

ONGOING PROJECT EVALUATION

DRAFT SUMMARY

Background

- 1.01 The main energy sources for domestic use in the rural areas of Nepal (and many people in the urban areas) are fuelwood for cooking and kerosene for lighting. As part of an overall strategy to reduce both pressure on forests and the cost of imported energy, the government of Nepal has been putting emphasis on renewable sources of energy, such as biogas.
- 1.02 The Agricultural Development Bank of Nepal (ADBN), established in 1968, was given the responsibility of financing the extension of biogas technology in Nepal, mainly by providing loans to individual farmers to purchase biogas plants. The Gobar Gas Company (GGC), set up in 1977 as a subsidiary of ADBN, had built most (1490) of the 1898 biogas plants built in Nepal up to the middle of 1985.

The Project

- 1.03 The project's development objective was to replace fuelwood and kerosene with an alternative fuel, biogas, to improve the quality of life of rural families, especially in the hill areas and to save foreign exchange spent on imported energy and fertilizers.
- 1.04 To do this, 970 biogas plants (670 of 10 m³ and 300 of 6 m³) were to be built under the auspices of the project, providing grant (subsidy) financing for part of each installation (to cover the cost of imported materials) and loan finance for the rest, although the farmers are expected to contribute towards labor costs. The GGC facilities were also to be upgraded by providing the finance for two new workshop-office-storage buildings and equipment. Further grants were available for the purchase of motor-cycles, to cover additional transportation costs to build 70 of the plants in remote districts and for staff training.
- 1.05 By mid-1991, 927 biogas plants (636 of 10 m³ and 291 of 6 m³) were built, although only \$213 523 of the \$493 382 of the loan money set aside for building plants had been disbursed. Also construction work on the new buildings for the GGC had not been started, nor had equipment for these buildings been purchased.

Results

- 1.06 All parties, the Ministry of Finance, ADBN and GGC have indicated a strong commitment to the project. GGC and ADBN have furnished extensive documentation showing how the project has been implemented, including a full list of names of farmers for whom biogas plants have been built under the project, by district.

- 1.07 The project seems to have been well administered according to the project plan, apart from some minor problems. Instead of using grant money to purchase materials, ADBN used it as a direct subsidy to farmers. GGC used the working capital fund to purchase the materials required to build plants in 1988/89. ADBN inadvertently double accounted part of the loan fund, but the error has been pointed out to them.
- 1.08 The government and ADBN's input to the project includes land provided to the GGC, worth Rs.7,000,000 (\$233,333). The government also provided a subsidy of Rs.4,360,945 (\$145,364) to 6 and 10 m³ biogas plants built over and above the UNCDF project total. ADBN continued to pay subsidies at the same rate (25%) out of its own capital, of which Rs,3,287,659 (\$109,589) was for 6 and 10 m³ sized plants, when political instabilities stopped the government subsidy between July 1990 and July 1991. ADBN underestimated the demand for biogas and set low budgets between mid-1988 and mid-1990, so they were unable to request finance from UNCDF to cover loans already given to farmers.
- 1.09 The field survey covered 34 biogas plant owners and 15 non-owners in six districts including two designated "remote". The time allowed and the monsoon season meant that the sample of plants was heavily biased towards those near an all-weather road in accessible areas. Travel was difficult and farmers were usually very busy in their fields, so visits were usually made early in the morning or in the evening in an attempt to find people at home.
- 1.10 Study was also made of five other surveys of biogas plants in Nepal. One by the GGC of 150 plants is taking over a year to do, including over 130 man-days of field visits. The results of these surveys were fairly well in agreement with the results of this evaluation survey.
- 1.11 The whole process of selling biogas plants, organising loans, obtaining materials, building plants and doing follow-up work seems to be fairly well organised, despite the somewhat bureaucratic system involved. Both the ADBN and GGC allow a fair degree of decentralised decision making, giving their local offices the responsibility of approving customers, making loans and confirming plant completion for payment. The project is effectively monitored by both ADBN and GGC head offices.
- 1.12 The Butwal workshop, that makes most of the components for biogas plants, is equipped with old machines and needs major refurbishment. New workshops are required to meet future demand for biogas plants.

- 1.13 The system seemed to work less well in East Nepal. Some of the plants were poorly built, suggesting that better training and supervision of technicians is required, together with better field checking and follow-up, both from the GGC and ADBN offices in the area. The planned course in India, under the UNDP grant might encourage a better management approach.
- 1.14 The growth in the biogas program was not well predicted, ADBN local offices found themselves exceeding their loan targets for biogas plants by up to 500% between 1988 and 1990. The future growth of the biogas program in Nepal is expected to be even higher, with a target set for 1991 to 1996 of at least 20,000 biogas plants. UNCDF's contribution to the larger program has been in helping to build up GGC to be able to meet this expanding target. New buildings and equipment for GGC should have a high priority.
- 1.15 The Dutch government (SNV) is proposing to fund 20,000 biogas plant subsidies between 1991 and 1996 and also a study on how to privatize the extension of biogas technology. GGC already subcontracts some of its plant building work to local masons. Emphasis should be placed on helping GGC to have a more commercial approach to its work.
- 1.16 All users found cooking by biogas easy, quick and without the attendant smoke of wood fires. The women who did the cooking gained the most benefit. The savings on fuelwood were estimated to be of the value of Rs.2 million or 1200 m³ of wood per year, since the savings are not usually in cash. Savings in kerosene and chemical fertilizer are estimated to be almost Rs.1 million a year, although farmers are not using the effluent slurry as fertilizer in the most effective way. Improvements need to be made in the reliability of biogas lights and gas production at lower temperatures.
- 1.17 ADBN have used the popularity of biogas plants to encourage the building of latrines linked to the plants. While some cultural resistance needs to be overcome, this does not act as a disincentive to setting up the biogas units.
- 1.18 The penetration of biogas technology into "remote" or underdeveloped areas is slow, with only 15 plants having been built in the five assigned districts. The most effective way to publicize biogas technology is through people seeing a working plant in operation. In the two underdeveloped areas visited, the demonstration effect was beginning to work and interest in biogas technology was increasing among non-users.

Conclusions

- 1.19 a) Biogas is a technology that is well suited to conditions in Nepal and is meeting a basic need for cooking fuel, that is reducing the use of firewood and the attendant problems of deforestation, land erosion etc.
- a) Biogas technology tends to reach the middle income groups in rural and semi-urban areas. It is penetrating into the Small Farmers' Development Groups, but they have a problem in finding cash to repay the loans.
- b) The most popular plants were of the 6 and 10m³ size, as they can meet the domestic energy needs of most small farmers.
- c) The system set up by AD BN and GGC for building biogas plants is effective, with checks to ensure the loan and subsidy are used for the purpose for which it was intended.
- e) A major problem for many farmers was the removal of interest rate subsidies in 1990, as they were promised they could pay a rate of only 7.5% for the whole of their loan period (7 years).
- f) As part of the process of selling biogas plants, ADBN and GGC are helping farmers become more conscious of the problems of deforestation and the environment.
- g) The direct beneficiaries of biogas technology are the woman who can cook food in half the time and are saved from the bad effects of a smoke filled kitchen.
- h) There are still problems with the use of biogas technology in Nepal, such as helping farmers find the best way to use the effluent slurry as fertilizer, finding a more reliable design of lamp and improving biogas production in cold weather. 90% of all of the plants built by GGC are still producing biogas.

Recommendations

1.20 General project operation

- a) The management structures of GGC should be further strengthened, by building up the evaluation and monitoring division in the Kathmandu HO, to do more field surveys of plants built and spot checks on local office operations.
- b) The future organizational structure for the extension of biogas technology needs to be carefully considered, especially in the light of a desire to privatize the process as far as possible.
- c) ADBN should check its accounting system for the loan component of the UNCDF funds.

1.21 UNCDF present project

- a) Loan disbursements should be made to ADBN, as requested against plants built, up to the budget limit (\$207,668 remaining).

- b) The remaining grant money be used to subsidize biogas plants up to the budget limit (\$73,146 remaining).
- c) Grants should be made for plants built in "remote" areas for 15 more plants. Any remaining money should be re-allocated to the subsidy budget (\$5,683 remaining).
- d) The planned building at Itahari should be constructed on the land available, but with a reduced budget allocation (\$33,000). The remaining \$11,000 should be assigned to the Butwal workshop for upgrading the building.
- e) The bulk of the workshop equipment budget (\$37,000) should be used to purchase machinery for the Butwal workshop, with the remainder being used to set up a small workshop in Itahari.
- f) The remainder of the office equipment and transport budgets (\$10,475) should be used to purchase a computer for the Kathmandu HO.
- g) Any remaining money still available could be put towards a 4-wheel drive pick-up.
- h) The UNDP money (\$7,000) should be disbursed to send GGC officers on a suitable course in India.

1.22 Further UNCDF and UNDP project involvement.

With a the proposal for funding subsidies for 20,000 biogas plants in the next five years and the expected signing of the Sixth Credit Plan for loan finance from AsDB to ADBN, the major need is to build up GGC to meet the expected demand for biogas plants, but also to prepare it for privatization. A second phase of UNCDF funding is recommended, mainly to build up the production capability of GGC. UNICEF should also be involved in the promotion of biogas technology as it does directly improve the daily life of women in Nepal as well as family health.

1.23 A second phase of project funding should include:

- a) workshops in Itahari and Nepalganj;
- b) equipment for these workshops and computers for the Regional offices;
- c) Provision of subsidy grants for up to 5,000 more biogas plants;
- d) Encouragement for joint R & D work with institutions such as the Rampur Agricultural campus and the Forestry Institute at Pokhara in such areas as the best use of effluent slurry as a fertilizer and the best ways to improve gas production at low temperatures;
- e) support for training of research workers in R & D at eg. Reading University in UK;
- f) support for training of supervisors and extension workers so they can advise farmers of the best ways to use biogas technology.