BIOGAS SUPPORT PROGRAMME, BSP-NEPAL

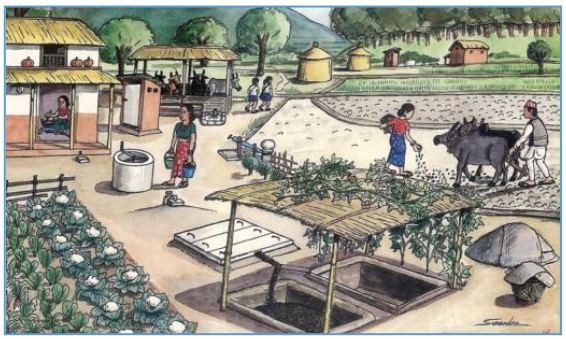
Factsheet-overview by Sjoerd Nienhuys, senior renewable energy advisor SNV

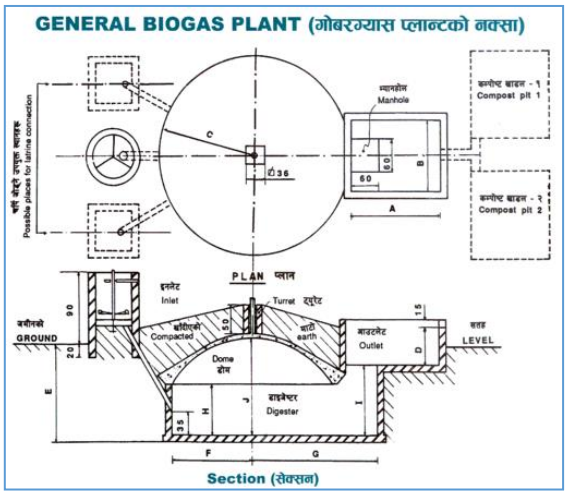
Implementing and Monitoring Agency

SNV-Nepal (Netherlands Development Organisation in Nepal) initiated the Biogas Support Programme (BSP-Nepal) in 1992 to develop Nepal's biogas small-industry sub-sector as a whole. The SNV/BSP office was established to perform core functions in the field of subsidy and fund administration, sector coordination, product development, training of construction companies and quality control.

Programme Duration and Location

BSP Phase-I ended in July 1994. BSP Phase-II ended in February 1997. BSP Phase-III ended in June 2003, having constructed over 100,000 biogas reactors. BSP Phase-IV is planned to extend the SNV support for six more years and subsidise another 200,000 small biogas reactors before June 2009. During this last phase, the BSP office will become separated from the SNV-Nepal office and eventually become a self-sustained sub-sector and small industry support programme. Mechanisms will be developed to continue subsidy for building reactors in remote locations. BSP is a national programme and has successfully installed biogas reactors in 65 out of 75 districts of Nepal, through the training and mobilisation of over 50 biogas construction companies.





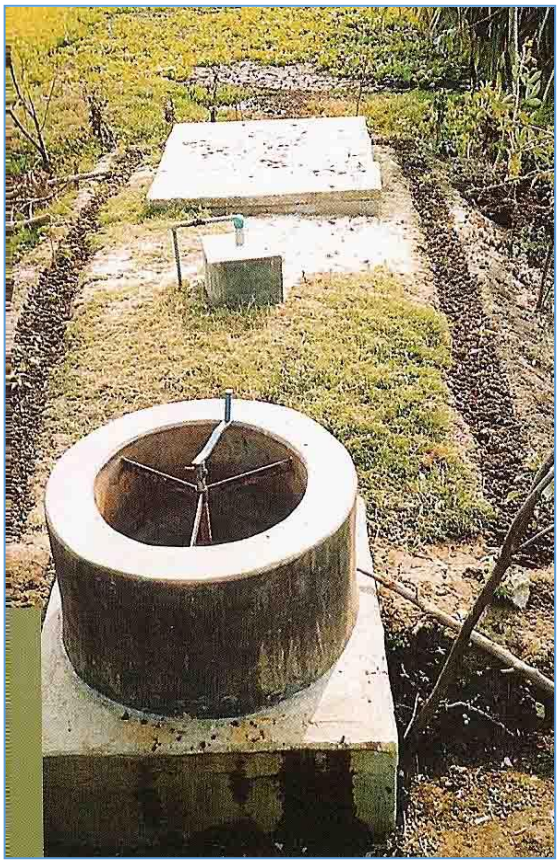
Objectives

The overall objective of BSP-IV is to further develop and disseminate the use of biogas as an indigenous, low-cost and sustainable energy source in rural areas of Nepal. Specific objectives are:

- Develop a commercially viable, market-oriented biogas industry; strengthen and facilitate the establishment of institutions for a sustainable development.
- Increase the number of quality-controlled, small-size biogas reactors by 200,000.
- Ensure the continued operation of all biogas reactors installed under BSP.
- Conduct applied research and development towards local production of components, lower the construction and delivery costs, and increase its operational range at higher altitudes.
- Maximise the economic benefits of the reactors through good use of the biogas slurry as organic fertiliser and better crop production.
- Maximise the social benefits caused by considerable time saved in collecting firewood towards improved childcare and other productive activities.
- Reduce CO_2 emissions, reduce considerably the consumption of firewood by rural families and improve the health situation of farmers' families in and around the house.

- Reduce considerable $CO_{2\text{-equivalent}}$ emissions through the burning of the Methane gas (CH_4 = about 21 times CO_2 greenhouse gas emission value) being generated from the buffalo manure.

- Through Clean Development Mechanisms commercialise the CO_2 emissions reductions and with the funds obtained continue subsidy programmes, outreach and programme monitoring.



Target Groups

All farming families who own at least two bovine and live below the altitude of 2000 meters can have biogas. Technically biogas is an effective and feasible means of cooking and illumination energy for more than 2 million households (50%) in Nepal. Economically biogas reactors can be financed by about 600,000 households with the current design. BSP-IV intends to improve the design and system for high altitudes and access for remote farmers (more than one day's walk from road head).

Implementing Partners

BSP-Nepal implements the programme in conjunction with The Agricultural Development Bank of Nepal (ADB/N), Nepal Bank Limited (NBL), The Rastriya Baniyja Bank (RBB), over 30 local NGOs, about 40 micro-finance institutes, and an increasing number of saving and loan cooperatives for channelling subsidies and credits. Construction of the biogas reactors is realised by approximately 50 biogas construction companies. His Majesty's Government of Nepal (HMG/N) established the Alternative Energy Promotion Centre (AEPC) to coordinate national planning and policy matters in the Renewable Energy (RE) sector. A sub-sector branch organisation, Nepal Biogas Production Group, was established to coordinate the interests of manufacturers.

Funding Sources

The programme is co-funded by HMG/N (22% of subsidy component), the German Development Bank (KfW, 70% of subsidy component) and the Netherlands Directorate General for International Cooperation (DGIS, 8% of subsidy component). KfW provides credit capital through HMG/N. DGIS provides technical assistance through SNV-Nepal. The subsidy component will gradually reduce, while technical assistance to BSP is planned to be phased out by the end of BSP-IV.

Technical Project Information

Biogas is comprised of a mixture of 60% methane (CH_4), 30% carbon dioxide (CO_2) and small amounts of other gases. Cattle dung is mixed with water and digested in small domestic fixed-dome reactors of 4-8m^3 to produce an odourless gas having a smokeless flame. The gas is used mainly for cooking purposes. A gas lamp can also be installed producing light comparable with a 60W bulb.

In practice, 35 kg of fresh dung (3 full buckets or the daily production of 2 buffaloes or cows) produces enough gas for 3 hours of biogas stove use, enough to satisfy the cooking energy needs of a family.

Per household the workload (of mainly women and girls) is reduced by about 3 hours per day, resulting from considerably reduced time otherwise spent on firewood collection, chopping wood and cleaning pots.
Female members of households, after starting to cook with biogas, report significant health improvements, particularly regarding respiratory, gastroenteritis and eye diseases.

It is estimated that each reactor saves about 3000 kg of firewood and 40 litres of kerosene annually. Each reactor contributes to the reduction of greenhouse gasses to the extent of approximately 4.6 tons/year CO_2 equivalent. The biogas reactor saves large amounts of agriculture residue and dried dung cakes from being burned, and produces quality organic fertiliser for the farm.

Results
The BSP changed the institutional landscape of the sub-sector considerably. The number of recognized biogas construction companies increased to 50, with a network of over 250 branch offices in nearly all districts. Likewise, the number of manufacturers supplying the biogas appliances increased to 13. Keeping pace with the growing sector, financial services are now provided by 3 banks and an increasing number of micro-financing institutions. With support of SNV-Nepal, the Alternative Energy Promotion Centre (AEPC) was established as HMG/N's umbrella organization.

The increasing sub-sector capacity has resulted in a steady annual growth of the number of biogas reactors installed. For the 2002/2003 construction year, about 20,000 new reactors were commissioned, bringing the total of subsidised installations under BSP-III to well over 100,000.

To safeguard the investment by the farmer, BSP developed and implements a comprehensive set manufacturing and construction standards, and after-sales-services for biogas reactors. BSP's quality control and management system has resulted in a sub-sector that can claim a rate of effective operation of over 90% on its installations.

Over 1000 masons, after-sales-service technicians, supervisors and junior biogas technicians are trained annually.

Over 20,000 new users (farmer families) are given training on proper reactor operation and fertilizer slurry use each year.

Biogas extension and promotion training is provided to about 1000 technicians per year which includes NGO workers, bank staff, community workers, Village District Commission (VDC) personnel and interested new farmers.

In addition, BSP offers business-counselling services to the involved biogas construction companies in order to improve their management, administration, planning, quality control and implementation activities.

Research

BSP undertakes activities on research and development of gas piping, gas lamps (locally developed and produced Ujeli lamp), gas taps and valves, water drains and stove designs. Except for the main valve, all biogas appliances nowadays are locally produced.

BSP conducts research to lower the cost of biogas reactors and its delivery, improve efficiency of high altitude biogas reactors (insulation and greenhouses), improve the economic use of biogas slurry as a farm fertiliser, and increase the reactor construction efficiency.
BSP furthermore is involved in providing an Integrated Environmental Impact Assessment to obtain Clean Development Mechanism credits for CO_2 reduction and subsequent subsidy finance.

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Farmers, national and international programme staff visiting a biogas farm in Pokhara, Nepal, 2003.

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