

SPECIAL CREDIT TO SUPPORT BIODIGESTER CONSTRUCTION

Basic Information Table

Case Name	Special credit for biodigester construction
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Sector	Biodigester, biogas and fertilizer
Initiation Date & Duration	March 2006-December 2012
Location	Cambodia, provinces of Kampong Cham, Kandal, Svay Rieng, Takeo, Kampong Speu, Kampong Chhnang, Kampot and Prey Veng.
Funder(s)	<ul style="list-style-type: none"> - DGIS (SNV): 2.9 Million Euro - BMZ (GTZ): 1.7 Million Euro - MAFF with VER income: 1.2 Million Euro - Farmers: 5.5 Million Euro
Project Initiator	Cambodian government and SNV
Overall Budget (if applicable)	11.3 million Euro
Output	Equivalent to 2 PDD or 10 MWh
Area of Land (if applicable)	Size of land for building biodigester is 3m x 8m
Beneficiaries	Numbers – Group – Benefit <ul style="list-style-type: none"> - Direct beneficiaries: 110,000 Farmers - Saving USD144/Y/HH from buying firewood and kerosene

Abstract

The lead institution for the National Biogas Program (NBP) in Cambodia is the Ministry of Agriculture, Forests and Fisheries (MAFF). During the first 15 months of the program 6,400 digesters were installed. For the consumers the potential benefits of participating in the program are multiple and include: a) a household saves up to USD 12 per month compared to buying other sources of energy, b) the bioslurry left over from generating the biogas is used as fertilizer in the agricultural production, c) improved health aspects in regards to cooking and d) time savings from what use to be dedicated to collecting wood and cleaing kitchen utilities. At a wider level, the use of biogas can contribute to reduced deforestation and climate change mitigation as an average household in the program now consumes 2,200 Kg less of firewood at an annual basis.

One prominent obstacle to the dissemination of biogas digesters in Cambodia is the lack of cash among farmers, combined with absence of affordable credit products. The NBP has therefore partnered with financial institutions (such as FMO, PRASAC-MFI and Amret MFI) to design a special credit scheme that provides funding for the biogas investment to household that otherwise could not afford to participate in the program.

Context

The overall objective of the first phase of the NBP (2006-2012) is the establishment of a permanent domestic biodigester sector, operating on a commercial and market-oriented basis. The dissemination of biodigesters will lead to an indigenous, sustainable energy source in selected provinces of Cambodia.

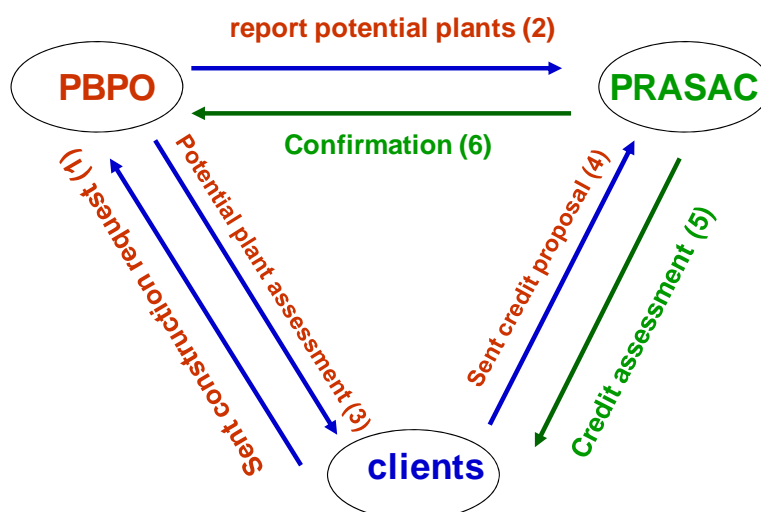


FMO (Netherlands Development Finance Company) commissioned a biodigester credit study in October 2006. The results from this study indicated that over 84% of farmers need special credit to build a biodigester. Therefore, FMO allocated a total soft loan of USD 2 million to PRASAC-Micro Finance Institute in November 2007. Similarly, Amret-Micro Finance Institute was provided a total of USD 1 million in June 2009. From January 2008 onwards all farmers in the NBP provinces have had access to a special biodigester credit, which entails favourable terms compared to regular micro-credit. The terms and conditions for the biodigester credit scheme are as follow:

<i>FMO loan to PRASAC and Amret MFI</i>	<i>PRASAC and Amret loan to farmers</i>
<ul style="list-style-type: none"> ◆ <i>USD 2 million for PRASAC and 1 million for Amret</i> ◆ <i>Loan term 10 years.</i> ◆ <i>Interest rate of 4% p.a. with no additional fees.</i> ◆ <i>Repayment made in 10 semi-annual equal amount.</i> ◆ <i>No Collateral required (Pari passu).</i> 	<ul style="list-style-type: none"> ◆ <i>Loan amount: 150 - 1,000 USD, or 600,000 – 4,000,000 Riel, but not allowed more than the plant cost</i> ◆ <i>Interest rate: 1.2% per month or 14.40% per annum</i> ◆ <i>Loan Term: 4 months or 24 months</i> ◆ <i>Pre-repayment: USD150 subsidy from NBP is the full principal and interest pre-repayment after construction completed</i> ◆ <i>Interest is only calculated on the outstanding amount</i> ◆ <i>Repayment must be done in the MFI office</i> ◆ <i>Repayment modes are flexible ranging from monthly to four-monthly</i> ◆ <i>Need collateral</i>

Method / Intervention

In order to help farmers receive loan, the programme at provincial level has to 1) identify clients, 2) conduct technical assessment (sufficient dung, $\geq 20\text{kg/day}$), and 3) complete a technical assessment form to be sent to MFI. Upon receiving the completed technical assessment, the MFI will do credit/economic assessment which is in compliance with MFI's client criteria especially with regards to repayment capacity, collateral or guarantors. The process to acquire a biogas loan can be summarized in the chart below:



The average size of the loan is USD 500 with the special interest rate of 1.2% per month, a one year term, and the subsidy of USD 150 from NBP. This subsidy is the full principal and interest pre-repayment after the construction is completed. The cost of borrowing/interest comes to USD 35 after 12 months as shown in below table:

Month	Outstanding	Principal Installment	Interest payment	Total Repayment
1	500.00	0.00	0.00	0.00
2	500.00	138.00	12.00	150.00
3	362.00	36.20	4.34	40.54
4	325.80	36.20	3.91	40.11
5	289.60	36.20	3.48	39.68
6	253.40	36.20	3.04	39.24
7	217.20	36.20	2.61	38.81
8	181.00	36.20	2.17	38.37
9	144.80	36.20	1.74	37.94
10	108.60	36.20	1.30	37.50
11	72.40	36.20	0.87	37.07
12	36.20	36.20	0.43	36.63
Total	0.00	500.00	35.89	535.89

Stakeholders, their roles, and relationships

In order to ensure smooth collaboration between the credit providers and constructor of biodigester plant, both MFIs and NBP have signed a MoU for providing special loans to the farmers who construct biodigester plants. Both parties are dedicated to a sustainable rural development, including access to permanent and clean energy sources provided on a commercial basis.

MFI and the NBP cooperate in the provision of biodigester construction credit to entitled farmers and commit themselves to the following:



1. PRASAC or Amret MFI offer a loan to farmers who fulfil the requirements (positive technical feasibility report and credit worthiness) for the construction of a biodigester under the terms and conditions of the NBP. The credit amount has a maximum of USD 1,000.
2. PRASAC or Amret, through its loan officers, actively promote the biodigester loan product among its client base. For this purpose, they develop and distribute information materials like brochures on the technology and its benefices. NBP included credit information in its promotion material.
3. The credit is disbursed in cash only if the farmer is considered credit worthy by PRASAC or Amret and can submit a feasibility form (signed by PBPO supervisor, or mason, or CEDAC promoter or Village Livestock Agent) and a signed construction contract. The plant construction take usually less than 1 month. In case the farmer does not present a plant completion form within a 3 months period after the credit has been disbursed, it can no longer qualify as a biodigester loan but as an regular consumptive loan whereby the interest rate is adjusted accordingly.
4. After completion of the plant, it is inspected by a PBPO supervisor and, if considered in order, the owner receives from a PBPO a Plant Completion Form, signed and stamped. The plant owner will receive a USD 150 subsidy upon presentation of the original Plant Completion Form as well as an identification card or family book at the PRASAC or Amret branch that has disbursed the loan. The amount can be used to repay the loan, generally or the first three month repayment for both principle and interest.
5. Upon receipt of the subsidy amount, the farmer has to sign a bank receipt on which also the plant serial number is mentioned. PRASAC or Amret stamps the original Plant Completion Form with a clearly visible date and location stamp before returning a photocopy to the farmer. At the beginning of each month, bank receipts customer copies will be transferred by PRASAC or Amret to the office of the NBP together with a list of disbursed subsidies.
6. The NBP gave a sufficiently large amount at the PRASAC main office specifically earmarked for subsidy payments. PRASAC or Amret received from the NBP the authority to debit subsidy payments from this account. At regular intervals, depending on the depletion rate and construction forecast, NBP will replenish the account
7. NBP provided to PRASAC a list with the names, signatures and stamp samples of the Directors of the PBPOs who are authorized to sing the Plant Completion Forms. Mutations has to be reported to bank without delay and in accordance with established Bank procedures.
8. Upon request of PRASAC or Amret, the NBP can conduct province wise a biodigester programme introduction workshop for their staff involved in the provision of biodigester credit.
9. All Biodigesters constructed under the National Biodigester Programme have a warrantee on their technical functioning for maximum duration of the loan period being 2 years. NBP guarantees that no plants will be out of use due to technical reasons.
10. PRASAC or Amret and NBP have quarterly meeting to update the work progress and to evaluate the results. Together with the NBP, they are jointly responsible for a sound monitoring of the credit provision.



Outcome/Impacts

For biogas to become a permanent sector, it is necessary to have solid contributions from the farmers. Generally, farmers cover around 70-80% of the total costs of the plant – an amount that will be paid back in 1.8 years (after deducting the subsidy amount granted from the programme). Farmers that are unable to commit the required cash can receive special credit from MFI. Their investment will benefit their household by means of improved cooking arrangements and a cleaner environment. Other advantages include:

- Saving USD12/month/family (USD 8 saving on firewood and USD 4 saving on kerosene and battery charging).
- Saving a minimum of 2200 kg of fire wood per year per household
- Saving a minimum of 50 liters per year of kerosene per household
- Saving about 85 kg of chemical fertilizer per year per household or USD 50
- Reducing CO₂ equivalent to 5.8 tones/year/household
- Saving time of 2 hour/day

The plant design is presently available in five different sizes: 4, 6, 8, 10 and 15 m³. The table below gives the daily required input, gas production and firewood equivalent to different plant volume:

Biodigester size	Daily dung feeding (kg)	Daily gas production (m³)	Use of Biogas Stove (hour)	Use of Biogas Lamp (hour)	Firewood replacement value (kg)¹
4	20 to 40	0.8 to 1.6	3.5 to 4	8-10	4 to 8
6	40 to 60	1.6 to 2.4	5.5 to 6	12-15	8 to 12
8	60 to 80	2.4 to 3.2	7.5 to 8	16-20	12 to 16
10	80 to 100	3.2 to 4.0	9.5 to 10	21-25	16 to 20
15	6000	100-150	100-150	14 to 15	28-32

¹ Based on a commonly used, low tech, woodstove with a 10% efficiency rate. 1 m³ of biogas will replace about 5kg of firewood.

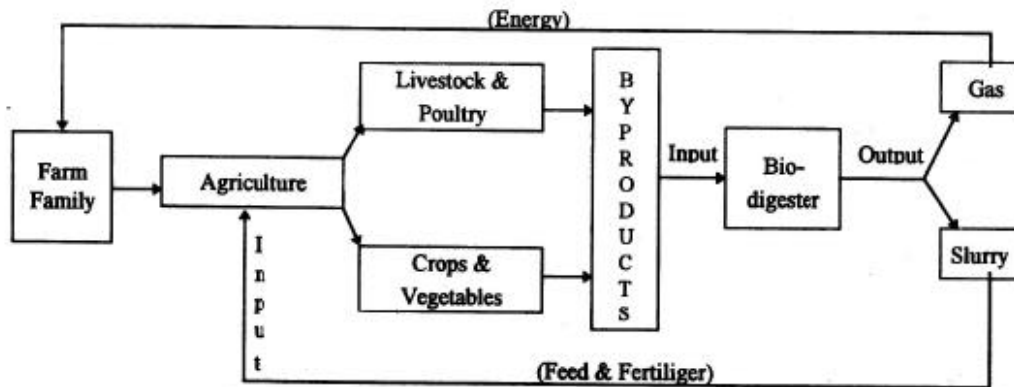


A under-construction biodigester



Biodigester provide energy for cooking and lighting with convenience of cooking and cleaner

Currently, MFI is operating in 8 provinces, where roughly 60 branches and sub-branch offices are involved. There are 2,246 loan plants with USD1,254,160 of loans (average loan size USD 556.74) disbursed by PRASAC MFI from November 2007 until December 31, 2009. 6,400 plants have so far been constructed under NBP. And 95 plants have been established with loan from Amret since September 2009. The diagram illustrates the outputs cycle such as energy for cooking, lighting, and slurry for fertilizer agriculture.



The lessons learned:

The following key lessons were identified during the programme implementation:

- Credit is an indispensable part of the biodigester programme;
- Building community confidence by constructing high-quality plants, coupled with the involvement of a reputed credit provider, are key issues;
- A well-designed loan product for biogas is required – ordinary consumptive loan will not suffice;
- Access to inexpensive sources of funds by the credit provider is imperative, so that they in turn can provide credit to the farmers at a reasonable rate;
- Good communication with beneficiaries (i.e. farmers) about the expected benefits of installing a biodigester plant is of high importance;
- Strong and clear collaboration between project partners (the credit providers PRASAC and Amret, and the constructor NBP) at provincial level is essential.

Challenges

- Securing the credit programme while the biogas programme is in a state of expanding. The Biodigester Programme is growing rapidly with expansions into the provinces around the Tonle Sap Lake and increasing demand in the older programme provinces. Also the current NBP implementation phase has been extended from December 09 till December 12. The resulting increase in demand for credit will require FMO's willingness to increase and prolong its support to the MFIs.
- Biogas credit is seen by the MFIs as non-productive, and therefore as a risk for the creditor. Revenues through fuel cost saving and the use of bio-fertiliser from Biodigesters have to be maximized. Consequently creditors need to be convinced of the biodigester's productive nature otherwise they require a permanent source of income from the farmer.

- Biodigester users should receive proper after-sale service to make sure the biodigester is well operated and maintained. Technical or user failures can disrupt the repayment of credit.
- Need commitment of all stakeholders to solve any unexpected problems. There are four main stakeholders, namely Provincial Biodigester Programme (PBPO) together with the Biodigester Construction Companies (BCCs), MFI (PRASAC/Amret) and Clients (farmers) - as shown in the above chart on page 3. All of these stakeholders have their particular job which has to be done timely and in coordination with the other stakeholders. The procedure is at times disrupted by a time-gap or miscommunication between the officers and the farmers. To solve this, the concerned MFI offices, PBPOs and BCCs will have regular consultation on progress and problems. This should take place at least monthly between PBPO director and MFI branch manager and on a weekly basis between PBPO technical supervisor, BCC managers and credit officers. At the central level there are quarterly meetings between the NBP and the MFIs.
- Capacity of the creditor has to grow with the increasing demand. Based on accumulated experience, there seems to be an inadequate number of credit officers to conduct field assessments because biogas loan assessment is perceived as an additional task for them. To solve this, NBP and the MFIs have regular contact on plant construction planning and the expected proportion of credit plants per province. Thus the creditors can incorporate this into their normal planning of field visits. A complicating factor is the still limited number of MFI branch offices in the NBP in target provinces.