

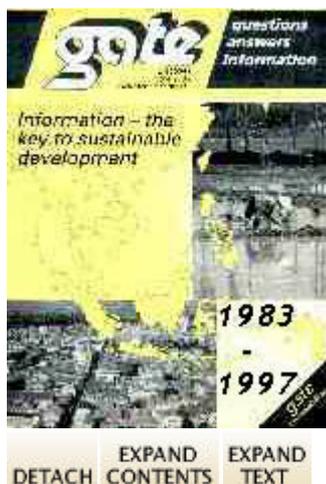
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Nepal's biogas support programme: Well designed

by Werner Kossmann

Nepal's Biogas Support Programme can be seen as a model for such programmes **in** other countries. It is well designed and successfully implemented, and demand for the technology is growing impressively. At the institutional level there is successful, exemplary co-operation between the governmental and (semi)-private sectors. The involvement **of** NGOs and new private construction companies appears to stimulate the market. At the technological level, the biogas construction system is appropriate and reflects a high standard **of** reliability. This article describes the successful spread **in** the **use of** biogas **in** Nepal.

The number **of** households with cattle and/or buffaloes **in** Nepal **in** 1991 was estimated to be two million. Based on this figure, the potential number **of** biogas plants **in** Nepal was estimated at 1.3 million.

By the end **of** February 1993 a total **of** about 12,000 biogas digesters had been built. The concentration **of** these plants is now higher **in** urban areas and **in** those easily accessible by road. This has been attributed to the increasing scarcity **of** firewood **in** these areas and easier transport **of** materials.

Actors involved

In Nepal the promotion **of** biogas technology as a national programme was first initiated **in** 1975/76. **In** 1977 the Biogas and Agricultural Equipment Development Ltd. (known today as the Gobar Gas Company Ltd.,GGC)was established. This company was set up as a joint venture **of** the Agricultural Development Bank (ADB/N), the United Mission to Nepal and the Nepal Fuel Corporation. The GGC, a private company with close affiliation to the public sector, was entrusted with the overall responsibility for the promotion **of** the biogas technology **in** Nepal.

Since about 1990 six new private companies have been established and they are now competing for biogas customers. **In** order to guide and coordinate the present development **of** the biogas sector, the need for the establishment **of** a biogas centre was raised. **In** particular, private sector involvement calls for more regulations and guidelines.

National and international NGOs are actively involved **in** the implementation **of** biogas plants **in**

Nepal. Orientated mainly towards community development work, the concept **of** biogas technology is most favourable for them. An existing infrastructure, down to the farmers' level, provides optimal conditions for the extension **of** the technology. Besides organising motivation and awareness campaigns, the roles **of** NGOs **in** the dissemination **of** biogas technology are many, and include training for users, technical follow-up and acting as mediators between other institutions involved. For sanitation purposes, NGOs often promote the integrated biogas-latrine system approach.

The Biogas Support Programme (BSP) is a joint venture **of** the Agriculture Development Bank, the Gobar Gas Company and the Netherlands Development Organisation (SNV-Nepal).

The contribution (US\$ 4.8 million) **of** the Dutch government for the implementation **of** a large - scale biogas dissemination programme IS noteworthy. The Dutch government seems to have a high degree **of** confidence **in** this technology.

The BSP started **in** August 1992 and its first phase terminated **in** July 1994 with the second phase lasting three years until July 1997. A budget **of** approximately US\$1.8 million has been allocated for the first phase **of** the project and US\$3.0 million for the second, which will be spent mainly as a direct subsidy for biogas plants.

Financing

According to government policy as formulated **in** the eighth Five Year Plan, financial support is provided for the construction **of** biogas plants. At present His Majesty's Government **of** Nepal (HMG/N) provides Rs. 7,000 and Rs. 10,000 subsidies to the construction costs **in** Terai (low land area) and the hills, respectively. This attractive amount meets more than 50% **of** the total costs **of** a family-size biogas plant.

All subsidies for biogas plant construction are channelled through the ADB/N. Although other banks are entitled to provide loans for biogas installations, the ADB/N is practically the only bank **in** Nepal that avails loans for biogas plants, due mainly to its large network **of** branches nationwide.

Before granting a loan, the ADB/N requires the name **of** the biogas construction company to ensure the loan's proper **use**. Sufficient collateral along with citizenship and land-ownership certificates are required prior to approval, which will be finally given after ADB/N personnel have inspected the farm for collateral and cattle population as a principle precondition.

After loan approval, the bank issues a coupon (order form) to the construction company, which can then start to commission the construction. Usually, the user assists **in** allocating construction materials such as bricks, stones, sand and gravel, and providing unskilled labour. Digging is also generally done by the owner but remaining materials and construction work are supplied by the company **in** advance.

After construction, the user fills out a so-called "Utility Form" for the ADB/N, indicating their satisfaction with the services **of** the company, which can then claim reimbursement from the bank against the coupon. The amount paid is credited to the users and the subsidy is finally deducted by the ADB/N from the loan. The remaining part has to be repaid with a current interest rate **of** 18% over a period **of** seven years.

Construction

The type **of** digester built **in** Nepal has changed from the floating drum to the Chinese fixed dome design. The standard sizes currently available are 4, 6, 8, 10, 15 and 20 m³. While the lower part **of** the digester is built by a brick-laying technique, using burned bricks or natural stones, the upper dome part (the gas collecting section) is made **of** cast concrete. The casting technique developed is

well suited for the **rural** situation **in** Nepal where the allocation **of** bricks is costly. The construction technique for making the concrete dome is simple and highly reliable, but labour intensive.

The construction process lasts about 10-14 days according to the size **of** the plant and availability **of** labour. Usually, one mason is **in** charge **of** the construction with up to 30 labourers assisting, depending on the stage **of** the construction (ea. soil digging).

All accessories, for example valves, gas stoves and lamps are provided by the construction company. The materials used are made locally except for the main gas valve which is imported from the Netherlands.

Latrine connections to biogas plants have just recently been introduced to the Nepal Biogas Programme, because a nigh/soil-operated biogas plant was not accepted, due mainly to cultural (Hindu) restrictions. With the help **of** NGOs, the GGC gradually started an awareness campaign on this subject and shortly after demonstrating the advantages **of** the "bio-latrline system" a growing response and demand for latrines developed. Obviously **in** smaller systems, gas production can be increased considerably by a connected latrine, especially during winter time.

With regard to new, recently established private biogas companies, all designs and drawings are basically standardised and follow that **of** the GGC. However, **in** some cases the quantity and quality **of** construction materials differs widely, causing confusion among the users.

A guarantee is part **of** the "after-sale-service" and is provided by the company that installs the biogas unit. A guarantee **of** six v ears for the digester part itself and one year for the appliances, such as lamps, stoves etc. is usually provided. The guarantee is a fixed part **of** the total investment by the owner. The GGC charges about Rs. 4,500 for the masonry **of** a 10 m³ biogas plant, including the guarantee fee.

The craftsman or supervisor from the company usually inspects each plant at least once a year; even without any claim being made by the owner, to ensure proper operation, thus avoiding unnecessary repair costs. Besides top quality construction, proper advice to the customer **in** the operation and maintenance **of** the plant is considered an efficient way to ensure a plant functions well and to keep repair work to a minimum.

Benefits

Besides health and sanitation concerns, the biogas plant user is most interested **in** the biogas and fertilizer obtained from the system.

The time and hardship, especially for women, involved **in** collecting firewood and cooking is immense and can be drastically reduced through biogas technology.

With a total **of** approximately 12,000 biogas plants constructed, **of** which 90% are **in** operation, and an average gas production **of** 1.40 m³/dav yielded, a total volume **of** about 20 million 1113 **of** firewood could be replaced annually by biogas.

At the household as well as the national level the benefits gained by biogas seem to be obvious and underline the growing support for the technology. Growing demand and a well-adjusted subsidy programme constitute a viable approach to counter environmental problems and finally contribute to the improvement **of** living conditions **in rural** areas **of** Nepal.

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