

The Biogas Programme in Vietnam; Amazing results in poverty reduction and economic development

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Introduction

It is widely recognized that access to energy services has strong linkages with development. Most rural households in developing countries are forced to draw on traditional biomass materials – wood, charcoal, agricultural residue and animal dung – to meet their daily domestic energy needs. By doing so they not only exhaust these resources, but also pollute the air they breathe at home by burning these substances. They often fall prey to acute and chronic respiratory illnesses. The collection of the traditional fuels devours precious daylight hours that children and women in particular might otherwise spend at school, in income-generating or social activities. In short, the current unsustainable consumption of these traditional energy sources damages not only the biosphere, our greatest reserve of natural capital, but human capital as well.

Domestic biogas: a low-cost, sustainable anti-poverty agent

One very promising approach to fight

poverty and address the urgent energy needs of rural households is the Biogas Practice that SNV – Netherlands Development Organisation has developed for Laos, Bangladesh Cambodia, Nepal and Vietnam. Since 1989 SNV – with financial support from the Netherlands Ministry of Foreign Affairs (DGIS) and the German Kreditanstalt für Wiederaufbau (KfW) - have worked with local partners to develop and carry out large-scale programmes for domestic biogas. The model maximizes the utilization of the energy of the hot combustion gases by prolonging their contact with the maximum surface area of the pot before their evacuation through the chimney. For this purpose a skirt with hoop seals on the top is needed.

SNV adds value

SNV's capacity building activities help to develop a self sustaining biogas market. SNV, together with local partners, supports enterprises and credit institutions with business training and on-site coaching to meet the increasing demand for domestic biogas. This is done in several national biogas programmes, in which it is establish-

ing sound quality control systems and develops appropriate policies to spur this new sector. By now about 200,000 farming households in Nepal and Vietnam tap their biogas plants to meet domestic fuel needs, and many more people will benefit in the near future.

Turning Natural Waste into Safe, Affordable Fuel

Biogas technology is about capturing the gas that results from the anaerobic fermentation of biomass. The plant uses the natural processes of anaerobic digestion to produce biogas from animal dung and night soil. Biogas consists of methane that can be used for cooking and lighting. The trick is to store dung and night soil in such a manner that air cannot enter during the storage. The biogas plants promoted by SNV are simple underground structures of bricks and cement – known as the “fixed dome type” - that last at least 15 years. See a cross section in Figure 1.

Farmers who keep more than two heads of cattle or seven pigs generate enough fuel to meet their daily cooking needs. Larger livestock populations may produce enough energy for further commercial use as well.

Small risks, big gains

The success of the biogas programmes springs from the direct benefits it brings to the daily lives of poor farming households, most importantly cleaner kitchens and the reduction of indoor air pollution. Other benefits also include: money saving, time reduction in searching for fuel and hence more hours available for schooling, productive activities or to socialise. The residue, “bioslurry”, increasingly used as fertilizer, increases agricultural yields and reduces the use of chemical fertilizers and pesticides, therefore increas-

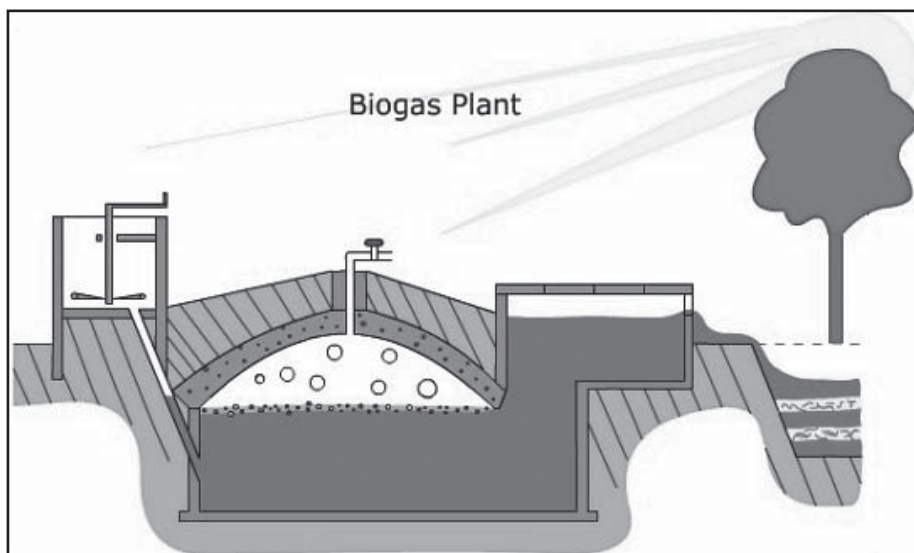


Figure 1 Diagram of a cross section through a Biogas Plant

ing income. On an investment of about 250 Euro, the payback period of a digester is only 2 to 3 years. Apart from the advantages for the household, the use of biogas also improves the quality of the local environment, such as the groundwater, soil and air. These improvements alone, farmers affirm, justify their investment. On a far broader scale, biogas use reduces greenhouse gas emissions, protects forests and stimulates private sector development.

Global warming

Since July 1992 some 165,000 biogas plants have been built in Nepal for families in the rural areas. This has saved an estimated 475,000 tons of firewood and 950,000 litres of kerosene, preventing 700,000 tons of greenhouse gases (GHG) from being emitted in the atmosphere. With 25,000 biogas plants completed by the end of 2006 in Vietnam, the estimated reduction of GHG in this country amounts to 75,000 tons of CO₂ per year. Together this equals the green house gas emission of over 500,000 tourists flying from Amsterdam to Bangkok!

The Clean Development Mechanism (CDM), one of the agreements of the Kyoto Protocol, opens the opportunity to capitalize on green house gas emission reduction (Certified Emission Reductions) and generate revenues. This mechanism will generate funds for the biogas programmes which in their turn will reduce the farmer's investment costs. The Nepal programme has already managed to secure their CERs and the Vietnam programme is on its way to acquire CERs as well.

Table 1 Outputs Biogas Programme Vietnam period 2003 to 2007

Constructed biogas plants	27,000
Number of Provinces	20
Savings on workload/household	1 to 1.5 hours per day
Savings of fuel/household	5 Euro per month
Rural job creation for masons	300,000 labour days
Income masons	2.5 Euro per day
Turnover labour costs	750,000 Euro
Sanitation	40% have now toilets attached to digester

Biogas works in Vietnam

Different domestic biogas digester programmes have been implemented in Vietnam over the past 50 years, but none have aimed at large scale dissemination or long-term operational success. This is despite the fact that conditions in Vietnam are favourable for biogas and that people are interested in the technology because of the obvious benefits that biogas can provide.

Against this background, the Vietnamese and Netherlands Governments agreed on the implementation of a domestic biogas dissemination project in January 2003. The Vietnam Biogas Programme uniquely joins Vietnam's technical knowledge on biogas technology with Netherlands' experience with large-scale dissemination and capacity development. The first phase was successfully completed in January 2006 with the accomplishment of completing 18,000 plants. In 2006 the programme expanded from 12 to 20 provinces and increased the number of installations with another 9,000 (Figure 2 & 3). The planning up to 2011 is to reach about 35 provinces and install a total of 150,000 plants, which will provide 800,000 people with improved energy services (Figure 4). But the programme is about more than

enabling access to sustainable energy services; it also creates jobs, generates economies, and improves sanitation. In table 1 you can find the results from 2003 to 2006.

Goals of the Programme

The overall objective of the project is "to further develop the commercial and structural deployment of biogas, at the same time avoiding the use of fossil fuels and biomass resource depletion". The specific objectives contributing to this overall objective are to achieve economic, environmental and social sustainability, with a specific focus on economics, as the programme has to result in a commercially viable biogas sector supported by independent businesses. This will guarantee the continuation of biogas activities after the programme finishes in 2011.

One of the strategies is to enable biogas builders in becoming (formal) businesses with knowledge on marketing, planning and management. Already many masons take care of advertisement, after sales and management, and work independently from the programme's support; a development that - as long as the quality is to standard - the programme welcomes.

A technology that works

A technology may be right on the drawing table and it may even have been proven to work in some developing countries; but this does not guarantee successful dissemination in other localities. Successful large-scale dissemination depends on the interaction of a chain of actors from management to household level, and involves many factors. One weak link can frustrate the balance between supply and demand, either within the programme's group or outside its scope. An analysis of the



Figure 2 Construction of a biogas plant (photo: Biogas Programme Vietnam)



Figure 3 A completed biogas plant, only a small part of the plant is visible above ground (photo: Biogas Programme Vietnam)

situation in Vietnam is made next.

In the context of Vietnam, dissemination of a product heavily depends on the support of the public sector; lobbying and good communication are paramount. The Ministry of Agriculture, under which the programme resides, has proven to be a great supporter in achieving the goals of the programme and tries to commit other Ministries to facilitate its endeavours. Also, high-level support from the Netherlands and international donors has helped the programme grow.

A nationwide implementation programme like this one is too big to control centrally and therefore decentralisation of tasks and responsibilities is required. Through extensive meetings and training at provincial and district level, awareness and capacity building is enhanced, and by sharing responsibilities all feel more responsible in their role. Provinces have to pay a financial contribution to join the programme and so to prove their commitment.

Another critical factor for successful dissemination are the masons who actually build the biogas plants and are responsible for providing high quality services. By regular quality control, workshops, refreshment training, and even through competitions organised by the programme, all mason teams are trained to a high professional level.

Eventually households (customers) are the ones who decide whether to purchase a biogas plant or not, and in

doing so they define the demand for a biogas market. According to our survey, the environmental benefits, like smell and pollution, are the main incentives for buying a digester, whereas money savings also help to increase popularity. In rural Vietnam awareness and information diffusion progress mainly by word of mouth and through meetings held at the communal level. After exchanging positive experiences, it becomes clear that purchasing a biogas plant is a good investment.

Challenges in the future

So far, clients seem very satisfied with the progress and achievements of the Biogas Programme Vietnam. Recently, the programme has won the prestigious international price for sustainable development programmes, the ENERGY GLOBE AWARD.

However, ample room for improve-



Figure 4 The biogas plants provide houses with improved energy services (photo: Biogas Programme Vietnam)

ments remains. The focal point for the coming period is securing high quality services. Where demand is high, quantity may compromise quality, and therefore the Biogas Programme puts in a lot of effort to ensure that quality and reliability are the starting points of any biogas activity in Vietnam.

The programme is treading new roads in trying to secure possible CDM revenues. Biogas plants indeed reduce GHG emissions, but complying with rules and regulations proves to be complicated; energy and manure related data for each and every household has to be collected. A possible threat is that monitoring costs will be higher than the benefits, a problem that is shared with many small decentralised energy projects applying for CDM. Innovative solutions are required to enable CDM flows to reach poor households in rural Vietnam.

In terms of economic sustainability the development and strengthening of the private sector is a challenge that will increasingly be at the centre of the programme's attention. This will require cooperation and willingness of both the public and private sectors, in which SNV will play a strong facilitating and advisory role.

We hope to inform you about more interesting progress and challenges in the period ahead. For more information please visit: www.biogas.org.vn and feel free to contact us for any information.

Profile of the author

SNV is a Netherlands-based, international development organisation that provides advisory services to nearly 1800 local organisations in over 30 developing countries to support their fight against poverty. With a background in energy and poverty issues, Bastiaan Teune has worked for 1.5 years as a SNV advisor to facilitate the Biogas Programme in Vietnam and contributes to create innovative approaches and by linking actors together to the benefit of better biogas dissemination.