Code: BDGP04

Potential Good Practice Note

Lighting up Lives - Biogas from Poultry Litter as a Sustainable Energy Resource

REGION : South Asia
COUNTRY : Bangladesh
DISTRICTS : Gazipur and Tangail

SOUTH ASIA
Pro Poor Livestock Policy Programme
A joint initiative of NDDB and FAO

Lighting up Lives - Biogas from Poultry Litter as a Sustainable Energy Resource

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1. Introduction

Over the last three decades, the poultry sector in Bangladesh has grown at an annual rate of almost 4.2%. The 150,000 commercial poultry farms (broiler and layer farms) and 130 parent stock farms in the country are today estimated to contribute about 1.6% to the country's GDP. Over six million people find employment, directly or indirectly, in the poultry sector, including about 89% of rural households and around 2.4 million rural women, who depend on backyard poultry farming as their main source of livelihood.

Although the poultry industry plays a key role in the Bangladesh economy, particularly in the rural economy, it also poses a huge threat to the environment since almost 2.3 million tons of poultry manure and 0.2 million tons of litter (faeces with bedding material) are produced daily from a total of 42 million chicken—the number of birds alive at any given time in the country (Waste Concern, 2005). Improper management and utilisation of manure and inappropriate disposal of litter may contribute to environmental degradation, and ultimately be detrimental for human and animal health.

This Potential Good Practice (GP) showcases the joint effort of communities, Non Government Organizations (NGOs) and government agencies in setting up and running eco-friendly biogas plants, using the available poultry litter, and thereby providing a cheap source of energy to rural households, resulting in positive economic, environmental and health returns.

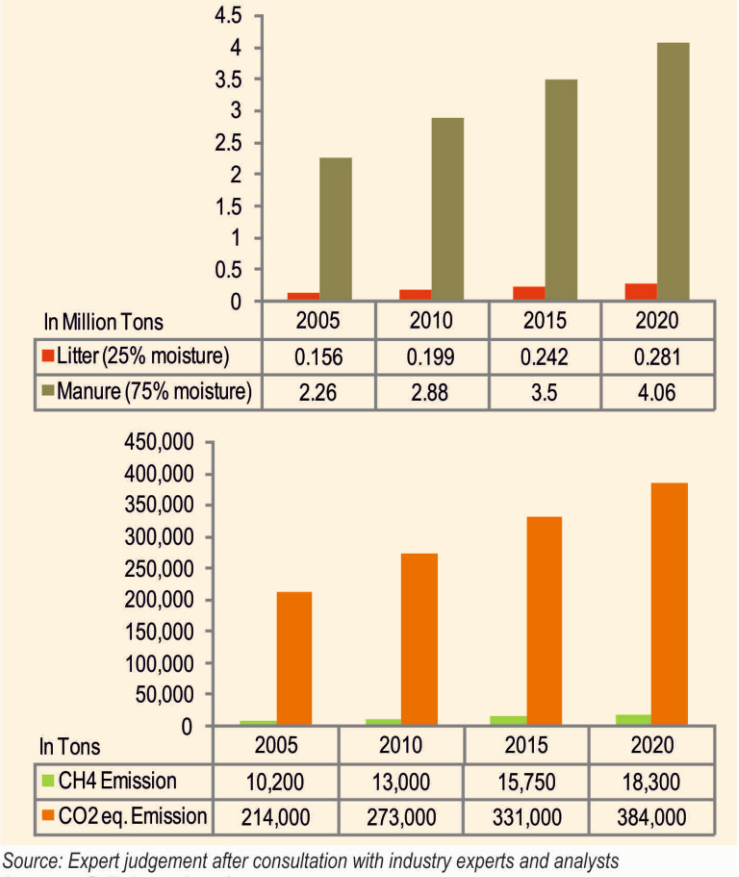
Conventional biomass energy sources (wood, crop residue and dung), which are traditionally used for domestic cooking and in small rural industries, satisfy about 60% of the total energy demand of the country (Islam et al, 2005). Only 14% of the total land area of the country is covered by forest; wood is not available in most rural areas and about 90% of fuel is produced from crop residue and dung. The energy produced is, however, insufficient, and currently there is a supply imbalance of electricity of around 6,000 MW per day in the country. This Potential GP illustrates how the biogas generated from poultry litter can be an effective source of energy for rural households. It is estimated that the available poultry litter in the country would suffice to establish about four million biogas plants, thereby contributing to increased energy supply (Annexure 1).

2. The Origin

The Bangladesh Association for Social Advancement (BASA) is an NGO working on issues of sustainable development, environment, poverty alleviation and empowerment of the poor since 1991. In particular, BASA has imparted training to beneficiary households in a variety of income generating activities, with special emphasis on poultry and cattle rearing so that farmers can establish small to medium, self-sustainable livestock enterprises.

In the medium and relatively larger enterprises, it became increasingly evident that farmers had difficulties in managing poultry litter and cow dung properly. The negative impact on the environment was not understood or appreciated by beneficiary households. According to a report by Waste Concern in 2005, CDM Project - Potential in the Poultry Waste Management Sector in Bangladesh, about 0.2 million tons of litter (from broilers) and 2.3 million tons of manure (from layers) were generated by poultry farms producing about 10,200 tons of methane gas and 2,14,000 tons of carbon dioxide. Projections are also presented for 2010, 2015 and 2020 (Figure 1).

Figure 1: Projections of Poultry Litter, Manure and GHG Emissions



In Million Tons	2005	2010	2015	2020
Litter (25% moisture)	0.156	0.199	0.242	0.281
Manure (75% moisture)	2.26	2.88	3.5	4.06

In Tons	2005	2010	2015	2020
CH4 Emission	10,200	13,000	15,750	18,300
CO2 eq. Emission	214,000	273,000	331,000	384,000

Source: Expert judgement after consultation with industry experts and analysts (wastecon@dhaka.agni.com)

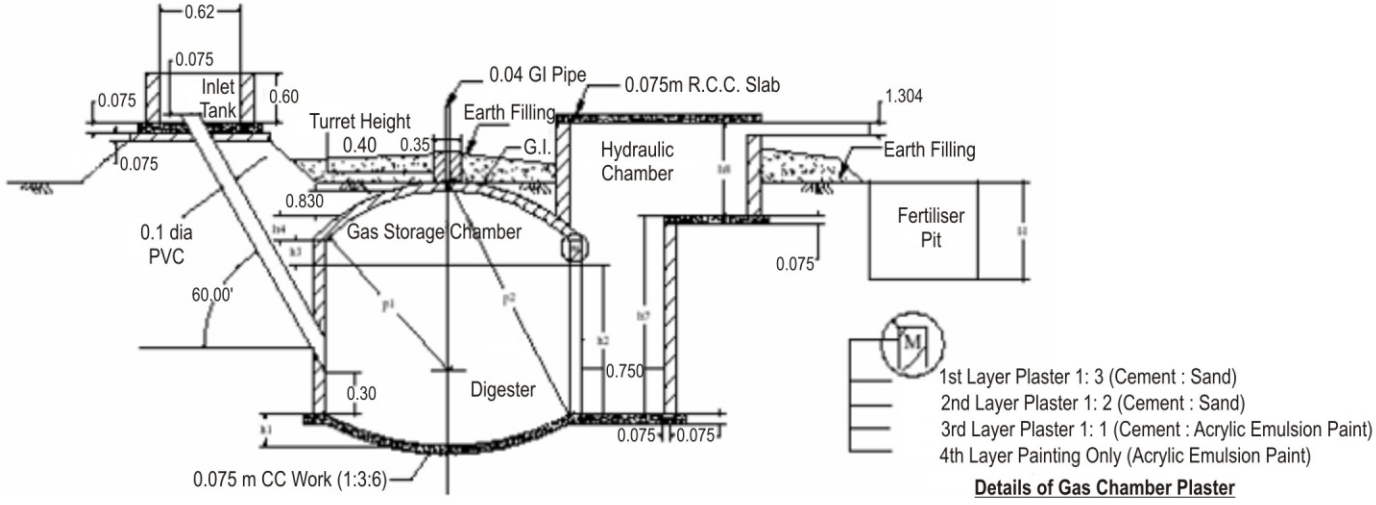
Traditional ways of litter/manure disposal are not feasible on a large scale in Bangladesh (inadequate land available for dumping manure/litter and for organised composting; very few fish farmers buy poultry waste to grow algae in fish ponds, etc.); therefore, BASA realised that there was a good opportunity for developing biogas plants by making use of the available manure/litter from poultry, and producing methane gas and manure from the slurry, thereby reducing energy shortage and household expenditure on fuel and manure.

In order to promote the construction and utilisation of biogas plants in rural areas, BASA established a partnership with the Infrastructure Development Company Limited (IDCOL), set up by the Government of Bangladesh (GoB) in 1997 as a non-banking financial institution (NBFI) with the objective of bridging the financing gap for developing medium- and large-scale infrastructure and renewable energy projects in the country.

Over the period 2006–10, IDCOL aimed at establishing about 60,000 biogas plants in

Bangladesh under the National Domestic Biogas and Manure Programme (NDBMP), with the ultimate goal of creating a sustainable and commercial biogas sector in the country. IDCOL promotes a fixed dome design biogas plant, which is basically of two types: (i) a design that uses cattle dung and human excreta, and (ii) a design that uses poultry droppings. Each of these two models has six sizes of plants of different capacities, ranging from 1.2 to 4.8 cu m. The larger biogas plants provide cooking gas to multiple households whereas the small plants cater to the needs of individual households. IDCOL provides BDT 7,000, irrespective of the size of the plant, as investment subsidy to each household that installs biogas plants as per the specifications and standards set by IDCOL (See Figure 2).

Figure 2: IDCOL Biogas Plant Design



Source: IDCOL / SNV (2006) Implementation Plan. National Domestic Biogas & Manure Programme in Bangladesh IDCOL / SNV, Dhaka

IDCOL does not implement the NDBMP directly but does so through partner organisations (PO), which include NGOs and micro-finance institutions (MFIs). BASA is one of the NGOs, partnering with IDCOL to build biogas plants in rural Bangladesh.

3. The Practice

In the districts of Gazipur and Tangail, BASA organised a number of awareness programmes and information campaigns, both on the hazards of indiscriminate litter disposal as well as the potential economic benefits of installing biogas plants, which include clean cooking gas and gas for lighting that can either be used within the home or sold if required. In addition, the slurry produced can be used as manure for crop cultivation. Biogas plants also have the potential to reduce negative environmental effects of improper waste disposal and the resultant soil pollution and bad odour. The construction of biogas plants also provides an employment opportunity to village masons and labourers.

BASA organised a number of workshops in which representatives of relevant government departments, farmer groups, women leaders and representatives of other NGOs and CBOs participated. BASA targeted two types of households:

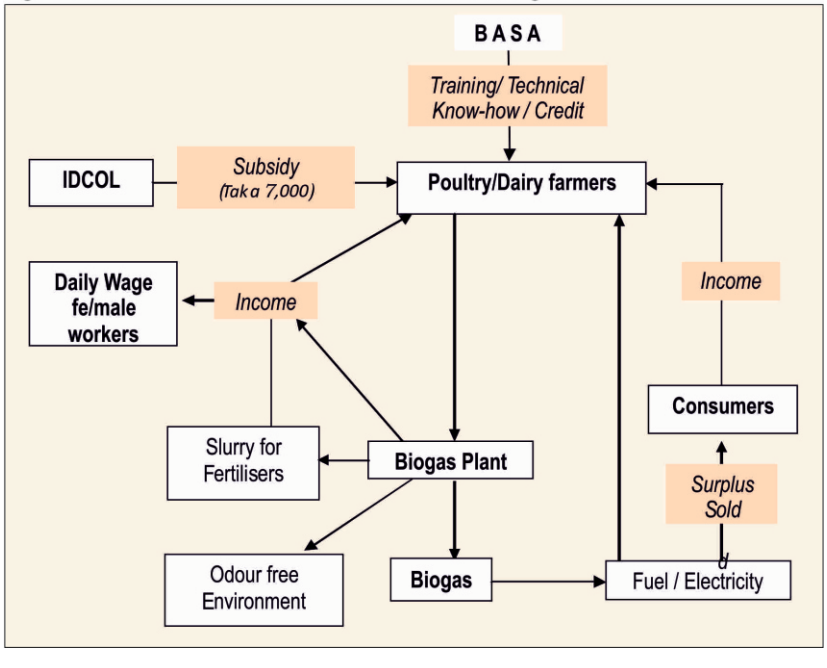
- Households with small-sized poultry flocks (ranging from 50 to 200 birds) and dairy farm owners (owning 2 to 4 cattle heads), that would have long-term interest in setting up biogas plants, on account of the easy and regular availability of animal waste on farms.
- Groups of women, who collectively hold a sufficient number of poultry birds to justify investment in a biogas plant and are willing to share both the investment costs, labour required and output (methane gas and manure from slurry). These groups are expected to form co-operatives in the future so that they may function under certain by-laws/rules.

All potential beneficiaries, including individual households and group members must also participate in some of BASA's micro-credit programmes. By doing so, BASA will ensure the provision of effective technical assistance to farmers, with limited additional costs related to information dissemination and awareness creation.

When households/group members appreciate the value of biogas plants, BASA provides training and technical assistance to individual households and women's groups to both build and manage the plant. Grants for construction are provided by IDCOL.

In the beginning, BASA found it difficult to convince farmers of the potential value of biogas plants; so much so that, in 2005, only one biogas plant was constructed in Gazipur district. In 2006, another ten

Figure 3: Role of Stakeholders and Benefits from Biogas Plants



were built and, by the end of 2008, BASA had managed to help establish 41 biogas plants. Of these, 25 have been established by individual households and 16 by women's groups, comprising at least five women members (Refer also to Table 1).

Table 1: Year-wise Breakup of 41 Biogas Plants Setup by BASA

Year	No. of Biogas Plants Constructed
2005	1
2006	10
2007	15
2008	15

4. Economic Analysis of Biogas Plants

4.1 Investments and Management

As indicated, biogas plants making use of poultry droppings can be of six different sizes (1.2, 1.6, 2.0, 2.4, 3.2 and 4.8 cubic metres), depending on the availability of litter/manure. The total cost for installing a biogas plant, including the cost of material, stove cost, labour fee and so on, varies from plant to plant. In general, a small biogas plant requires an initial investment of BDT 17,000 which goes up to BDT 25,000 for a large biogas plant. Table 2 presents the detailed costs for constructing a 2.4 cu m biogas plant.

Table 2: Investment Costs for a 2.4 cu m Biogas Plant

Cost of Construction Material		
Items	**Quantity**	**Amount in BDT**
Bricks	1,200	6,000
Sand	2 cu m	1,000
Brick Chip	0.55 cu m	1,200
Cement	16 bags (a bag contains 50 kg)	4,160
Rod	17 kg (10 mm)	1,000
Acrylic Emulsion Paint	1 litre	100
Teflon Tape	3 rolls	100
GI Cable	1.5 kg	100
Polythene	3 meters	100
	Total Material Cost	***13,760***
Labour Costs		
Skilled Mason	1 for 10 days	2,500
Semi-Skilled Mason	1 for 10 days	1,500
Labour	1 for 16 days	1,200
	Total Labour Costs	***5,200***
Pipe Fittings & other tools		4,000
	Total Cost	**22,960**

IDCOL provides BDT 7,000 for installing a biogas plant whereas the remaining amount is contributed by the plant owner or by BASA through its credit programme, wherein beneficiaries are expected to repay their loan in three years.

Biogas plants are very easy to set up because they do not require much space. Normally 10–15 days are required to construct a biogas plant. The first time the plants are charged, large amounts of raw material (poultry litter/cow dung) are required; 10–12 days are required to collect this.

Box 1- Installing a Biogas Plant

Step1: The layout of the plant is marked on the ground, and earth digging is initiated. This takes one to two days, according to the size of the plant.
Step2: The bottom of the dome, the outlet passage, the slab of the hydraulic chamber and lintel are plastered. This is completed in one day.
Step 3: Work for making the digester and outlet passage begins and the inlet pipe is set.
Step 4: When the digester and outlet passage are constructed, the wall lintel is set.
Step 5: Construction of the dome starts and the plastering of the hydraulic chamber is done.
Step 6: Construction of the dome top continues while the wall of the hydraulic chamber is being completed.
Step 7: The construction of the dome top continues on the following day; the plaster of the hydraulic chamber and setting up of the centre pipe and turret are done alongside.
Step 8: The work of the dome gets completed on the fourth day and the work on the inlet and the digging of the slurry well begins.
Step 9: The setting up of the centre pipe and turret and 1st, 2nd, and 3rd layer of the inside of the top of the dome is completed.
Step 10: The 4th and 5th layer of the inside top of the dome and plastering of the pipe line in the outlet, water drain and burner are set.
Step 11: The 6th and 7th layer of the inside dome is done, as also the plastering of the outside of the dome and the filling of earth around all sides of the plant.
Step 12: The top of the dome is covered by at least 25 cm of earth. If this earth is removed by rain water, it should be piled up again. The piling of earth over the dome is necessary to maintain the temperature of the digester, as also to save the dome from external damage, to maintain continuous flow of gas during winter and to save the dome from internal gas pressure. The land over the dome can be used for vegetable cultivation.

On an average, a 2.4 cu m biogas plant requires 34 kg of poultry litter (from about 350 birds) and 68 litres of water (or 65 kg of cow dung and an adequate amount of water) daily to function properly. About 80–90 kg of slurry is produced, which can be used as compost fertiliser, and 5–6 hours continuous gas supply is available for lighting and cooking daily. (See also Table 3)

Table 3: Inputs Required for Operating a Biogas Plant

Gas Chamber size (cu m)	Gas Stove Burning Time (hrs)	Cow Dung required per day (kg)	No. of Cows		Poultry Litter required per day (kg)	No. of Poultry
1.2	2 - 3	30 / 35	4		17	200
1.6	3 - 4	40 / 45	5		23	250
2.0	4 - 5	50 - 55	6	OR	28	300
2.4	5 - 6	60 / 65	7		34	350
3.2	6 - 8	80 / 85	10		45	450
4.8	10 - 12	120 / 130	14		70	700

Source: IDCOL Model of Biogas Plant, April 2007

4.2 Benefits

Both monetary and non-monetary benefits are generated by a biogas plant, the former being crucial for farmers to have incentives to invest time and money in building and managing these plants. Monetary benefits include reduced expenditure on or income from the sale of gas for cooking or lighting, and fertiliser (slurry), provided by the biogas plant. It is estimated that the monetary benefits generated by a biogas plant can offset the initial investment costs within five years. Box 2 presents a case study from BASA's experience related to biogas construction in Gazipur district.

Box 2: Cost and Benefits of a Biogas Plant in Pazulia Village, Gazipur District—Nazma Begum's story

Following a dialogue with BASA, Nazma and her husband were convinced of the importance of building a biogas plant to make use of the available poultry litter from their small poultry farm consisting of 200 birds. This would allow them to reduce expenditure on fuel for cooking and lighting, overcome the strong odour on the poultry farm, and allow Nazma to cook in a smoke free, clean environment. Nazma attended one of the training courses held by BASA and built her own plant. A simple cost-benefit analysis reveals the rewarding investment that Nazma and her husband have made. The total material and labour costs to construct the biogas plant amounted to almost BDT 23,000, but each month the biogas plant provides Nazma with a net income of BDT 1,000, including gas valued at BDT 400, lighting valued at BDT 200, and slurry valued at BDT 400. In about three years, therefore, Nazma has retrieved her initial investment. Biogas projects are, therefore, highly bankable. Following Nazma's example, other members in the village are now keen to set up their own biogas plants.

At the household level, the use of biogas results in: (i) improved sanitation due to its connection to toilets, (ii) proper management of poultry litter, (iii) a smoke-free environment within the home when cooking (the smoke from traditional earthen stoves, in fact, is extremely hazardous to the human lungs and eyes, especially for young children) (iv) saving of time since food cooks more quickly with biogas than with traditional fuels (v) reduction in labour and drudgery, particularly for women, who often have to spend long hours collecting fuel wood and straw for cooking, and reduction in the effort required for cleaning utensils[1]. Overall, it is estimated that biogas usage saves approximately an hour per day per family (vii) finally, the training provided for setting up and maintenance of biogas plants has led to a gradual empowerment of the beneficiaries, particularly women, who are now able to voice their opinions and views within the household.

Box 3: The Direct Benefits Derived from Biogas by Women

☼Smoke-free fuel reduces indoor air pollution, which adversely affects health, particularly of women.

☼Income Saving: The increasing price of kerosene, diesel and other conventional energy sources like firewood make biogas technology an attractive alternative for many rural women.

☼The use of organic fertilizer from poultry litter to grow vegetables in homestead areas enhances income by 30–50% and provides vegetables to supplement the household diet.

☼One to two hours are saved per day from fuel collection and relief from manual labour involved in the process.

Source: A.H.M. Mustain Billah, 2008, Biogas for Women's Empowerment

At the community level, and in society as a whole, a biogas plant reduces the emission of green house gases (GHGs), for instance, one plant of 2.4 cu m makes use of about 2.4 tons of biomass per year, thereby reducing the amount of carbon released by burning biomass and conserving forest resources. In addition, there is reduction in the odour as well as health risks associated with viruses in improperly stored/managed litter or manure.

[1]Utensils get a thick layer of soot when put on traditional stoves using twigs, cow dung cake etc. This entails vigorous cleaning requiring both time and effort by women.

5. Conclusion

Small-scale biogas plants are popular in rural areas of Bangladesh because a majority of the rural households keep some birds and many are small-scale commercial poultry producers. The expansion of the biogas programme represents an opportunity to satisfy the growing and unsatisfied demand for energy in the country.

Sustainability is dependent on the backward and forward linkages that are established, both with suppliers of litter/manure and buyers of energy/fertilisers. Feasibility studies on *Biogas from poultry droppings* carried out by the Bangladesh Centre for Advanced Studies (BCAS) and Electrochemical Society (ECS) report that biogas plants have a durability of more than 20 years and, recommend that the establishment of biogas plants should be made mandatory for all poultry farms with more than 100 birds. This would ensure financial self-sustainability of the biogas plant.

In Bangladesh, however, biogas plants faced a setback in 2007 and 2008 due to outbreak of avian flu. Around 60,000 poultry farms closed down and thousands of poultry birds were culled to contain the epidemic. The situation has been improving since 2009 and it is expected that biogas plants will again get a boost as an alternative source of energy and income in rural and peri-urban areas. For this to happen, however, decision-makers and development practitioners should take into account that:

- The majority of the rural population is still unaware about biogas plants and its numerous uses.
- It takes time for a market for biogas products to develop.
- Despite the fact that biogas plants are largely bankable, some form of government support is necessary to promote their spread—either directly or through establishing public-private partnerships—because of the typical resistance of private companies to deal with smallholder fe/male farmers. The establishment of IDCOL by the government is a step in this direction, paving the way for similar initiatives that provide direct benefits to smallholder farmers.
- A number of exogenous shocks may affect the profitability/viability of biogas plants, including regular monsoon flooding and high water levels; outbreaks of animal diseases, etc.

On the whole, there are tremendous opportunities for the development of small-scale biogas plants in Bangladesh but a number of other institutional and economic constraints need to be consistently addressed if a market has to develop for biogas using poultry litter. A beginning has been made by the government in the National Poultry Development Policy (2008), by which support from the government has been committed for any institution or individual, who takes up initiatives for the safe and eco-friendly utilisation of poultry litter. This policy commitment needs to be translated into sustainable action, such as improved information dissemination regarding the benefits of biogas plants, training based on the knowledge base and priorities of small-holder poultry rearers, particularly women, and availability of credit and loans for the construction of biogas plants.

References

Bangladesh Infrastructure Development Company Ltd (IDCOL). 2006. Annual Report.

Billah A.H.M. Mustain. 2008. "Biogas for Women Empowerment". Bulletin 804. Ohio State University. http://ohioline.osu.edu/b804/804_4.html

Department of Livestock Services, Ministry of Fisheries and Livestock, Government of the Peoples Republic of Bangladesh. 2006

Islam R., Islam M.R., Beg M.R.A. 2006. "Renewable Energy Resources and Technologies Practice in Bangladesh" The Journal of Environment & Development September 2008 17: 292-315

Ministry of Energy and Mineral Resources, Government of the People's Republic of Bangladesh, November 2004. 'Private Sector Power Generation Policy of Bangladesh'

http://www.powercell.gov.bd/images/additional_images/PSEPGPB.pdf

M. Rofiqul Islam, M. Rabiul Islam and M. Rafiqul Alam Beg, "Poultry Manure Management and Utilisation—Problems and Opportunities". Renewable and Sustainable Energy Reviews Volume 12, Issue 2, February 2008, Pages 299-343 http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VMY-4M05GYF-1&_user=10&_rdoc=1&_fmt=&_orig=search&_sort=d&_docanchor=&view=c&_searchStrId=1048946044&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=619cb2548e270ed22005e3cdfbd31aea

Rahman- M. 2009. "Composting Poultry Manure: An Effective Strategy to Reduce Environmental Pollution". Bangladesh News, Saturday, 22nd August 2009, http://www.independent-bangladesh.com/letters/composting-poultry-manure-an-effective-strategy-to-reduce-environmental-pollution.html

Annexure 1

Biogas plants in Bangladesh have a long history. The first Indian KVIC (Khadi and Village Industries Commission) 'floating-drum biogas plant' was built in 1972 at the Bangladesh Agriculture University (BAU), for research and study purposes. The technology is very simple and user friendly. A plant comprises an inlet tank, a digester (that is, an underground chamber or mechanised drum in which various anaerobic bacteria convert organic waste into methane gas), an outlet tank and a gas distribution system. Similar plants were then built in Phulpur in Mymensingh district for cooking and lighting purposes.

In 1976, a family-size, KVIC-design biogas plant was built at the premises of the Bangladesh Council of Scientific and Industrial Research (BCSIR) by the Institute of Fuel Research and Development (IFRD), followed by a plant at the KBM College in Dinajpur in 1980. From 1981 to 1994, different agencies such as IFRD, Environment and Pollution Control Department, Local Government Engineering Department (LGED), BCSIR-DANIDA, the Department of Livestock and the Dhaka City Corporation built a few hundred biogas plants, using the Indian KVIC floating drum model, Chinese fixed dome plant, bag type digesters with cow-dung, household waste, water hyacinth and human excreta as raw material.

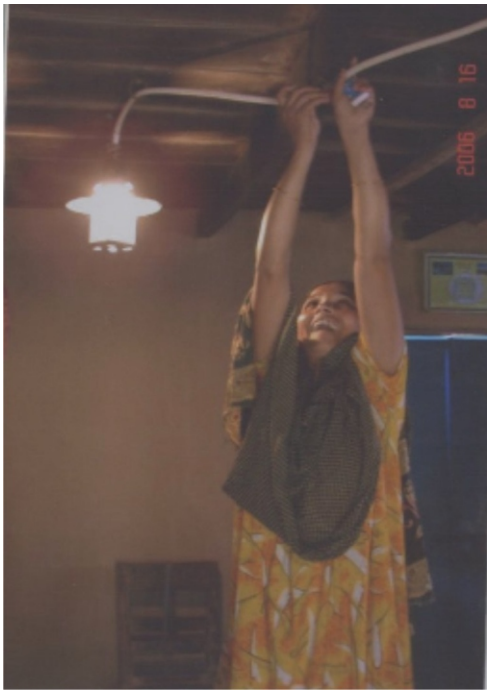
In 1994, LGED constructed a biogas plant at Uttar Khan, Dhaka, which was followed by a wider dissemination of biogas plants. About 25,000 small biogas plants were then set up, with the initiative of LGED, BCSIR and IDCOL; farmers were given financial grants of about BDT 7,000–7,500 per plant for construction. Recently, Grameen Shakti (GS), an NGO, started promoting biogas plants on market-based principles, following evidence of positive returns of biogas production to rural communities. GS does not provide subsidies to farmers but gives technical assistance and arranges for soft loans; 120 such plants were constructed by December 2005. The objective was to set up 200,000 biogas plants within a period of five years (IDCOL, 2006).

Abbreviations

BASA	Bangladesh Association for Social Advancement
BAU	Bangladesh Agriculture University
BCAS	Bangladesh Centre for Advanced Studies
BCSIR	Bangladesh Council for Scientific and Industrial Research
BDT	Bangladeshi Taka
CBO	Community Based Organisation
CDM	Clean Development Mechanism (http://cdmbangladesh.net/)
DANIDA	Danish International Development Assistance
DLS	Department of Livestock
ECS	Electrochemical Society
GDP	Gross Domestic Product
GoB	Government of Bangladesh
GP	Good Practice
GS	Grameen Shakti
HH	Household
ICDDRB	International Centre for Diarrhoea Disease and Research in Bangladesh
IDCOL	Infrastructure Development Company Limited
IFRD	Institute of Fuel Research and Development
KBM College	Kamala Bezbarua Memorial College of Teacher Education
KVIC	Khadi and Village Industries Commission
LGED	Local Government Engineering Department
MFI	Micro Finance Institutions
NBFI	Non-banking Financial Institutions
NDBMP	National Domestic and Manure Programme
NGO	Non Government Organisation
PO	Partner Organisation
SNV	Netherlands Development Organisation

Photo Gallery

Photo Gallery



The NDDB-FAO **South Asia Pro-Poor Livestock Policy Programme** (SA-PPLPP) is a unique livestock development program that aims to 'to ensure that the interests of poor livestock keepers are reflected in national as well as international policies and programs affecting their livelihoods'. It endeavors to do so by a) creating spaces for and facilitating dialogue among the actors playing a direct and indirect role in the livestock sector of South Asia, and b) drawing from and using lessons from field experiences to influence livestock-related policies, programmatic and institutional changes towards the benefit of poor fe/male livestock keepers in the region.

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BASA is a voluntary non profit and people oriented socio-economic-cultural development organization which is committed to poverty alleviation. It has diversified development activities based on current assessment of its working area. To optimize project impact, BASA implements programs through an integrated and sustainable development approach, providing counterparts and other support activities if needed. It follows a principle of ensuring a sustainable way of life in developing self-reliant communities.

BASA maintains it's Head Office in Dhaka while local offices (45) are spread across the Upazillas and Villages of Tangail, Gazipur, Mymensingh, Narayangonj, Norshingdi, Jamalpur and Dhaka Districts. Three hundred and seventy five (375) dedicated and committed staff is currently working in the Head and Branch Offices.

For more information on BASA, kindly visit their website at http://www.basango.org/

About this Potential Good Practice

With the objective of facilitating the proper management and safe disposal of poultry litter, the Bangladesh Association for Social Advancement (BASA), an NGO, promoted the setting up of poultry litter based biogas plants, in the districts of Gazipur and Tangail. These initiatives contributed to the sustainable management of poultry litter, and an odour free environment and also generated biogas, a green fuel for household consumption, and slurry to be sold as manure.

This Potential Good Practice showcases the joint effort of communities, NGOs and government agencies in setting up eco-friendly biogas plants that, by making use of available poultry litter, provide a cheap source of energy to rural households with positive economic, environmental and health returns.

SOUTH ASIA Pro Poor Livestock Policy Programme

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