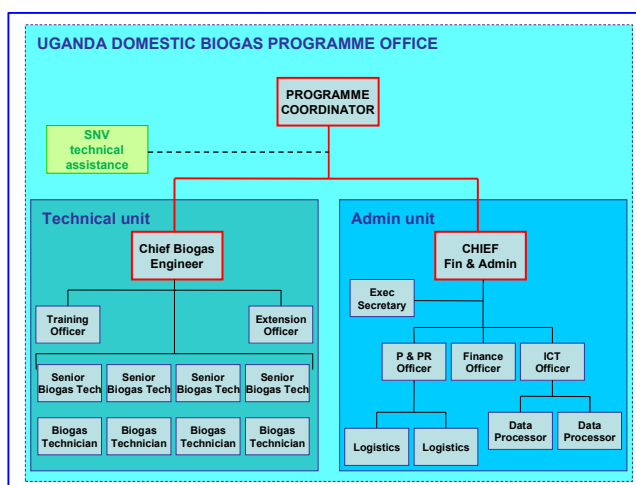
- Identification, selection and coordination of programme partners and their activities (main activities: awareness & promotion, biogas credit arrangements, quality control, training, extension, R&D, monitoring and evaluation);
- Endorsement of homologation and standardization of biogas plant- and appliance design;
- Development of construction and after sales service routines;
- Development and certification of quality management, BCE grading and subsidy disbursement routines;
- Selection, training (ToT) and monitoring of Vocational Training Institutes for technical training on biogas construction, after sales service and supervision, and; bio- slurry use
- Certification of biogas masons, supervisors and inspectors;
- Quality management and subsequent accreditation of BCEs;
- Management of subsidy and -possibly- carbon revenue streams.

The UBP-Office will:

- formulate a detailed annual activity plan and budget (submitted to the NBSC in the first week of February);
- formulate a mid-term activity and budget review (submitted to the NBSC in the first week of August), and;
- submit its annual report to the NBSC mid of February.

The activities of the UBP-Office will be divided over two units. Eventually, as per the table, the UBP-Office will employ about 21 staff.

UBP-Office staffing		[# of persons]
Programme Coordinator	PC	1
Chief Finance & Administration	CFA	1
Chief Biogas Engineer	CBE	1
Finance Officer	FiO	1
Promotion & PR Officer	PPO	1
Training Officer	TrO	1
Extension Officer	ExO	1
ICT Officer	ICO	1
Senior Biogas Technician	SBT	4
Junior Biogas Technician	JBT	4
Executive Secretary	ExS	1
Data Processor	DaP	2
Support Staff	SuS	2
Total staff		21



7.3 ABPP and Hivos

The initial and main source of funding for the UDBP is the African Biogas Partnership Programme (ABPP). Hivos is the Fund Manager of the ABPP. The funds for the UDBP will be provided by the Hivos-ABPP office in Nairobi, based on the plans and budgets approved by the NBSC and Hivos ABPP staff in Nairobi.

7.4 International Technical Assistance

SNV-the Netherlands Development Organization will make experts available to provide technical assistance to the programme as a whole⁷ (apex, supply- and demand-side). The experts will link the Uganda programme with the wider framework of the African Biogas Partnership Programme (ABPP) and the Asia Biogas Programme (ABP), and assist with the programmatic, technical and administrative aspects of the programme.

7.5 Ministry of Energy and Mines Development

In the framework policy of the Ministry of Energy and Mines Development (MEMD) to increase the number of domestic biogas installations in Uganda with 100,000 by 2016, the MEMD will be requested to contribute the UDBP. Details of the arrangement, whereby for instance MEMD contributes an annually increasing share of the subsidy expenditures to the programme⁸, will have to be agreed during the PID formulation.

8 Primary process actors in the sector

8.1 Biogas Construction Enterprises

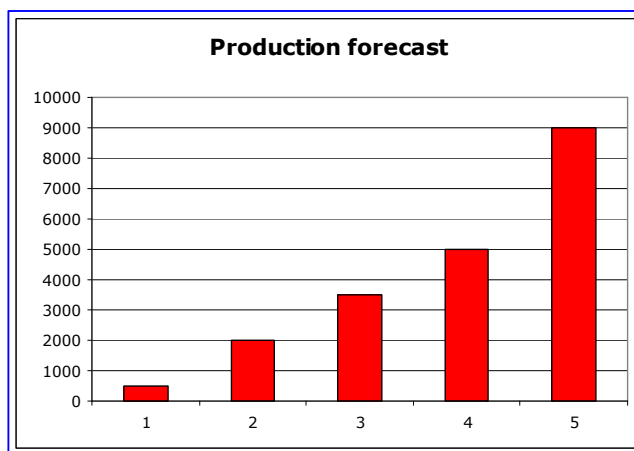
Despite initiatives aiming to introduce domestic biogas as a mainstream energy technology date back to the early 70s of the previous century, dissemination has been reluctant. The feasibility study estimates some 500 to 600 installations have been constructed. As many of these installations were constructed as demonstration plants, the commercial viability of a biogas sector in Uganda remains to be proven.

As a consequence, the human resource base for stepping up disseminations is extremely limited, with some 6 constructors / companies identified. The main driver of domestic biogas dissemination currently is the HEIFER UGANDA programme, having installed (though independent constructors) some 500 installations and manufacturing its own appliances (stoves, lamps).

Typically, BCEs come in sizes varying from single mason (proto-) enterprises constructing 20 to 40 plants per year to companies employing up to 40 biogas masons and a significant number of supervisors, constructing perhaps over 1000 plants per year.

Whatever size a company reaches, key to ensuring proper quality and after sales service is that companies are rooted in their area of operation. For larger companies, covering larger areas, this will imply opening branch offices.

With the programme, as per the feasibility study, targeting to construct 20,000 domestic biogas plants over a period of five years, some 500 Biogas Masons and 83 Supervisors, organized in smaller or larger BCEs, should be active in year 5 of the programme.



⁷ NB, the TA budget for SNV advisors is additional to the ABPP funding, and is sourced from SNV's core funds.

⁸ Nepal and Vietnam, in different modalities, contribute to the subsidy component of their respective biogas programmes. For Tanzania a contribution of 15% in the first year, increasing to 75% in the fifth year, is proposed to the Renewable Energy Agency.

To establish these BCEs, the programme can explore the following pathways:

*Selecting individual masons*⁹: Most villages will have masons employed in housing and rural infrastructure. During the village promotion workshops, and with the assistance of local rural development programmes (KRC, SEND A COW, HEIFER, NOGAMU, VEDCO, SATNET, GREEN HOME, JESE, etc.) these masons can be selected and, assuming the masons are interested, been offered training in domestic biogas construction. However, where masons working in civil and community infrastructure are working for a daily wage, the difference here will be that masons are expected to start operating independently, as an entrepreneur. This will be an important difference to be clarified during selection, and possibly these (very micro-) enterprises need extra initial support.

*Advertisement*¹⁰: The programme can formulate criteria for Biogas Construction Enterprises, and reach (potentially) interested parties by advertisement. Selection, based on the set criteria, will be the responsibility of the programme. This modality will likely attract more entrepreneurial persons / organizations and –possibly- existing enterprises that would like to extend their scope of activities.

Inclusion: Interested NGOs¹¹ may choose to include providing biogas construction and after sales in their services. Especially where these NGOs are already disseminating domestic biogas, the programme should aim to embrace this opportunity. It should be noted, though, that the UDBP aims to have private enterprises responsible for rendering biogas services to rural households. Therefore, possibly after a transition period, NGO's will be requested to privatise their construction units.

*Tendering*¹²: The programme can divide the programme area in tender-lots (based on e.g. technical potential) and develop tender criteria. These tender lots can be tendered to interested parties. Selection will take place on tender criteria and the bid. This modality tends to attract commercial, large organizations, not necessarily with their roots in the locality, and eliminates competition at local level.

The last modality, tendering, may not be appropriate for a biogas sector, as the goal is to have biogas services, over a longer period of time, accessible to households. The programme will, therefore, use a mix of the first three modalities; selection of masons, advertisement and inclusion.

8.2 Uganda Biogas Association

The programme will support the Uganda Biogas Association (UBA). The UBA will provide a platform for their member-BCEs regarding promotion and marketing and market regulation. The UBA will represent the interests of BCEs regarding policy development, regulatory (quality) and legal issues at provincial or national level.

8.3 Micro-finance Organizations

Domestic biogas installations require, despite the proposed investment subsidy, a significant upfront investment of the household; tentative estimates indicate a remaining contribution of the household to the tune of one million Uganda Shilling for a small sized plant. Such an investment will be beyond the capacity of many rural households.

⁹ This modality is used in Vietnam's national biogas programme; over 200 BCEs were working under the programme after 4 years of operation. BCEs are typically small and are working in a limited area. More recently, this approach is taken in Tanzania's domestic biogas programme.

¹⁰ This modality has been applied in the biogas programme in Nepal. The programme started in 1992, and currently over 60 BCEs are working under the programme. The BCE size in Nepal shows a "Pareto division" roughly 80% of the construction is done by 20% of the BCEs.

¹¹ In Nepal UNDP-supported NGOs included biogas construction and after-sales services in their services. For that purpose, however, these services were established as separate private enterprises, to avoid BCE competition at unequal footings.

¹² Tendering of programme areas as tender-lots is applied by the SHS programme under ASER, Senegal.

Micro-finance arrangements could spread the up-front investment over a period of 2 to 4 years. Stakeholder consultations with micro-finance organizations in March 2009 indicated enthusiasm from FINCA and UFT to partner in the programme. However, their loans, by law, are limited to a maturity of 2 years and interest rates of 2.5% per month (on the initial principal) may prove prohibitive for rural households. FINCA indicated, however, to be interested in a pilot together with the programme in which biogas loans are offered under their Home Loan product, whereby a loans with a maturity of up to 10 years against a monthly interest of 2% can be made available. As soon as the programme is operational, it will cooperate with FINCA to test this interesting proposition.

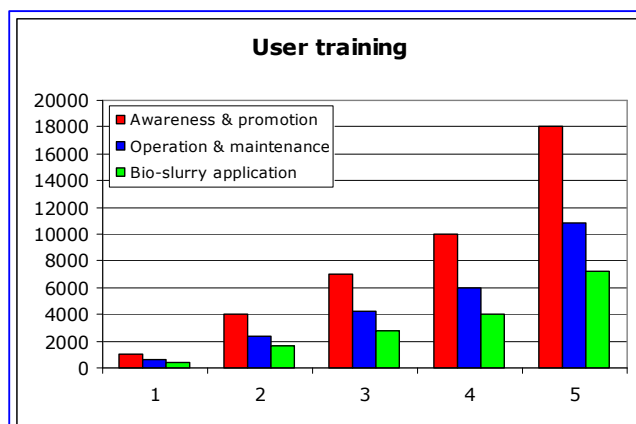
9 Support process actors in the sector

9.1 Rural Development, Renewable Energy and Organic Farming NGOs

Uganda appears to have a dense network of NGOs working in rural development, renewable energy or organic farming (to name some of the visited organizations; SEND A COW, VEDCO, NOGAMU, SATNET, JESE, KRC, HEIFER UGANDA) . Domestic biogas, with its benefits in the fields of agriculture, family health and sanitation, domestic energy and environment, fits well in their awareness, promotion and dissemination activities.

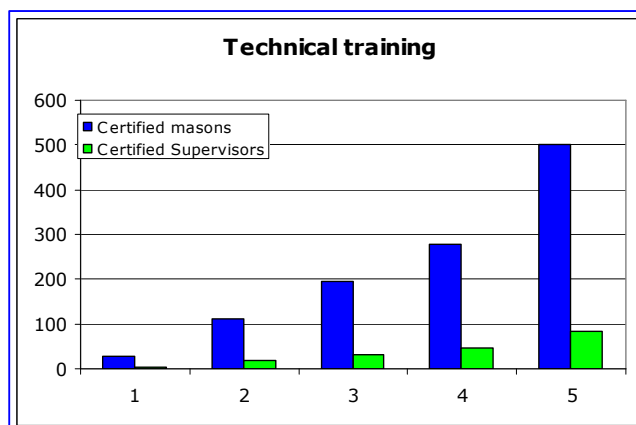
Meeting its targets, the awareness and promotion of the programme will be large; in year 5 alone, some 18,000 potential households would have to be reached. For that purpose, the programme will integrate its Biogas Awareness and Promotion activities in the activities of these NGOs

Beyond initial awareness and promotion campaigns, user training will prove one of the main activities of the programme, and also in this activity NGOs, through their rural infrastructure, can play a major role.



9.2 Vocational Training Institutes

The technical training requirement of the programme is large. Moreover, sustainability considerations will direct the programme to existing, local training institutions as they can be developed not only as a biogas training centre, but also as a local knowledge centre. Eventually it is the aim of the programme to have technical biogas training (Biogas Masons and Biogas Supervisors) included in the regular curriculum of the selected VTIs as short term courses that can be provided on demand



9.3 Private Sector Foundation Uganda

The Private Sector Foundation Uganda (PFSU), directly or through its network of capacity builders, is experienced and well placed to assist the programme in rendering business development services to BCEs.

9.4 East Africa Energy Technology Development Network

The East Africa Energy Technology Development Network (EAETDN) is a membership organisation with members ranging from the academic world to the private sector, including e.g. gender and finance. EAETDN takes part in a regional network including SCODE in Kenya and TATEDO in Tanzania. The wide range of

expertise will make EAETDN particularly valuable for the programme's applied R&D activities and the development and implementation of its impact and baseline studies.

9.5 Actor – activity matrix

Below the detailed actor – activity matrix for the Uganda Domestic Biogas Programme, based on the detailed Institutional Arrangement Consultations of the mission. The actor list is likely still incomplete. Completion and adjustments are proposed to be made during the formulation of the PID.

Programme functions	MEMD	Makerere University	Uganda Biogas Association	EAETDN	PSFU	FINCA / other MFIs	Send a Cow Uganda / other NGOs	Biogas Constr. Enterprises	Heifer Int Uganda	UDBP-office
Awareness, promotion, marketing		Development promotional material / models, strategy advice, gender	Promotion of domestic biogas to households	Awareness creation, promotion and extension services at HH and comm. level		Promotion	Promotion / awareness in area of operation	Marketing	Promotion / awareness in area of operation	Initiation / coordination. Development promotional material.
Finance; investment finance and credit	Linkage to government contribution			Development of biogas-financing models, loan guarantee fund, vendor financing,		Biogas loan product (testing etc)	Linkage to SACCOS / groups			Credit: initiation monitoring. Subsidy: channelling, monitoring
Manufacturing, construction, after sales service		Manufacturing training facilities, curriculum development / assistance for technical training	Forum for discussion on all aspects of the technology. Enhance information and knowledge sharing among members.	Business development services, business mentoring	Business Development Services (outsourced)		Supervision of construction / ass in their areas of operation	Construction, after sales service	Stove / lamp production	Initiation BDS & technical support
Quality management and control			Develop (jointly with NIA) quality standards for biogas plant construction and appliance manufacturing							Endorsement and imp of quality standards through QC, creating learning feedback, Quality mgt Inspection of plants
Technical, business and O&M training			Assist in technical training*	Private enterprise development training, User training, Curriculum and tools development			User training O&M, bio-slurry	Initial user instruction		Initiation etc
Bio-slurry extension		Agricultural research, extension material development	Promotion of bio-slurry application in agriculture	Appropriate use of bio-slurry, dev of trg and ext meth. demo-sites			Extension / demonstration in areas of operation		Extension / demonstration in areas of operation	Initiation etc.
Institutional support and capacity building			Linkage with other (ABPP) biogas associations							Stakeholder management & support
Monitoring and evaluation		User /baseline surveys, student involvement, gender		Monitoring of construction					Monitoring of programme activities	Monitoring partners activities
Research and development		Stove design, alternative feeding, student involvement	Participate in applied research on biogas technology							
Programme management	Chairing NBSC Policy guidance				Programme management advice (solar experience)				Programme contract partner	Administration, coordination, initiation