

International Workshop on Financing of Domestic Biogas Plants

**October 22-23, 2008
Bangkok, Thailand**



Proceedings

**Netherlands Development Organisation
(SNV)**

January 2009

Table of Contents

ABBREVIATIONS	3
1. INTRODUCTION	4
2. BACKGROUND	4
3. OBJECTIVE OF THE WORKSHOP	4
4. SCHEDULE	4
5. PARTICIPANTS	4
6. PROCESS AND OUTCOME	5
6.1 OPENING REMARKS.....	5
6.2 INTRODUCTION OF THE WORKSHOP	5
6.3 PLENARY PRESENTATION ON FINANCING OF BIOGAS PLANTS.....	6
6.4 PRESENTATION OF COUNTRY PAPERS.....	7
6.5 PRESENTATION ON CARBON CREDIT AND FINANCING OF BIOGAS PLANTS	23
6.6 CLOSURE OF THE PLENARY PRESENTATIONS.....	26
6.7 GROUP EXERCISE ON SWOT ANALYSIS OF INVESTMENT SUBSIDY AND CREDIT.....	27
6.8 PRESENTATION OF OUTCOME OF GROUP EXERCISE.....	27
6.9 CAROUSEL OF STATEMENTS	33
6.10 COUNTRY ACTION PLANS.....	34
6.11 RIVER CRUISE AND FAREWELL DINNER	40
6.12 EVALUATION OF WORKSHOP	40
6.13 CLOSING REMARKS	42
7. CONCLUSION	43
Annex-1: Workshop Schedule	
Annex-2: List of Participants	

Abbreviations

ABP	:	Asia Biogas Programme
ADB	:	Asian Development Bank
ADBL	:	Agricultural Development Bank Limited (Nepal)
AEPC	:	Alternative Energy Promotion Centre (Nepal)
BCR	:	Benefit Cost Ratio
BCSIR	:	Bangladesh Council for Scientific and Industrial Research
BCU	:	Biogas Credit Unit
BPP	:	Biogas Pilot Programme (Lao PDR)
BPD	:	Biogas Project Division (Vietnam)
BPR	:	Banque Populaire du Rwanda
BSP	:	Biogas Support Programme (Nepal)
BSP-N	:	Biogas Sector Partnership-Nepal
CDM	:	Clean Development Mechanism
CER	:	Certified Emissions Reduction
CMI	:	Carbon Market Initiative
CNY	:	Chinese Yuan (1 US\$=6.8 CNY)
DGIS	:	Directorate General for International Cooperation (The Netherlands)
EIRR	:	Economic Internal Rate of Return
FIRR	:	Financial Internal Rate of Return
FMO	:	Dutch Development Bank
GBB	:	Grameen Bikash (Rural Development) Bank (Nepal)
GGC	:	Gobar Gas (Biogas) Company (Nepal)
GHG	:	Green House Gasses
HRT	:	Hydraulic Retention Time
IDCOL	:	Infrastructure Development Company Ltd. (Bangladesh)
I/NGO	:	International/ Non-governmental Organisation
IRR	:	Internal Rate of Return
LGSP	:	Local Government Subsidy Programme
LPG	:	Liquefied Petroleum Gas
MAFF	:	Ministry of Agriculture, Forestry and Fisheries (Cambodia)
MARD	:	Ministry of Agriculture and Rural Development (Vietnam)
MFI	:	Micro Finance Institution
MININFRA	:	Ministry of Infrastructure (Rwanda)
MoU	:	Memorandum of Understanding
NABARD	:	National Bank for Agriculture and Rural Development (India)
NBL	:	Nepal Bank Limited
NBP	:	National Biodigester Programme (Cambodia)
NBPA	:	Nepal Biogas Promotion Association (Nepal)
NDBMP	:	National Domestic Biogas and Manure Programme (Bangladesh)
NLSP	:	National Loan Subsidy Programme
NPV	:	Net Present Value
PBPO	:	Provincial Biodigester Programme Office (Cambodia)
PDD	:	Project Design Document
PRASAC	:	A Cambodian MFI
PRSP	:	Poverty Reduction Strategy Paper
RBB	:	Rastriya Banijya (National Commercial) Bank (Nepal)
RET	:	Renewable Energy Technology
R&D	:	Research and Development
RSPN	:	Rural Support Programme Network (Pakistan)
SWOT/C	:	Strengths, Weaknesses, Opportunities and Threats/Constraints
Tk.	:	Bangladesh Taka (currency) (1 US\$ = Tk.70)
VAT	:	Value-Added Tax
VER	:	Verified Emission Reduction
YDEIG	:	Youth Development through Employment and Income Generation (Bangladesh)

1. INTRODUCTION

SNV Netherlands Development Organisation with financial support of the Netherlands Directorate-General for International Cooperation (DGIS) organised a two-day international workshop on 'the Financing of Domestic Biogas Plants' during the period 23-24 October, 2008. The workshop; conducted in Bangkok, Thailand; was participated by 68 participants from 21 different countries in Asia, Africa, Central America and Europe. This workshop proceeding is intended to bring the ideas and views of those attending the workshop to a wider audience of practitioners involved in the dissemination of biogas technology. This brief report summarises the purpose, schedule, presentations and outcome of discussions related to the workshop.

This workshop proceeding includes (i) the summary of plenary presentations (ii) Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis carried out by the participants on different aspects of financing of domestic biogas plants, and, (iii) Country action plans prepared by respective participants. As much as possible, the issues raised by the participants during different sessions have been presented in their own words.

2. BACKGROUND

Suitable financial instruments like credit and investment subsidy are required for the up-scaling of national programmes on domestic biogas in an increasing number of countries. Carbon revenues may become available as a new source for financing such instruments. Practitioners, researchers and policy makers in the area of both biogas and financing were invited to exchange the latest information about access to financial instruments by households and to arrive at more clarity about their strengths, weaknesses, opportunities and threats.

3. OBJECTIVE OF THE WORKSHOP

The overall objective of the international workshop was to exchange a maximum of information about the use of financial instruments for financing domestic biogas plants among the participants, being practitioners, bankers, researchers and policy makers, and to arrive at clarity about the strengths, weaknesses, opportunities and threats of the use of the various financial instruments among the participants.

4. SCHEDULE

The workshop was conducted for two days. The workshop programme consisted of three main sessions – plenary presentations on various aspects of financing of domestic biogas plants, group exercise on SWOT analysis, and preparation of country action plans. The detailed schedule has been given in Annex-1.

5. PARTICIPANTS

68 Participants from Bangladesh, Benin, Burkina Faso, Cambodia, China, Ethiopia, Ghana, Honduras, India, Indonesia, Kenya, Lao PDR, Nepal, Pakistan, Philippines, Rwanda, Sri Lanka, Tanzania, Thailand, Vietnam, and The Netherlands took part in the workshop. The heterogeneous group of participants included practitioners, bankers, researchers, policy makers, entrepreneurs and consultants. The details of the participants have been given in Annex-2.

6. PROCESS AND OUTCOME

6.1 Opening Remarks

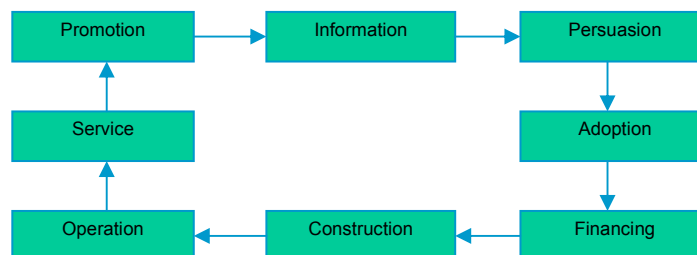
Following the formal registration of participants, a brief opening ceremony was organised in which His Excellency Mr. Tjaco T. van den Hout, Ambassador of the Royal Netherlands Embassy in Bangkok was the key speaker. In his opening address, the Ambassador congratulated SNV and its associated partners with the international award winning results achieved so far. At the same time, he indicated that the task ahead remains huge, with two billion people worldwide still lacking access to clean, safe and sustainable domestic energy services. He stressed the need to promote biogas technology more widely and effectively to benefit from the remarkable impacts at the micro level - to improve the quality of life of people, as well as at the macro level - to achieve the Millennium Development Goals and to reduce the adverse impacts of green house gases. As the benefits of domestic biogas plants are multiple and substantial, the Ambassador encouraged SNV and its partners to develop more activities in the region. He expressed his satisfaction for the effective utilisation of the financial support being provided by the Dutch government.



The opening remark of HE Ambassador was followed by the brief personal introduction of the participants. At the end of the informal opening ceremony, Mr. Wim van Nes, SNV Biogas Practice Leader, presented a token of appreciation to His Excellence the Ambassador.

6.2 Introduction of the Workshop

The workshop commenced with a brief introduction from Mr. Wim van Nes, Biogas Practice Leader (SNV Asia/Africa); on the background, objectives and expected outcome of the workshop. Presenting the model on dissemination of domestic biogas plants as shown in the following page, he highlighted the importance of financing part in the whole process. He described that the promotion of biogas towards potential users leads to increased awareness; reliable information to evaluation and decision making and persuasion to adoption. After adoption, financing is required before the construction and installation works take place.



He emphasised that the investment costs as well as the financial incentives such as subsidy and accessible credit schemes play a vital role in motivating a potential farmer to install biogas plant. According to him, present costs of domestic biogas plants of size 4 to 10 cum capacity ranges from US\$ 280 to US\$ 840 in Asian countries and US\$ 700 to US\$ 1300 in African countries.

The existing financing instruments, according to him are the investment subsidy (US\$ 79 to US\$ 300), credit (US\$ 130 to US\$ 1000) and farmer's contribution in kind (in the form of collection and supply of locally available construction materials and provision of unskilled labour for construction works) or even cash. He then put forth the following questions regarding the provisions of investment subsidy and credit mechanisms.

Questions about investment subsidy:

- What is the justification of investment subsidy?
- How effective is subsidy? How sustainable is subsidy?
- Does subsidy not distort the market?
- Does subsidy take away the incentive for innovation?
- Is subsidy pro-poor?
- Should subsidy be provided directly (to customer) or indirectly (through constructor)?
- Which part of the carbon revenues is to be 'returned' to the customers?

Questions about credit:

- How effective is credit?
- What are the suitable terms and conditions for credits?
- Is credit pro-poor?
- Are all prospective customers willing and able to apply for credit?
- How profitable is biogas credit for banks and MFIs?
- Should credit always be provided on commercial terms and conditions? May credit be subsidised directly (to the customer) or indirectly (to the provider)?

He expressed views that the workshop would be instrumental in getting answers to these questions. Mr. Van Nes then shaded light on the contents and schedule of two-day workshop and talked about some practical issues related to logistic arrangements.

6.3 Plenary Presentation on Financing of Biogas Plants

Presenting his paper on '**How to finance the farmers who needs biodigester?**', Mr. Arno de Vette from FMO described the following issues related to the financing of biogas plants:

- Funding sources for the farmer
- MFI-issues/conditions
- Loan-Interest Calculation example
- Reasons not to accept the MFI-loan
- Possible FMO-funding

Emphasizing that the biodigester investment, about USD 500, is considered as non-commercial investment, he highlighted that the savings, loan from informal channels (family, expensive loan sharks, etc.) and, loan from formal channels (MFI's, Banks etc.) as the major sources of financing. He mentioned the following major problems within MFIs in investing on biogas plants:

- no commercial purpose;
- no appetite to be involved in a subsidy related project or to generate a specific product for this;
- no experience with third parties like contractor.

He explained two different ways: (i) flat interest rate of 2% per month and (ii) interest rate of 30% per annum on declining balance; to calculate the interest on loan. The calculations showed that the interest amount in the first case was US\$ 96 whereas that in the second case despite the higher interest rate was only US\$ 65.



Mr. Arno de Vette mentioned the following to be some of the reasons not to accept the MFI-loan by farmer:

- High interest and or short repayment period;
- Monthly savings (less wood expenses) are less than monthly debt obligations, partly because of short tenor;
- Farmer already pledged assets with other MFI, or has no assets;
- No monthly cash inflow.

He highlighted the following salient features of FMO funding.

- Loan to partner MFI/Bank in USD or local currency;
- Credit risk for FMO with MFI/Bank, not on farmer;
- Special product with lower interest by MFI/Bank and subsidy for MFI/Bank afterwards, so that farmer also pays subsidized rate;
- Third party to monitor number of biodigesters and loans;
- Capacity development support/training/study.

In closing, Arno talked about the synergy when organisations like FMO and SNV work together. He mentioned that the technical competency of SNV and financial expertise of FMO could be complementary to each other.

6.4 Presentation of Country Papers

Arno's presentation was followed by country papers on financing of domestic biogas plants in China, India, Nepal, Bangladesh, Cambodia and Rwanda.

6.4.1 Country Paper from China

a. General

Presenting '**Financing of Domestic Biogas Plants in China**', Prof. Zhang Mi, Managing Director of Chengdu Energy-Environment International Cooperation (CEEIC) highlighted on the development of biogas digester models, biogas dissemination and development prospects, and, instruments and trends in financing of domestic biogas plants in China. He described overall modes and instruments of financing of domestic biogas plants in China, with main focus on the 'National Loan Subsidy Program' (NLSP). According to him, the NLSP has a leading role to promote biogas technology in China though the financing of biogas



plants is also done through the Local Government Subsidy Programme (LGSP), International Assistance Programme (IAP) and Self-Investment Domestic Biogas Programme (SDBP). Prof. Zhang told that investment subsidy has been the main financing instrument in China and such subsidy from the government has played a main role on the fast development of domestic biogas program. He told that with 50% of government subsidy, the pay-back time for the domestic biogas plant has been shortened to 1 to 2 years in terms of energy saving; and even much shorter with integrated use of biogas and bio-slurry. Prof. Zhang mentioned that the cost of a biogas plant of 8 cum capacity is about US\$ 440, out of which 50% is spent to purchase construction materials.

b. Presentation Highlights

- Under the frame work of National Loan Subsidy Program (NLSP) the amount of financing has increased from 1 billion CNY (1 US\$ = 6.8 CNY) in 2005 to 2.5 billion CNY in 2007. The subsidy contributes 50-100% of the total cost of installation. The rate of subsidy is usually from 800 to 1500CNY/household. However some very poor houses may receive over 2000 CNY;
- Investment subsidy is a popular financial instruments being practiced in China;
- The following are the strengths of investment subsidy:
 - The awareness level of the farmers and society has gone up sharply and biogas benefits are well perceived by the people. The NLSP/LGSP program is a huge government investment on rural infrastructure development. Investment subsidy on biogas plants has resulted in environmental protection and eco-farming system for sustainable rural development;
 - As the financing instrument of NLSP/LGSP is centralized and managed by the government, it is effective to standardizing design of digesters, appliances and quality control, and it guarantees financing for sustainable development as it is developed in a planned way in combination with the market economy;
 - With about 50% or more subsidies from the government, the users (farmer) are well motivated to build biogas digester and make full use of biogas and bio-slurry to get more benefits;
 - In view of the national planning, it makes easier to make a total program, propaganda, training and promotion as well as coordination with manufacturing and construction companies for a long term planning;
 - Subsidies attracts more farmers to install biogas plant resulting in better employment opportunities; improved rural energy, sanitation and ecology situations, and time savings for women users.
- The following are the weaknesses of investment subsidy:
 - The quick development in domestic biogas extension will bring some problems on maintaining digester construction quality, the guarantee of performance due to insufficient fermentation of raw materials like lack of animal waste and improper management etc.;
 - The time incurred to get subsidy is too long. The process should pass through several steps from propaganda—application—site selection—approval—construction—checking and acceptance—filing record—reimbursement;
 - It will become difficult to promote domestic biogas plants in a big stride without subsidy;

- The users with subsidized biogas plants may tend not to provide proper operation and maintenance services required;
- The task of subsidy administration is difficult and time consuming; specially in mountainous areas where biogas plants are scattered in wider geographical areas.
- The opportunities are:
 - International assistance in the form of additional subsidy in line with credit for some poor farmers to cover the financing part which the farmer should pay by themselves may improve the functioning of the instrument;
 - With subsidies, international mode of management and standardizing for construction and appliances may be introduced;
 - Carbon rebate (CERs and VERs) as subsidy could be a very strong promoter to improve the functioning of the instrument and bring more benefits in economy;
 - Exchange of information and international cooperation with internal and external parties could be useful for this kind of financing instrument for promotion.
- The following are the threats:
 - The gradual reduction in numbers of animals in farmer's households will inhibit the number of potential biogas users;
 - Un-stability of biogas technicians and workers will cause uncertain of construction progress and quality;
 - Change of government policy is the main inhibition factor to the instrument of financing; China's economy growth and policy will also affect the "National Loan Subsidy Program"(NLSP) and" Local Government Subsidy Program"(LGSP).
- Some of the problems experienced in China are:
 - In some less developed areas the local government can not afford the funding for biogas program in line with NLSP;
 - The potential users are decentralized and they are difficult to approach for propaganda, technical instruction and management;
 - There is a problem on getting labours as many young people tend to leave villages to work in urban areas;
 - Poor farmers are unable to contribute their own parts besides subsidy;
 - Post service and management after construction is often difficult;
 - Poor quality mainly of biogas appliances like stoves and lamps as well as pipes and de-sulphuring devices are creating problems.
- Prof. Zhang suggested the following recommendations to strengthen the existing system of financing of biogas plants in China:
 - There is need to increase the subsidy to benefit the poorer section of the community who are still not reached with the present model of financing;
 - There is need to ensuring management fee; either direct through the NLSP or the local government to support the biogas offices;
 - Additional incentives are needed to help the farmer to dig the digester pit and collect raw materials (animal waste) for fermentation;
 - Financing is needed for strengthening the R&D in new materials and new users;
 - Loan provision should be introduced and strengthened and specific issues on credit provisions should be studied.

c. Discussion Highlights

- Mr. Saroj Rai had a query on the mechanisms/policies within the central government to monitor/regulate the subsidy provided by the local government bodies. As per Prof. Zhang, there are no standard mechanisms in place at present and the policy on subsidy differs from province to province depending upon the level of poverty and the capacity of local government to allocate budget for monitoring purposes.
- Mr. Arno de Vette from FMO wanted to know (i) the percentage of households who took loans for installing biogas plants, and (ii) loan provisions. Prof. Zhang told that the cost of biogas plant in China is not that high (CNY 1800 to 3000) and users in most of the cases top-up the subsidy with their own contributions. He told that there is a special provision for loans for the farmers in rural areas through Agriculture Development Banks. The payback period ranges from 1-2 years with the interest rate ranging from 3 to 5% per annum.

6.4.2 Country Paper from India

a. General

Dr. K.C. Khandelwal, Advisor (Retd.) in the Ministry of Non-conventional Energy Sources in India presented the **Country Report on Financing of Domestic Biogas Plants in India**. He presented the salient feature of the National Biogas and Manure Management Programme launched in 1981. Dr. Khandelwal also gave an overview of cost estimation of different models of biogas plants being installed in India as well as the financial analysis without subsidy. Information on subsidy, financial institutions, lending terms and conditions, carbon financing, etc. were also dealt in the presentation. Results of SWOT analysis of various financing instruments such as subsidy, bank loans, and carbon rebate were shared with the participants. He suggested some recommendations – points for deliberations for discussions.



b. Presentation Highlights

- In India, the cost of domestic biogas plants designed for 40 days HRT ranges from US\$ 267 for 4 m³ plant (1 m³ gas production/day) to US\$ 533 for 10 m³ (4 m³ gas production/day); and that for plants designed for 55 days HRT are US\$ 356 and US\$ 689 respectively;
- For biogas plants with 40 days HRT, without any investment subsidies, the payback period varies from 4.07 years for 4 m³ plants to 2.45 years for 10 m³ plants; and IRR ranges from 33% to 50%. The payback period and IRR for biogas plants with 55 HRT ranges from 6.17 to 3.36 years and 24% to 38% respectively;
- Subsidy is provided as an incentive to farmers to invest in costly biogas unit to produce clean fuel without destroying manure value of cattle dung;
- Present subsidy level on 6 m³ fixed dome plant (2 m³ gas production/day) works out as:
 - 17 % of cost for general category
 - 22 % of cost for weaker sections
 - 46 % of cost for North-Eastern Region States;
- Reserve Bank of India through priority lending programme, NABARD through automatic refinancing scheme, Commercial Banks, Rural Banks, Cooperative banks, Land mortgage Banks and Microfinance through Self Help Groups are the major financing institutions in biogas sector;

- The following are the lending terms and conditions generally set by the financing institutions:
 - Composite scheme for dairy/agriculture
 - Technical feasibility by biogas staff
 - Repayment capacity from other income sources
 - Minimum 10 % of cost as farmer's contribution
 - Collateral security (cattle/land/gold ornaments and 1or 2 guarantors)
 - No margin money/down payment
 - 12 % Rate of interest (0.5 % less for women)
 - 3-7 years of repayment period
 - Loan amount disbursed in 2-3 instalments;

- 5,500 plants under the Bagepalli Project, 12,000 plants under Vedaranniyam Project, 10,000 plants under Hassan Project and 10,000 plants under Kolar project have been approved for CDM funds. Likewise 16,000 plants under the framework of Kerala Project have been registered for receiving carbon financing through Chicago Climate Exchange fund;

- The following table illustrates the outcome of SWOT (strengths, weaknesses, opportunities and threat) analysis of different financing instruments.

Table-1: SWOT analysis of Financing Instruments in India

Instrument	Strengths	Weaknesses	Opportunities	Threats
Subsidy	-Govt. budgetary support continues -Flat rate (2m3)- easy & transparent to administer	-High cost – less % subsidy -Corruption discourages	-Subsidy on LPG and fertiliser gradually being reduced	LPG reaching fast in villages
Bank Loans	-Priority lending - Insurance scheme -State Level Unit Cost Committee reviews and recommends cost of plants for banks	-No direct cash inflow and old plants not-in-use make branch managers reluctant to sanction loan -Small farmers not able to arrange collateral security	-MFI-collateral less Loans - New instruments such as credit card, smart card, etc.	-Relief measures to waive off interest or loans eroded capital base of rural financial institutions -Natural calamities-non-functional plants-no loan repayment
Carbon Rebate	-Many NGOs are developing projects -Adequate institutional capacity exists	-PDD costly & cumbersome -Likely insufficient to replace subsidy in full in first year, after adjusting costs on PDD , verification, etc.	-Profitable to financing institutions, MFI -Multi Commodity Exchange of India with Chicago Climate Exchange trading in carbon credits from Jan. 2008	-Kyoto protocol terminates in 2012

- The following are some of the recommendations – points for deliberations based upon the experience from Indian biogas programme:
 - Flat rate investment subsidy for small size plants, aiming to reduce payback period to < 3 years;
 - Model schemes by commercial banks – rate of interest same as for agricultural activities, repayment period 5-7 years, repayment instalments not > 50 % of annual savings;
 - Collateral-less group financing from MFIs;
 - Credit Guarantee Fund for Financing Institutions;
 - For CDM - PDD preparation support; simple and low cost methodology for validation and monitoring; Sharing of carbon rebate with plant owners;
 - Cost estimates- Holistic approach; include cow-shed + toilet, manure pits, manure packaging, etc.;
 - International financial + management support for capacity building, subsidy, etc., for fast but sustainable growth.

c. Discussion Highlights

- Mr. Balaram Shrestha from BSP-Nepal wanted to know about the discounting period while carrying out financial analysis. Dr. Khandelwal mentioned it to be 20 years which was based upon the average anticipated working life of biogas plants.
- Mr. Mosharraf H. Khan from PKSF Bangladesh asked if the Indian government has any programme/policies to encourage MFIs in biogas sector. Dr. Khandelwal replied that there are no planned/aggressive programmes at present.
- Mr. Uttam Jha from SNV Nepal questioned whether there is any mandatory provision for commercial banks to invest in biogas sector. Dr. Khandelwal told that the banks should invest at least 15% of their investment under priority lending scheme to avoid government penalty however, most of the banks prefer to pay penalty than to invest in the priority sector.

6.4.3 Country Paper from Nepal

a. General

Mr. Ramesh K. Gautam from SNV Nepal, presented the **Country Report on Financing of Domestic Biogas Plants in Nepal**. The presentation consisted of history of biogas programme in Nepal, instruments for financing domestic biogas plants, trend of credit financing, financial and economic analysis, as well as SWOT/C analysis of different financing instruments being practiced. Mr. Gautam described in brief objectives and some of the major findings of a study carried out in September 2008 to evaluate the state of the art on financing domestic biogas plants in Nepal. In the end, he described some of the major lessons learnt and recommendations for follow up.

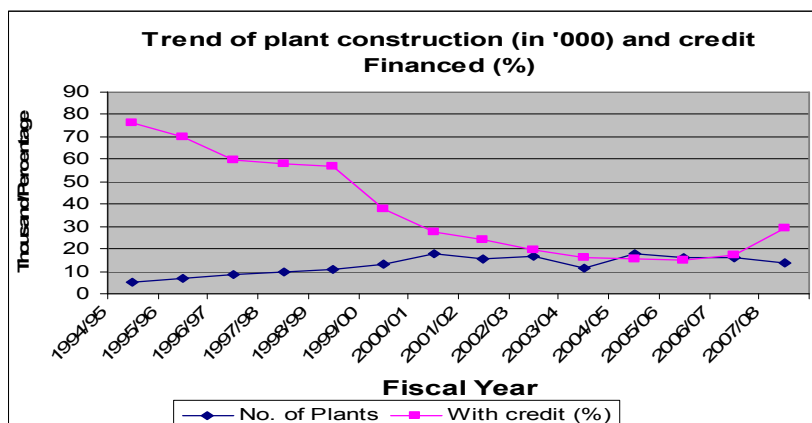


b. Presentation Highlights

- Officially there are two major instruments, namely, biogas subsidy and biogas credit fund applied for financing domestic biogas plants in Nepal. CDM fund is emerging as one of the potential source for financing biogas and there are also cases where I/NGOs and local

government are supporting directly or indirectly in promoting biogas through topping up subsidy/grants;

- The current subsidy structure is same in case of 4 m³ and 6 m³ bio-gas plants, slightly lower for 8 m³ plants and there is no subsidy for 10 m³ bio-gas plants. Current cost of installing domestic biogas plants ranges between US\$ 438 for 4 m³ plants in Tarai and US\$ 810 for 10 m³ plants in remote hills. Considering the number of biogas plants installed, BSP has categorised a total of 18 districts as Low Penetration Districts (LPDs) for 2007/08 which receive additional subsidy of US\$ 7.7 per plant. Further, in order to reach the poor, BSP has piloted an additional subsidy scheme for plant sizes of 4 m³ and 6 m³ amounting US\$ 23.1, US\$ 38.5 and US\$ 53.8 respectively for Tarai, Hills and Remote Hills in collaboration with Grameen Bikas Banks (GBBs) assuming that GBBs have a standard criteria and modality to identify poor and have service delivery outlets in more than 40 districts;
- With the decreasing share of ADBL, NBL and RBB on financing biogas, in early 2002, Alternative Energy Promotion Centre (AEPC) established Biogas Credit Unit (BCU) as a wholesale lending facility for MFIs to enable them on-lend to farmers for installing biogas plants. BCU has been working with 177 MFIs and provided wholesale loans over 150 millions;
- The trend of plant construction and share of credit is as shown in the following graph.



- The financial and economic analysis of biogas plants of different sizes is given in the following tables.

Table-2: Financial Analysis : Return to Households

Plant Size	Tarai			Hills		
	NPV	BCR	FIRR	NPV	BCR	FIRR
4 m ³	\$1,011	2.37	45%	\$1,293	2.77	55%
6 m ³	\$1,482	2.71	49%	\$1,482	2.86	52%
8 m ³	\$1,547	2.76	47%	\$1,637	2.85	49%

Table-3: Economic Analysis: Return to Society

Plant Size	Tarai			Hills		
	NPV	BCR	EIRR	NPV	BCR	EIRR
4 m ³	\$806	1.71	25%	\$1,211	2.03	30%
6 m ³	\$1,419	2.18	32%	\$1,541	2.24	33%
8 m ³	\$1,738	2.36	34%	\$1,839	2.40	35%

- The following table illustrates the outcome of SWOT (strengths, weaknesses, opportunities and threat) analysis of different financing instruments:

Table-4: SWOT Analysis of different financing instruments for Nepal

Instrument	Strengths	Weaknesses	Opportunities	Threats
Subsidy	-Transparent policy -Expanding network of biogas companies -Targeted and differentiated subsidy -Government support [10-27%]	-Partial penetration in southern parts of Tarai districts bordering to India -Lacking awareness in low penetration districts and village development committees -Market distortion due to topping up subsidies	-Increasing demand for up-scaling -Proven technology and standardised design -Carbon trading source for future funding	-Country in political transition -Rapidly increasing costs for construction materials
Credit	-Targeted credit fund -Expansion of MFI networks	-Credit more collateral-oriented -Variable loan terms across MFIs -Biogas perceived as non-income earning product -- reluctance of large MFIs to mainstream biogas product	-Increased interest of commercial and development banks in biogas lending -Increasing demand for biogas credit due to ↑price and scarcity of fossil fuels	-Government policy to waive loans provided to priority sector -Reaching poor through collateral-free lending

- The following are some of the major lessons learned:
 - Targeted credit fund is helpful in promotion;
 - Geographically differentiated subsidy is an effective approach;
 - Topping up of grants/subsidies increases promotion but also creates market distortion;
 - Access to financial services in appropriate terms for farmers contributes to promotion;
 - Loan product designed based on household cash flow ensures loan repayment;
 - Biogas is profitable business for MFIs.
- The recommendations are made based upon the experience from Nepal biogas programme:
 - Ensure continuity of subsidy for poor and remote areas;
 - Provide additional subsidy for low penetration districts and village development committees;
 - Streamline topping up of grants/subsidies into one-window system at district development committee level;
 - Promote close working relationships between biogas companies and financial institutions;
 - There is need to bundling of credit with income-earning activities (biogas plus);
 - Inflation-adjusted subsidy schemes should be introduced;
 - There is need to reach subsidy and credit facilities to poorer households in the remote areas. Promote collateral-free loan to reach the poor;
 - Link credit to insurance schemes to mitigate risk and motivate borrowers/lenders.

c. Discussion Highlights

- Mr. Mosharraf H. Khan from PKSFBangladesh told that the notion MFI's policy does not allow to actually reach the poorest section of the society is not true. He wanted to know whether the MFIs are more appropriate and approachable than bank in investing in biogas sector. Mr. Gautam had opinion that the poorest section could be penetrated with composite loan rather than biogas loan alone. He told that MFIs are more appropriate to invest in biogas sector; however, there is need to build their capacity for effective service delivery.
- Mr. Aadil Mansoor from RSPN Pakistan wanted to know the loan repayment rate. Mr. Gautam told that the repayment rate for bank loan is 60% and that for MFI loan is more than 90%. He shared his experience that good quality of construction as well as effective after-sales-services helps in better repayment rates. He also told that the loan taken by women has higher repayment indicating 'women behave better than man'. Soroj Rai from BSP Nepal told that there were some political reasons for the low repayment rate while the country was in conflict.

6.4.4 Country Paper from Bangladesh

Two papers were presented from Bangladesh – one from Grameen Shakti and the other from IDCOL.

Paper from Grameen Shakti

a. General

Mr. Dipal Chandra Barua, Founding Managing Director of the Grameen Shakti, Bangladesh presented the paper entitled, '**Financing of Biogas Plants – Experience of Grameen Shakti, Bangladesh**'. Mr. Barua started his presentation with the introduction of Grameen Shakti and its experience in solar home system and biogas technologies. He highlighted the financial model being practiced by the organisation and some of the important lessons learned. At the end he presented probable financial models for the users as well as implementing organisations.



b. Presentation Highlights

- Within three years about 6,000 biogas plants were constructed with around 300 large size biogas plants out of which over 30 biogas plants are producing electricity. About 1000 local masons have been trained and 100 demonstration sites are established to popularize organic fertilizers produced from slurry. About 95% of the plants are functional;
- Micro-credit linked with income generation and cost savings (instead of direct subsidies to make plants affordable) coupled with individualized customer care, strong quality control with free monthly visits for at least two years, easily available after sales service through training of local masons, creation of local stake-hold through job creation, entrepreneur development etc; promotes linkages with market forces to create a sustainable program;
- Grameen Shakti has demonstrated successfully that biogas programs can be successful without dependence on direct subsidies to attract rural clients. Micro-credit coupled with

effective after sales service & linkage with income generation should be the building block of a sustainable financial model;

- Direct subsidies do not help the end users, but creates inefficiency as many clients and implementing agencies construct the plants because of the subsidies. Clients should be shown how biogas plants help to reduce costs & increase income;
- High upfront cost is a major hindrance for clients. Micro-credit helps to reduce this through instalment payment and longer payback period. Instalments should match income and cost savings of an individual client;
- Implementing organizations are able to reach economy of scale because of higher client affordability and build up a revolving fund which allows them offer softer credit options to clients. This is a win-win situation;
- Quality control, effective after sales service is very important. Micro-credit ensures accountability because instalment payments are tied with monthly visits for plant check-up. Unsatisfied customers end up as defaulting customers;
- The most preferable financial model should : envisage 30% subsidy per plant for the implementing organizations to help reduce cost of plants and reach economy of scale; provision of long term credit (i.e. 10 years) at minimum interest rate to implementing organizations; extension of grants for technician trainings to include provision for creating entrepreneurs; and allocation of funds for special projects such as micro-utility model, biogas plant plus livestock model etc.

c. Discussion Highlights

- Mr. Dharma Raj Pandey from Paschimanchal Grameen Bank, Nepal wanted to know the reason(s) for the failure of 5% of the installed plants. Construction defects, improper quality control and incidence of bird flu resulting in shutting down of poultry farms were reported by Mr. Barua to be the cases.
- Mr. Saroj Rai questioned, 'What is the reason for relatively slower rate of plant installation in Bangladesh despite the fact that the supply and demand sides are conducive in the country?' Mr. Barua agreed that the number of installations per year could be more. He told that in quest to ensure quality, quantity could have been affected.
- Mr. Surya P. Hada from GGC Nepal asked if the larger commercial biogas plants also received subsidy. Mr. Barua told that no subsidy is provided to these plants, however, farmers can get support from the revolving fund established with support from GTZ.

Paper from IDCOL

a. General

Mr. Nazmul Haque, Director and Head of Investment Section of IDCOL Bangladesh presented the **country paper for Bangladesh on Financing of Domestic Biogas Plants**. Mr. Haque's presentation included the introduction of major biogas programmes in Bangladesh, current cost of domestic biogas plants, financing instruments used in the past and ongoing programmes, lessons learned, challenges faced by the ongoing programme, the FIRR analysis, the new financing structure for domestic biogas plants, and SWOT analysis of various financial instruments.



b. Presentation Highlights

- Biogas plants are being installed under the framework of National Domestic Biogas and Manure Programme (IDCOL/SNV), Sustainable Energy Development Programme (GTZ) and Youth Development through Employment and Income Generation programmes in Bangladesh (YDEIG);
- The costs of biogas plant ranges from US\$ 314 for the smallest size of 1.2 cum gas production per day (4 cum) to US\$ 975 for larger plant producing 10 cum of biogas per day;
- The following table shows the financing instruments being used in the ongoing biogas programmes:

Table-5: Financing instruments being used in biogas programmes in Bangladesh

Programme	Subsidy	Owners' Equity	Credit
NDBMP	23% of plant cost to owner No subsidy to agencies from the programme Owners pay USD 57 as service charge to agencies	77% for plant cost for cash plants 15% of plant cost in case of credit	Max. 62% credit from MFIs at 10-14% flat rate for maximum of 2 years, IDCOL provided MFIs with 80% refinancing facilities at 6% diminishing rate for 7 years with 1 year grace
Sustainable Energy Development	Maximum USD 286 to owner for social biogas plants No subsidy for commercial biogas plants	15% of plant cost	Credit for the remaining part of the plant cost from MFIs at 10-14% flat rate for maximum of 2 years. GTZ provides a zero cost revolving fund to MFIs which can be used for refinancing of maximum 40% of credit
YDEIG	17% of plant cost to owners in 10 selected areas	Not Mandatory	Maximum USD 286 per plant at 10% flat interest rate for 3 years. Collection efficiency is poor. No MFIs are involved

- BCSIR and LGED supported programme was not sustainable as many private agencies discontinued operation as soon as subsidy channel dried up, resulting poor after sales service;
- Under the framework of NDBMP, implementation target has become challenging due to lack of household confidence, higher construction cost, lower subsidy amount and low incentive to agents/ MFIs;
- The major challenges being faced by the ongoing IDCOL-SNV Programme are:
 - Cost of a biogas plant has almost doubled since 2004, resulting in higher up front equity contribution of plant owners and lower affordability;
 - Credit is available for a maximum of two years resulting in high monthly instalment.
 - No direct subsidy for MFIs is available from the programme;
 - Smaller MFIs do not have the necessary fund to invest 20% of the credit from their own resources;
 - Larger MFIs have better investment opportunities in other similar programs in terms of softer credit terms and economy of scale.
- The financing mechanism being used for solar photo voltaic programme is more effective than that being practiced for biogas programme;

- The new financing structure for domestic biogas would be:
 - Subsidy as a fixed percentage of the plant cost revised at periodic intervals instead of a fixed subsidy amount may encourage more households;
 - A phased-out subsidy scheme for the MFIs until the MFIs gain necessary institutional capacity to run the program on a sustainable basis may be helpful;
 - Incentive in terms of lowering the investment requirement from MFI's, offering working capital loan and/or providing similar refinancing terms like IDCOL solar program;
 - Like IDCOL solar program, flexibility needs to be created for plant owners by providing them with a 1-5 year loan;
 - A 'Sustainable Energy Fund' may be created using carbon revenue, which may work as a revolving fund to provide working capital and/or other financial support to MFIs.
- The base analysis considering saved biomass indicates a FIRR of 13.52%. The FIRR is much lower than 17% based on which the grant amount of Taka 7,000 per plant (US\$ 100) was fixed in the NDBMP implementation plan. To keep the FIRR same as before, minimum amount of subsidy to the plant owners should be Taka 9,549.
- The following table illustrates the outcome of SWOT (strengths, weaknesses, opportunities and threat) analysis of different financing instruments.

Table-6: SWOT Analysis of different financing instruments for Bangladesh

Instrument	Strengths	Weaknesses	Opportunities	Threats
Equity	Equity ensures household confidence and smooth operation	Equity finance is scarce and most expensive Poorer households may not afford high equity	Equity/mezzanine finance may be made available for larger plants	Poor performance of plants will discourage households to make equity investments
Subsidy	Subsidy to households encourages adoption of new technology and makes it affordable Subsidy to POs provides motivation and expedite performance Quality can be enforced	Subsidy makes people dependent Sustainability is difficult to assess and ensure in subsidized projects Subsidy may not reach to the intended parties	A phased-out approach may be beneficial Subsidy can be linked with no of plants to expedite performance	Subsidy is not unlimited and sources may dry up making biogas program unfeasible
Credit	Micro-credit is widely available in Bangladesh Reduces one time investment of the households Outstanding credit ensures good after sales More credit and less subsidy is needed for sustainability in the long run	Due to collateral free nature, micro credit is risky Interest rate is quite high compare to commercial bank rate Larger MFIs have better incentives in other programs Smaller MFIs have limited capacity to lend	Wider and rapid dissemination is possible by engaging micro-credit institutions Demand may increase due to low upfront investment by owners	MFIs may become bankrupt if collection efficiency is not healthy

Carbon Credit	Carbon finance can be used for ongoing development even when subsidy and concessional credit sources become scarce	Documentation is difficult and complex Carbon finance is time consuming	World carbon market is of more than USD 26 billion	Post Kyoto risk, carbon market may shrink after year 2012
---------------	--	--	--	---

c. Discussion Highlights

- Mr. Aadil Mansoor from RSPN Pakistan asked whether the solar programme, which was compared with biogas programme in terms of financing, falls under the same programme framework. Mr. Haque told that it is a different programme supported by the World Bank.
- Mr. Aart van den Beukel from Ecoventures asked for a clarification on the service fee for biogas plants. Mr. Haque told that the service fee is included in the plant cost and is paid by the farmer only one time.

6.4.5 Country Presentation from Cambodia

a. General

Presenting the paper entitled, '**Biogas Credit Plants in Cambodia**', on behalf of PRASAC¹ (a Cambodian MFI), Mr. Jan Lam briefly described the working modality of the organisation, introduction of NBP, the contractual provisions between PRASAC, FMO and NBP and various aspects of credit services. He also described the lessons learnt till date and some of the challenges ahead.



b. Presentation Highlights

- MAFF and SNV signed Programme Implementation arrangement for the phase I, 2006-2009 on 13th March 2005. NBP and ACLEDA Bank signed a MoU for channelling of subsidy to farmers on 5th July 2006. In October 2006, Biodigester credit study was conducted and subsequently PRASAC-MFI and NBP signed a MoU for biodigester loan on 30th November 2007;
- PRASAC Operate in 8 biodigester programme provinces with 60 branch and sub-branch offices and 1,033 loan plants with \$553,910 loan (average loan size \$536.2) were disbursed from November 2007 till Sep.30, 2008 out of 2296 plants were constructed under NBP. The % loan plants is steadily climbing, the % in the last 3 months is around 60%;
- The terms and conditions for biodigester credit are as follows:
 - Loan amount: 150.00US\$ - 1,000.00US\$, or 600,000 Riel – 4,000,000 Riel, but not more than the plant cost;
 - Interest rate: 1.2% per month or 14.40% per annum;
 - Loan Term: 4 months or 24 months;
 - Pre-repayment: \$150 subsidy from NBP is the first principal and interest pre-repayment after construction completed;
 - Interest is only calculated on the outstanding amount;

¹ Participants from Cambodia including PRASAC could not attend the workshop due to ongoing border dispute between Cambodia and Thailand during then.

- Repayment modes are flexible ranging from monthly to four-monthly;
- FMO and PRASAC Terms and Conditions:
 - 2 million USD, disburses in 3 trenches (2007-09);
 - Loan term 10 years;
 - Interest rate of 4% p.a. with no other fees;
 - Repayment made in 10 semi-annual equal amount;
 - No Collateral required (Pari passu).
- PRASAC – NBP Loan Procedures:
 - Step 1: A plant construction contract is signed between farmer, mason and Provincial Biodigester Promotion Office (PBPO);
 - Step 2: The mason constructs the plant under the technical supervision of the PBPO;
 - Step 3: Final inspection with completion form, handing over of plant to farmer. With the completion form the plant owner can claim subsidy at the PRASAC office (loan plants) or ACLEDA (cash plants);
 - Step 4: PRASAC verifies the form with the ID, and reduces the client's loan amount with US\$ 50. The completion form is stamped and returned to the client;
 - Step 5: At the end of the month, the total of subsidies is transferred by the NBP to a PRASAC central subsidy account;
 - Step 6: On a monthly basis PRASAC provides the National Biodigester Office with a list of plant code numbers and branches on which subsidy has been provided;
- The cost of biogas plants ranges from US\$ 430 for a 4 m³ plant to US\$ 990 for 15 m³ plant. The subsidy being provided by the programme covers 35% of total cost for 4 m³ plant and 15% for 15 m³ plant;
- The following are the major lessons learned:
 - Credit is an indispensable part of the biodigester programme; construction figures in 2008 are double the 2007 figures;
 - Constructing the high quality plants and the involvement of a reputed credit provider help in building community confidence;
 - Well designed loan product for Biodigester is required, ordinary consumptive loan will not do;
 - Access to inexpensive source of fund by the credit provider in order to provide credit to farmer at a reasonable rate plays an important role;
 - Good communication with beneficiaries/farmers about the benefit of biodigester plant and the credit conditions (joined brochure) helps in building trust;
 - Strong and clear collaboration between project partners (credit provider (PRASAC) and constructor (NBP)) at provincial level is essential.
- The following are major challenges:
 - Secure the credit programme while the programme is expanding;
 - Biogas credit is seen as non-productive, and therefore as a risk for the creditor, revenues of biodigesters have to be maximised and creditors convinced of the productive nature;
 - Need commitment of all stakeholders to solve any problems uncounted;
 - Capacity of the creditor has to grow with the increasing demand;

c. Discussion Highlights

- Question was raised by Mr. Prem Sagar Subedi from Winrock International Nepal on the modality of subsidy channelling for cash plants. Replying to this query, Mr. Jam Lam described the process of subsidy administration for cash plants. Once the construction works

are complete, the user visits the nearest ACLEDA bank with the plant completion certificate and his/her ID to receive the subsidy.

- Mr. Bastiaan Teune from SNV Vietnam wanted to know how important is the credit to popularise the technology based upon the experience from Cambodia. According to Jan, though the technology is well realised by the potential users, majority of them lack money to invest. Without investment we can not expect development. When you have money to invest, people approach you.
- Mr. Arno de Vette from FMO clarified the business modality between PRASAC and FMO. According to him, FMO provides a sum of US\$ 50 per installed plant to PRASAC to stimulate and motivate them to invest in addition to the provision of loan at very low interest rates of 4%. This amount is aimed at supporting the PRASAC management to deliver the service more effectively.

6.4.6 Country Presentation from Rwanda

a. General

Mr. Dominique Owekisa from SNV Rwanda presented country paper on '**Financing Domestic biogas plants in Rwanda**'. The presentation included country and programme overview; cost breakdown of 6 m³ biogas plant in Rwanda; SWOT analysis of the existing/proposed financial tools and recommendations on financing biogas in Rwanda in the future.



b. Presentation Highlights

- Electricity access in Rwanda is still at 5% and more than 90% households in rural Rwanda depend on fuel wood to meet their domestic energy needs;
- National Domestic Biogas Programme set up in 2007 with objectives of building 15,000 family sized, quality biogas plants by the end of 2011. MININFRA is the implementing agency with dedicated biogas team and allocates 25% of the subsidy fund. SNV is supporting for technical and programme capacity building while Banque Populaire du Rwanda with assistance from FMO is responsible for credit support;
- Total cost of 6 m³ biogas plant in Rwanda is about US\$ 1155. The government subsidy covers 32% of the total cost. The remaining part is contributed by the user in the form of local construction materials and unskilled labours (24% of the total cost) and in cash or credit from bank (44% of the total cost);
- The following table shows the outcome of SWOT analysis of different financial instruments in Rwanda:

Table-7: SWOT analysis of different financial instruments in Rwanda

Instrument	Strengths	Weaknesses	Opportunities	Threats
Subsidy	Start up (run-up) biogas sector motivates small farmers Direct payment to companies through farmer's account	Fixed amount (but total cost depends more on geographical characteristics and inflation)	Fine tune the terms/adjusted to inflation (percentage of cost, items, etc.).	May be very lowered in next years Subsidy expressed in a fluctuating money

	(avoiding misuse by the farmer) Quick to cash as Channelled through bank system Ensures quality plants (guarantee) Bank is assured (government participation/plant quality check) Promote digesters for the less well-off Smart-subsidy (ownership by the government insured at the beginning)			(international context) Cost of materials and Inflation Farmers relying on subsidy (subsidy dependence)
Bank Loans	Tailored to farmers' capacity Low interest rate Longest repayment period Loan product easy to understand and administrate In product term, Annuity = spending on fuel/month	Bank officers do not yet master biogas technology Repayment risk associated No collateral yet defined Limited amount for simplicity purpose Relying on 1 bank at the start can delay processes	Product to be adjusted (fine tuned terms and amount revised for all sizes) Loan marketing for the bank can be used by NDBP Bank involvement constitutes another quality channel for biogas product marketing and awareness New MFIs to be attracted in financing biogas (competition)	Rely on subsidized sources of finance (case of Rwanda)
Carbon Credit	Payment to the programme Product ready to the market in biogas Sustainability	Not easily understood Many methodologies	Investment from big companies Donor replacement & support programme Government motivation	Methodology used becoming obsolete After 2012 Government management (funds use & administration)

- The major lessons learned till date are:
 - The institutional setup took so long trying to separate NDBP & government structure;
 - Farmer's in kind contribution is key to the success;
 - Subsidy constitutes a great tool in convincing farmers to invest in a new technology;
 - As costs of materials go high, it is essential to not define the exact amount the farmer has to contribute;
 - FMO – BPR deal took too long at the expense of developing the sector in whole. Due to that the credit system is not yet in place;
 - Farmers are eager to take loans to invest in biogas construction, as a matter of fact, though the loan has not yet been launched within the bank; some farmers take other consumption loans to finance the construction of their plant.
- Based upon the lessons learn till date the following recommendations are suggested:
 - Education & assistance to farmers is necessary to master management of financial facilities;
 - Subsidy program could be flexible: subsidy as a % of plant total cost to be updated each year or subsidy expressed in "item – price";

- As methodologies evolve for CDM, we should keep ourselves ahead and maximize the potential benefits;
- Use IT and global connection to Internet to attract investors to invest small amounts in biogas (for instance loans to farmers as Kiva business model);
- Financial instruments for private companies have to be developed;
- Introduction of a loan - insurance for biogas plants.

c. Discussion Highlights

- Ms. Karin Bouwmeester from FMO Africa Department asked, 'who will benefit from carbon finance – the government, the users or the programme?' 'It should be the programme' was the answer.
- Prof. Zhang Mi from China asked if the biogas programme in Rwanda has any policy/programme to establish/promote construction companies and appliance manufacturing workshops. Mr. Dominique told that efforts are being made for VAT redemption while importing biogas tools and appliances; biogas companies are provided with loans to strengthen their business; and capacity building initiatives such as technical training activities are being launched targeting at biogas construction companies and workshops.
- Mr. Ramesh K. Gautam from SNV Nepal wanted to know the reason(s) for lower interest rates for biogas loans. He asked how it is subsidised. The answer from the presenter was that the existing interest rate (13% p.a.) on biogas loans is lower than that on other loans (17%). FMO has supported the Banque Populaire du Rwanda in this regards.

6.5 Presentation on Carbon Credit and Financing of Biogas Plants

Two papers were presented on carbon credit and financing of biogas plants as follows:

6.5.1 Presentation from SNV

a. General

Mr. Felix ter Heegde from SNV Biogas Practice Team presented a paper entitled, '**Carbon rebate - an alternative source for investment subsidy?**' The presentation comprised of various issues related to carbon financing including, the present situations, revenue limiters, 'up-front' carbon rebate, carbon rebate in instalments carbon rebate plus public financing and the major conclusions based upon the present scenario. He cited examples from the ongoing biogas programme in Vietnam and proposed programme in Pakistan to describe various aspects of carbon financing.



b. Presentation Highlights

- The existing scenario from the Vietnam biogas programme suggests that the conservative estimate of GHG reduction potential of one installation is 2 to 2.5 t CO₂ equivalent per year. With the existing market rates one plant can generate carbon revenue of Euro 250 over its crediting period of 10 years. Carbon revenue therefore nearly pays for the total investment on biogas installation;

- Payment on delivery, delay in procedure, uncertainty on post 2012 CER values and limited amount of nominal value up front claimable are some of the revenue limiters;
- Carbon revenue could (in Vietnam) pay for traditional investment subsidy, but closely reaches the limit of what can be made available “up-front”;
- Carbon revenue in instalments increases available fund and reduces up-front carbon revenue requirement, can link with annual after sales service / carbon monitoring and fits interest payment on biogas loan; effectively providing interest-free biogas loan. However, it complicates programme administration and logistics considerably;
- A combination of carbon revenue and public funding if “fuel-up once and the programme will continue forever”;
- If not for the carbon revenue – investment timing mismatch carbon revenue at “nominal value” could nearly pay for the entire installation;
- The following were the major conclusions of the presentation:
 - Taking current carbon revenue limiters into account, carbon revenue could replace the traditional investment subsidy;
 - Investment support in instalments increases the available carbon revenue and reduces the required up-front investment, but will take its toll on logistics and administration;
 - Public funding could bridge the carbon revenue gap, and –over time- make a programme financially feasible

c. Discussions Highlights

- Mr. D. Vidya Sagar from SKG Sangha India told that if government fund is used as investment subsidy, the programme will not be eligible for carbon credits.
- Mr. Jeroun van Bruggen from SNV Laos talked about the reasons why up-front payment in Vietnam and public funding provisions in Pakistan.
- Mr. Shuva Sharma from Nepal has questions on carbon revenue claims for the older plants. He asked if the owners can claim carbon revenue. Mr. Felix ter Heegde told that the farmers while signing a sale contract is requested to authorise the programme for claiming carbon revenue in the future.

6.5.2 Presentation from ADB

a. General

Mr. Jiwan Acharya, Climate Change Specialist in the ADB presented paper on ‘**ADB Carbon Market Initiatives and Household Biogas Financing**’. The presentation covered the information on ADB’s role in climate change; background of Carbon Market Initiatives (CMI); and CMI components such as Asia Pacific carbon fund, CDM technical support facility and Credit marketing services. He also described the ADB’s future carbon fund proposal and ADB CMI in Vietnam biogas programme. In closing he highlighted ADB’s major steps forward.

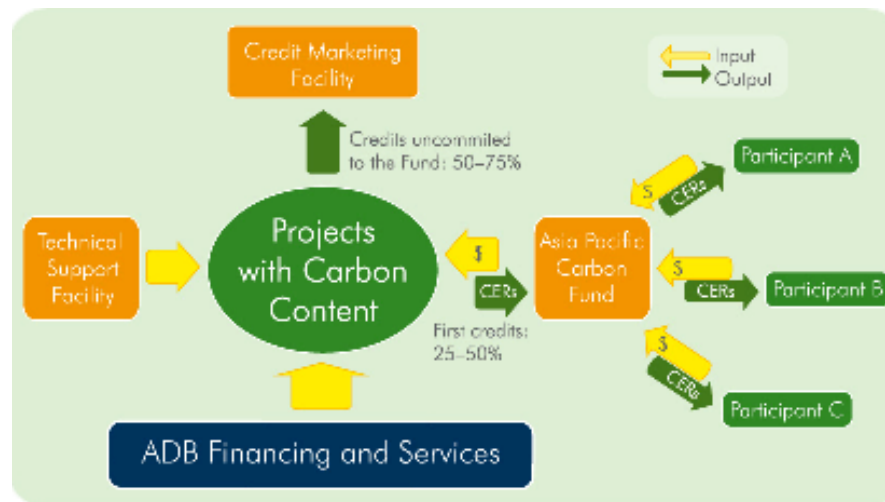


b. Presentation Highlights

- ADB’s main role in climate change is to catalyze the development and financing of new mitigation & adaptation projects. National/regional capacity building activities, loans,

investments and guarantees, project-specific technical support and the Carbon Market Initiative (CMI) are the major means to do so;

- CMI was approved by the ADB Board in November 2006 and it consists of three integrated components namely **Asia Pacific Carbon Fund**: upfront financing against carbon credit purchase; **Technical Support Facility**: grant-based technical support for capacity building, project preparation and implementation; and **Credit Marketing Facility**: marketing support to project developers for credits not used for upfront financing;
- The following figure describes the modality of ADB's CMI:



- Asia Pacific Carbon Fund aims at co-financing projects alongside ADB that have strong development benefits and comply with ADB safeguard policies, filling the critical project financing gap, purchasing 25-50% of expected carbon credits, and managing 100% upfront payment of contracted credits;
- CDM Technical Support Facility provides upstream support in project preparation phase that include due diligence: technical, financial, legal, safeguards, governance; capacity building trainings; carbon credit valuation, documentation preparation for credits (PIN, PDD, methodology); obtaining host country approvals and facilitating project validation & registration. Likewise, downstream support is provided for in project execution and commercialization;
- Credit Marketing Service assists with sale of credits *not* purchased by Fund and provides financial incentives for project completion;
- Future Carbon Fund has been proposed keeping in view the following international contexts:
 - Kyoto Protocol commitments ends in 2012; No international framework yet beyond 2012;
 - There is no long-term price signal to induce developing (and developed) economies to invest in new low-carbon technologies and infrastructure;
 - In the meantime, countries are installing conventional energy systems, locking the world into another 20-30 years of voluminous GHG emissions;
 - Mounting public awareness and pressure on policy makers to commit to long-term and meaningful reductions to avoid dangerous GHG concentrations;
- Future Carbon Fund (FCF) is established as the fourth component of the Carbon Market Initiative to pre-purchase future carbon credits (post-2012) from projects supported by ADB financing and the CMI;

- The key features of FCF are:
 - Purchase post-2012 carbon credits from projects proposed today;
 - Pay upfront to help developing countries reduce the capital constraint of installing clean energy and other low-carbon systems;
 - Proposed to project developers in conjunction with ADB financial support and the CMI;
 - Benefit from ADB's grant-based technical support;
 - Associated costs and risks are largely reduced due to "piggy back" design and strategy.
- The following are the Advantages for Project Developers from Carbon Market Initiative:
 - Certain funds today, for commodity with uncertain value in the future;
 - Reduced budget commitments to close the financing plan of projects;
 - Comprehensive technical and implementation support (grant funded);
 - Extra credits from successful project implementation can be marketed with ADB support for further financial upside.
- To address the existing financial challenges being faced by Biogas Programme in Vietnam, ADB has offered the following support package:
 - On-lending to the Government for household access to finance;
 - Technical assistance to support implementation;
 - CMIs support; additional up-front co-financing and technical support for CDM preparation.
- ADB has decided to step further to:
 - replicate and scale up household biogas in other countries;
 - continue supporting household biogas projects and collaborating with development partners;
 - establish a Regional Partnership for Access to Energy in Asia and the Pacific.

c. Discussions Highlights

- Mr. Basharat H. Bashir from AEDB Pakistan wanted to know about the terms and conditions for receiving up-front financing services. He asked if any renewable energy project receiving loan from ADB is eligible to get the service. Mr. Acharya told that any project supported by ADB, either through grant or loan is eligible for such services. He affirmed that the RE project receiving loan from ADB is eligible for up-front financing services.
- Mr. Ivo Besselink from UNDP expressed that the carbon market is quite confusing as there are many modalities in practice. He wanted to know which modality is considered to be the best by the ADB. Mr. Acharya told that the appropriateness of any modality depends on the context at which the project is developed or implemented. If a project envisages receiving up-front financing then ADB's approach would be the best.
- Mr. Uttam Jha from SNV Nepal asked if there are any risks to provide loans to the farmers directly without the involvement of a financing intermediate. Mr. Acharya pointed out the need of having a intermediate financing organisation to avoid the risk.

6.6 Closure of the Plenary Presentations

The plenary session came to an end with the ten presentations as mentioned above. Mr. Wim van Nes thanked all the presenters and felicitated them with token of appreciations.



6.7 Group Exercise on SWOT Analysis of Investment Subsidy and Credit

The next agenda after the presentation of plenary papers was the session on SWOT analysis of investment subsidy and credits to be done in groups. Mr. Wim van Nes introduced the following three topics for discussions. He asked the participants to keep in mind the issue of 'sustainability' while discussing.



- Investment subsidy (yes or no; if yes: direct and/or indirect)
- Credit (subsidised: yes or no; if yes: direct and/or indirect)
- Carbon revenue as source of finance for investment subsidy and/or (subsidised) credit

While forming groups, participants were asked to participate in whatsoever group they are interested to join. The participants were divided into four groups to carry out SWOT analysis and prepare SWOT matrix; two groups for the second topic and one each for first and third topics.

6.8 Presentation of Outcome of Group Exercise

Mr. Willem Boers facilitated the session on the presentation of outcome of group discussions.

6.8.1 Group-1: Investment Subsidy

a. Presentation Highlights

Mr. Felix ter Heegde and Mr. Bastiaan Teune presented the outcome of the discussion on 'Investment subsidy – curse or blessing?' The outcome of the presentations are summarised as follows: One of the main issues with the subsidy component in biogas programme is that it raises questions to media, evaluations, donors, development practitioners, and internal SNV staff. The reason for being it an issue is that biogas programmes do not always have an explicit justification for subsidy; and justification for subsidy is subject to context, place and phase of the programme. 'Situational Subsidy Justification Assessment (SSJA)' could be internal strategy, external justification, universal or situational (country/time/environment). The following are the arguments in favour or against subsidy, for which scores can be given by people from different stakeholders; a management reply may indicate the consequences of this exercise:

Arguments in favour	0	+	++	Arguments against	0	+	++
Promotion				Market distortion			
Quality leverage				Inflexibility			
Priming the market				Suppresses innovation			
Pro-poor				Expensive			

Affordability				Private benefits		
Public benefit				Addiction		
Govt. commitment				Unsustainable		
Steers development				Questions on ownership		
Total score				Total score		
Balance						

Management reply:

b. Discussion Highlights

Mr. Dipal Barua from Grameen Shakti, Bangladesh advised that SNV should play an important role to transform 'subsidy' as 'rewards'. If subsidy is continued, biogas programmes may face hard time – the programme should not effort on 'feeding' but to build capacity to 'eat'. It is better to allocate 'x' amount of money as revolving fund and reward the biogas companies based upon their performances.

Mr. Shankar Pandey from KfW Nepal told that the missing element is relationship between subsidy and cost of installation. The rising costs have created problems and we should consider this issue while deciding subsidies.

Mr. Shuva Sharma of Nepal asked, 'what are the extremes to justify subsidy? In what context the programmes will have zero subsidies?' Mr. Andrew Williamson from SNV Laos told that the compelling justification for subsidy in biogas programme is that biogas plant is a public good. He asked if any studies have been conducted to justify the public value of biogas plants.

Mr. Uttam Jha from SNV Nepal pointed out the need to relate subsidy with the cost of other conventional fuel sources.

Mr. Aadil Mansoor from RSPN Pakistan expressed his opinion that whether to provide subsidy up-front or in the other way depends upon the source of subsidy - from where it comes from.

Mr. Surya P. Hada form GGC Nepal shared the experience of his company which has installed more than 60,000 biogas plants in Nepal. He told that subsidy has been instrumental for marketing the product. The farmers are still in favour of subsidy.

Mr. Sundar Bajgain from SNV Bangladesh asked, 'what should be the governing factor to decide subsidy?' He said that in most of the cases FIRR do not indicate the need of subsidy. According to him, it is difficult to formulate exit strategy for subsidy. However, Mr. Mosharraf H. Khan argued that subsidy should not be for an indefinite period – there should be some exit strategy.

Mr. Willem Boers summarised that the majority of participants seems to be in favour of 'conditional subsidies'.

Mr. Wim van Nes told that every household is different however; FIRR is calculated for an average household which is virtually non-existing. He mentioned that many studies have been conducted on public goods and the findings have many good reasons to justify the need of subsidy. In general, if EIRR is higher than FIRR, the subsidy is justifiable and this is the case

with all the biogas programmes. However, he emphasised, biogas plants should not be given free. He questioned, 'what is market distortion? Which market will be distorted by subsidy? Does it distort competition between suppliers? Pointing out the case of Nepal where subsidy is continuing for many years, he told that the reason for such continuation is the issue of equity as there are less advantaged farmers still waiting to install biogas plants and they are desperately in need of subsidy. We are not nurturing only one child – there are 140,000 children only in Vietnam and need and demand are different for each child.

Mr. Saroj Rai from BSP-Nepal told that the issue of justifying subsidy and its quantity is very complex. There should not be 100% subsidy. Topping-up of subsidy by local government, NGOs and other donors is fine but it should be done on carefully controlled/structured/organised way so that it does not create complexities.

Mr. Jan Lam view was that if the modality and level of subsidy changes quite often, it will have negative effects on anticipated market. It creates lots of distortions in the market.

Mr. Jean de Matha Ouedraogo, Country Director of SNV Rwanda pointed out the need for clear commitment from the government on the subsidy issue. He told that a concept note for facilitating policy formulation on subsidy is being prepared. He hoped that this document would be instrumental for both the new as well as old countries with a biogas programme. According to him, the subsidy should be context specific, situational and flexible not only for biogas but also for other renewable energy technologies.

6.8.2 Group-2: Credit

Ms. Nguyen Minh Tam from BPD Vietnam and Mr. Peter Bos from SNV Tanzania presented the outcome of the discussions and SWOT analysis of credit as the financing instrument for biogas plants.

a. Presentation Highlights (group – a)

The major outcome of the discussion is that role of subsidized credit in dissemination of biogas technology has been viewed positively. Both direct and indirect subsidized interest rate, but up to a certain level of biogas market maturity in different countries have been proposed. The participants proposed to use the word '*incentive*' in place of '*subsidy*'. The following are the outcomes of the discussions.

Strengths:

- Increases accessibility to biogas technology for the farmers;
- Enhances outreach for MFIs;
- Assists in mass biogas dissemination for biogas programme;
- Ensures good quality of biogas plants (QC, QM, M&E);
- Encourages financial product diversification for MFIs.

Weaknesses:

- Unfavourable credit terms (loan ceiling, collateral requirement) may not encourage many households;
- Softer credit terms may distort the market;
- Sustainability is difficult with softer credit terms;
- Higher credit risk for MFIs as MF loans are usually collateral free;
- Smaller MFIs have limited lending capacity;

- Larger MFIs may have better investment opportunity.

Opportunities:

- Makes broader stakeholder platform for biogas sector;
- Provides access to external fund for MFIs;
- Increases saving habit for the households;
- Helps in commercialization of biogas sector;
- Expands the network for MFIs;
- Opens market for other RETs.

Threats:

- Subsidized credit may distort the microfinance market;
- High risk product may jeopardise MFIs' portfolio quality;
- Repayment may be affected by externalities, i.e. natural calamities, animal diseases etc;
- Political intervention – e.g. loan waiver by government.

b. Presentation Highlights (group – b)

- Subsidised credit is recommended to be provided to the users. Subsidised credit is a tool to promote/convince farmers to install biogas plants;
- Access to credit is a key. End users with cattle/land could respond to normal credit conditions MFIs are offering;
- Access to soft loan is key for the successful operation of MFIs. There is need to motivate MFIs to provide appealing biogas loans;
- Subsidised loans are sustainable. The example of PRASAC could be cited;
- The main success formula – soft loan plus premium on biogas plant constructed make MFIs a partner in success;
- Biogas loans to end-users, longer repayment period, reduced interest rate, grace period and flexible repayment amounts are important for successful credit administration;
- There is need to create win-win-win situation for end-users, MFIs and constructors;
- There is no need for investment subsidy if it is transformed to increased credit volumes.

c. Discussion Highlights

Ms. Fitria Astuti Firman from Indonesia described the unfavourable conditions existing in the country for credit investment. According to her, in most part of the rural Indonesia firewood is still available and accessible to use as cooking fuel. If the farmers in those areas are asked to take loans to install biogas plants, they will not accept it. Therefore, investment subsidy is much more important than credit in Indonesia.

Mr. Dharma Raj Pandey of Grameen Bank Nepal expressed the difficulty of a bank to provide subsidy on biogas credit and interest as it will have negative effects on other portfolio of the bank. His opinion was that rather than providing direct subsidy there should be some other ways to assist the farmers.

As per Mr. Saroj Rai, when there is soft loan coming from outside, the MFIs should be convinced to extend the pay-back period though it may lead to extended after-sale-services.

Mr. Arno de Vette from FMO expressed his views not to push MFIs to extend the loan repayment period. He told that FMO has made a mistake in Cambodia by offering a single MFI the soft loan

with very low interest rate (4%) and management support incentive (US\$ 50/per plant) – two way subsidies. This provision has made the MFI bit lazy and dependant on FMO. The better way would have been to go for tendering among MFIs or qualifying more than one MFI for getting loan.

Mr. Prem S. Subedi from WINROCK Nepal told that biogas plant does not generate cash/income directly, hence there is need to integrate biogas programme with other income generating activities concurrently. He cited examples of effective management of bioslurry to increase land productivity; provision of credit for high value crops to utilize bioslurry; and/or composite credit for biogas plant and income generation activities.

Mr. Dominique Owekisa from SNV Rwanda called for a market-exit strategy when the market is mature enough. When market grows it is better to gradually decrease subsidy and increase subsidised credit to ensure commercial market.

Mr. Shankar Raj Pandey from KfW put forth his views that well established biogas companies could be considered for credit provision. However, Arno did not agree this idea. According to him, companies might be very good in technical issues but may not be capable to handle the financial issues.

Dr. Fokhrul Islam from SNV Bangladesh expressed his objection over the use of the word 'by-product' to denote the bioslurry coming out of biogas plant. His view was that biogas and bioslurry could be termed as primary and secondary products but not as main product and by-product. He told that credit should be given for integrated farming system that also includes biogas plant.

Mr. Sundar Bajgain from SNV Bangladesh commented on the provision of subsidised credit. If we introduce the system of subsidised credit in place of investment subsidy, we force/compel all the farmers who wish to install biogas plant to take loans. Not all the farmers will be having a need/willingness to take loan. For the MFIs, credit may be the issue, however for the programme credit is not at all the issue but the product certainly is. He questioned how to be transparent on the amount of subsidy when it is combined with credit in subsidised form?

Ms. Subarna Rai from SNV Nepal raised the issue of Public Private Partnership. She told that the whole issue of subsidy, credit etc. is embedded in PRSPs and it is not a matter of debate. According to her, it is difficult to justify the government's policy to subsidise fossil fuels when they are providing detrimental impacts on the environment.

6.8.3 Group-3: Carbon Credit

Ms. Subarna Rai from SNV Nepal presented the outcomes of the discussion on carbon credit.

a. Presentation Highlights

The outcomes of the SWOT analysis are as follows:

Strengths

- Enhances sustainability of the sector
- Ensures local ownership
- Ensures long term functioning of biogas plants
- Helps in recognition of the sector at national and international levels
- Reduces burdens on public funds

Weaknesses

- Time consuming and cumbersome process
- High transaction costs
- Limited technical know-how in developing countries
- Complicated monitoring process
- Not a total solution to upfront financing
- Lack of ownership
- Lack knowledge of market potential and negotiating capacity

Opportunities

- Attracts external financing
- Upfront financing to initiate projects
- Increased market potential/accessibility through increased carbon finance
- Diversified opportunities for actors

Threats

- Frequently changing methodology
- Uncertainty beyond 2012
- Unavailability of the projected fund could damage the project
- Fluctuating prices of CERs/VERs
- Policy change could affect additionalities
- May trigger conflict on ownership

The major outcome of the group discussion is that the carbon revenue should be considered as source of finance for investment subsidy NOT for (subsidised) credit.



b. Discussion Highlights

Mr. Sundar Bajgain pointed out that the core question is how to get the carbon revenue as fast and easy as possible. He talked about the complexities in the utilisation of revenue once it is received as all the actors including government, biogas companies, biogas programme, biogas users and even MFIs may claim their stake and ownership. Hence, there should be a common understanding on utilising the revenue. According to him, carbon revenue can be used to supplement the subsidy amount when there is no external support available.

Mr. Basharat H. Bashir favoured a progressive subsidy mechanism. He mentioned that the carbon revenue in Pakistan is planned to be distributed equally among the government and the users.

Mr. Saroj Rai gave an example of a car factory, where all the departments have specific roles in manufacturing a car, however, the responsibility to sell the car rests on the marketing department. When farmers receive subsidy to install biogas plants beforehand they should not be considered as the revenue recipient. Preparatory works to claim and receive carbon revenue involves time, efforts and expertise which farmer as an individual can not do.

Mr. Uttam Jha said that there should be a clear and transparent policy in advance for the utilisation of carbon revenues. He cited the case of Nepal, where the government is willing to use the revenue for subsidy, R&D activities, capacity building of companies and programme management costs as well.

Mr. Jeroen van Bruggen told that the central idea of the carbon fund is that the programme should be benefited from it. However, money is received only when biogas plants are already installed though there are prospects that the money could be received upfront. If the revenue is received upfront, there will not be any difficulty in utilising the money for the implementation of the project.

Mr. Samir Thapa from AEPC Nepal told that the carbon revenue can be used to expand and/or continue the existing biogas programme or it can also be used to strengthen the after-sales-services. Alternatively, it can also be used for investment subsidy.

Mr. Arno de Vette called for 'keeping it simple' when it comes to the use of carbon revenue.

6.9 Carousel of Statements

Upon Mr. Wim van Nes's call for expressing any concerns or ideas which were not expressed during the discussions, six participants articulated their views on session allocated for carousel of statements.

- Pointing out the importance of demand side management as majority of the biogas programmes are concerned with supply side management, Mr. Prem Sagar Subedi from WINROCK International put forward the need to work with community based functional groups such as forest user's committee, village dairy cooperatives etc. to generate demand through awareness raising.
- Mr. Dipal Barua from Grameen Shakti highlighted the works of his organisation in creating demands for solar home system and improved cook stoves. According to him, effective financing is important for the successful dissemination of biogas programme.
- Mr. D. Vidya Sagar urged SNV to help non-SNV counties/programmes with the sharing of lessons learned as it has wealth of information. According to him, the core issue for any biogas programme is how to make carbon financing more attractive and sustainable.
- Highlighting the works of his organisation Mr. Mosharraf H. Khan from PKSF Bangladesh urged the participants to write off any confusions and bad conceptions on the suitability of MFIs to invest in biogas programme. He advised the participants to work with MFIs and their apex organisation like PKSF to finance biogas plants – not with commercial banks.
- Ms. Chanthip Luadhittirut from Micro-finance training centre in Laos shared the success story of her organisation. She told that the micro-finance sector in Laos is still in primitive stage with only 4 MFIs operating their services. She pointed out the need to create a conducive environment for MFIs to foster. She expressed her feeling that subsidy should be governed by the market conditions – the supply and demand.
- 'I felt 20 years younger while participating in this workshop as the issues that are being discussed here used to be discussed 20 years back' said Mr. K. C. Khandelwal from India. He stressed that the major focus should be on subsidy. He questioned, 'what is not subsidised? Which country is not providing any subsidies? It is common everywhere. According to him the term subsidy is a bad name created by the World Bank. They are now talking about pro-poor subsidy realising its importance. Subsidy depends upon the political will of the government. Providing subsidy for initiatives like biogas which has multifaceted benefit should be the



administrative responsibility of the government. According to him, capacity building initiatives aiming at dissemination of biogas technology should come from the government. He questioned, 'When LPG, kerosene and other fossil fuels are being subsidised, how can biogas be excluded?'

6.10 Country Action Plans

The session on carousel of statements was followed by an introductory session facilitated by Mr. Dominique on the formulation of future course of actions. Emphasising on the need of attainable action plans he urged the participants to take into account the findings of group exercise on SWOT analysis while preparing action plans for their countries. Participants were asked to consider the following guiding questions while preparing the action plans.

- a. What is the next steps for the financial instrument/How to further develop these instruments
- b. Shall we try to develop new instruments or money channelling? (tax rebates, get a cow, ...)/next generation of financial instrument?
- c. What should be the exit strategy and its implementation modality?
- d. How do we explain our financial instruments (donors, internally, media, end users, etc.)?
- e. How do we bring transparency and competition in financial instruments?

Participants formed groups according to the countries they represented. All the participants from West Africa joined together in one single group. In total 7 groups, as given below, were formed to prepare country action plans:

Group-1: Bangladesh

Group-2: Nepal

Group-3: Vietnam

Group-4: Lao PDR

Group-5: Rwanda

Group-6: Ethiopia and Kenya

Group-7: West Africa (Burkina Faso, Benin and Ghana)

6.10.1 Action Plan for Bangladesh

On behalf of Bangladesh team, Mr. Nazmul Haque from IDCOL Bangladesh presented the Action Plan. He presented a new financial model for Bangladesh programme mainly aimed at sustainability of MFI operation as the existing model is not effective enough to fulfil the programme target. He described the future action plan as follows:

a. Increase Investment subsidy:

- To maintain the same IRR that was calculated during project preparation in 2005 and to accommodate the cost rise, the existing rate of subsidy (Tk.7,000) will be increased in F.Y.2009/10 to Tk. 9,000. Based on the market trend and review findings the subsidy rate will be adjusted in F.Y.2011. It is expected that the subsidy could be lowered to Tk.7,000 in 2011.



- Existing Instruments
 - a. Investment Subsidy
 - Differentiated subsidy for 3 categories
 - Additional subsidy for poor
 - Other 'topping-up' subsidies
 - b. Credit
 - Banks
 - MFIs
 - Biogas credit fund channelled through MFIs
- Issues
 - a. Investment Subsidy
 - Not reaching poor and remote areas
 - Not adjusted for inflation, cost increase
 - b. Credit
 - Inadequate network and capacities of MFIs
 - Limited access to credit fund for MFIs
 - High transaction costs
 - Limited knowledge in biogas
 - Poor relationship between biogas companies and MFIs
 - Absence of credit instruments

Table-8: Action Plan for Nepal

WHAT (ACTIVITIES)	WHEN	WHO	SUPPORT
Built in system for inflation adjustment and review the subsidy policy and make provision for further differentiated subsidy	March 2009	AEPC/BSP-N	SNV
Encourage M/FIs for composite credit scheme to farmers	March 2009	AEPC/BSP-N	SNV/ NBPA
Develop and implement collateral free credit with insurance coverage	June 2009	CEDBL/MIFAN	SNV
Organise adequate training/awareness/capacity building for MFI/DBs, construction companies	Regular	BSP-N/NBPA/ MIFAN/NMBA	SNV/ Winrock
Expedite the transfer process of BCF to FIs	June 2009	AEPC	KfW/ SNV

The following clarifications were sought on the action plan.

- Mr. Prakash C. Ghimire wanted to know if there is any structured plan to mobilise other stakeholders from governmental agencies and non-governmental organisations working in biogas sector while implementing the action plan. He also wanted to know about the future action plan to overcome the difficulties as mention above.
- In response to the query, Mr. Saroj Rai clarified the proposed plan on mobilising the stakeholders.

6.10.3 Action Plan for Vietnam

Presenting the action plan for Vietnam, Mr. Jeroen Kruisman for SNV Vietnam highlighted the progress on using and potentials to exploit financial instruments available in the country. The following table shows the action plan prepared by the participants.



Table-9: Action Plan for Vietnam

What?	Who?	When?	How?
Subsidy -Rename 'Construction Investment Incentives' -Decision on changing the level/integrating with other instruments	DGIS/SNV/ EKN/ADB	2008-09	MTR (MARD/DARD/SNV) Discuss integration possibility with ADB credit, MARD,MOF.
Carbon Revenue -PDD -Assessment (CER/VER)	MARD/MoNRE BPD/SNV/ADB	2008-09	-Develop PDD -BPD-Baseline projection -Integrate QC -Assess why to go for CER/VER or combination -Find potential VER partner(s) -Assess prices
Credit -Assess Credit availability -Prepare institutional framework for credit implementation -Assess conditions to HHs -Assess conditions to MFIs -Assess possibility of Integration with subsidy	MARD/MoF/ ADB/MFIs	Begin in 2009	-16 provinces -Design loan conditions ADB ↔ MoF MoF ↔ MFIs MFIs ↔ Households -Discuss the possibility within ADB/SNV/MARD

6.10.4 Action Plan for Lao PDR

Mr. Andrew Williamson from SNV Laos presented action plan for BPP Laos. The main outcomes of the group discussion were:

- The quantum of subsidy will remain the same (Euro 100).
- No carbon financing for some years as the size of the programme is very small.
- There are very few MFIs operating – not even a single MFI with national coverage.
- MFIs do not have funds to invest.
- Rather than cheap loan and operational incentives, MFIs in Laos would opt for competitive bidding to provide effective services within the existing range of interest rates and their own terms and conditions.
- Promotional incentives to build capacity of MFI in the beginning could be considered.



The detail action plan has been given in Table-10, below.

Table-10: Action Plan for Lao PDR

Action	Date	Resp.
1. Shortlist external funding sources	End Dec 08	SNV (Timo)
2. Shortlist local MFIs and banks	End Dec 08	SNV (Timo)
3. Stakeholder workshop on BPP Finance Concept	Jan 09	BPP / SNV
4. Trial BPP loan product (1 area)	Feb-Apr 09	BPP / SNV

Mr. Ramesh K. Gautam from SNV Nepal expressed his concerns over the issue of financial institutions to impose terms and condition by themselves.

6.10.5 Action Plan for Rwanda

Action plan prepared by the participants from Rwanda and presented by Mr. Guy Dekelver is given below:

On Credit issue:

- Banque Populaire du Rwanda (BPR) to make some final decisions regarding internal procedures for the product and distribute it (BPR)
- BPR to provide information to FMO
- FMO to prepare finance proposal
- FMO – BPR contract negotiations
- FMO & BPR agreement (01/2009)
- Start giving few loans (e.g. BRD financing)

On subsidy issue:

- Formal process set (note sent to BPR)
- NDBP to open an account within BPR;
- Money released to that account according to Programme planning

On carbon credit issue:

- Data integration in HIVOS proposal (ongoing activity with ISAE)
- SNV – NDBP discussions on key conditions of HIVOS proposal + how to use the credits
- HIVOS – NDBP negotiations + signature

Mr. Samir Thapa from AEPC Nepal wanted to know why this particular bank (Banque Populaire du Rwanda) was selected for channelling the subsidy as well as providing the credit. According to Mr. Guy Dekelver the main reasons to select this bank are (a) its strong networks across the country (b) proven track records on disbursing loans on different sectors, and (c) FMO’s decision to have partnership with this bank.

6.10.6 Action Plan for Ethiopia and Kenya

Mr. Willem Boers presented the action plan for Biogas Programme in Ethiopia. The following are the action points:

Subsidy

- a. Change the name – ‘contribution to construction cost’ in stead of ‘subsidy’



- b. Formalize subsidy channelling mechanisms
- c. Mobilize upfront carbon funding once it is received
- d. Check financial regulation MoFED (on case to case basis)
- e. Discuss the relevance of subsidy for domestic biogas and document the outcome of discussions
- f. Ensure continuous improvements on subsidy channelling/management
- g. Review on subsidy level in case of extreme price fluctuation (>40%)

Credit

- a. Engage LCB for capacity building of credit providers mainly MFIs
- b. Prepare road map for development of credit
- c. Formulate verification regulations for external financing
- d. Carry out pre-selection of due-diligence of MFI
- e. Formalize partnerships
- f. TOR is prepared for product development aiming at MFIs involvement in biogas sector

Credit to Company/Mason

- a. Provide pre-financing (5 -10%) for labour supply and promotional activities
- b. Assist in product Development
- c. Formulate TOR/Road Map

MFI requirements identified

- Product Development
- Awareness
- Capacity Development
- Access to liquidity
- Risk coverage
- Partnership with TERRAFINA, AEMFI, SNV internal, FMO

Others:

- Formulate time frame for future course of actions.
- Share/exchange lessons for Kenya

Mr. Moses Wanga from SNV Kenya shared the lessons learned from Kenya based upon the experience from the previous biogas programmes under which some 2400 biogas plants were constructed. He emphasised that the issues of subsidy should be handled vary carefully not kill the initiatives in the ground. According to him, there are many MFIs operating in Kenya which have effective networks across the country. There is also an apex body of the MFIs. There is need to explore opportunity to work with this apex body. He was optimistic that the Programme Implementation Document for Kenya biogas programme which will be ready with in 2 months, will comprise of the details on financing modalities.

6.10.7 Action Plan for Burkina Faso

Mr. Jean Marc Sika from SNV Burkina Faso presented the outcome of the group discussions to formulate future plan of actions for the biogas programme in Burkina Faso. The summary of the presentation has been given below:

The main objective of the new programme in the country will be to start with sustainable long-term financing models.



Country Context

- There are about 100 MFIs with about 150,000 individual members in the country
- There is a federation of MFIs as an apex body
- MFIs are providing credits for trade and livestock with flat interest rates of 9.75% for loans with repayment time less than 24 months and 8.75% for more than 24 months
- There are about 50 regional MFIs operating in the country

Action Plan

- Develop a checklist to assess the suitability of MFI products to biogas programme
- Identify MFIs for partnership (preferably more than one MFI)
- Assess MFI's supply and demand sides management including acceptability of credit conditions by potential clients
- Work out the mechanisms to bridge the gap, if any, through innovative banking models (FMO?)
- Determine the level of co-financing (public-private benefit, spending power and willingness)
- Explore/assess other co-financing mechanisms/opportunities in the market
- Determine effective and accountable delivery mechanisms

Support Needs

- SNV TA to explore the possibility of involvement of FMO or other potential financing organisation to provide financial support to the selected MFI(s).

Mr. Wim van Nes asked what would be the strategy to overcome the difficulty in Burkina Faso where biogas is totally unknown and people may not be accepting to finance in a new product like biogas. He also asked whether the people have practices to invest in new products, and if yes, how to relate the existing habit/practice with biogas. Mr. Jean Marc Sika pointed out the need for effective promotional activities to raise peoples' awareness. He also indicated the need to determine the willingness of MFIs and the people to invest in biogas plants.

Mr. K.C. Khandelwal wanted to know if there are any biogas plants installed in the country. Mr. Jean Marc Sika told that there are few institutional plants supported by donors, however, no household biogas plant is installed till date. Mr. Khandelwal advised to start with the installation of some demonstration biogas plants in the given situation.

6.11 River Cruise and Farewell Dinner

The participants joined the river cruise for the dinner and informal discussions to share information in the evening of the first day and a farewell dinner in the second day. These events were appreciated by the participants in the sense that it provided good platform for the participants to exchange knowledge and information in free and relaxed manner.

6.12 Evaluation of Workshop

A formal evaluation of the two-days meeting of the members of the Network of Experts on Domestic Biogas was carried out at the end. The participants were provided with a semi-structured questionnaire to evaluate the effectiveness of the training. A total of 62 participants filled the questionnaire. The following table summarises the outcome of the evaluation.

Table-11 : Evaluation Results

Issues	Poor	Fair	Good	Very good	Remarks
Workshop Programme	0.0	6.5	50.0	43.5	- Programme was tight, but given the situation, it was understandable! - Very good! - Trip to see biogas plants in Cambodia could have been organised for all. - Just right – not too tight/compressed! - I see it being improved every time. - Mostly excellent except too many group breakings taking too much time. - Workshop should show clearly that it will be helpful to the new country. - The programme was too tight. Every day dinner with the same group was monotonous.
Opening by the Ambassador	0.0	9.7	51.6	38.7	- Demonstrated enthusiasm and commitment plus appreciation (genuine) of the work so far achieved. - Very high inspirational. - Underlines importance of workshop and Dutch policy. - Presence of ambassador increased importance/value of workshop. - Good reflections about biogas benefits. - Perhaps we should have taken 15 minutes extra of his time to somehow educate/request his actions/support in the region (a valuable chance!) - Nice he was here. The information was less important.
Presentations					- Sometimes, I could not follow the English!
Mr. Arno de Vette	0.0	16.1	59.7	24.2	- The idea of country presentation is very good.
Prof. Zhang Mi	6.5	25.8	58.1	9.7	- Some presentations were useful; others seemed in need of an objective!
Dr. K. C. Khandelwal	0.0	19.4	54.8	25.8	- Presentation time was a bit short.
Mr. Ramesh Gautam	3.2	17.7	56.5	22.6	- Presentations are totally good but need to be more specific on the main issue.
Mr. Dipal Barua	8.1	25.8	59.7	6.5	- Some discussions were out of topic – like the one from Bangladesh which talked only about solar..solar...
Mr. Nazmul Haque	0.0	19.4	58.1	22.6	- The presenters seemed not well prepared for question and answer. The presentations were not focussed.
Mr. Jan Lam	0.0	21.0	61.3	17.7	- Presentations aimed at boosting what has been done by their organisation (like the one from Grameen Shakti Bangladesh) should not be included.
Mr. Dominique Owekisa	0.0	8.1	74.2	17.7	- Too little time for discussion after each presentation.
Mr. Felix ter Heegde	0.0	3.2	54.8	41.9	
Mr. Jiwan Acharya	0.0	11.3	67.7	21.0	
Overall	4.0	15.0	60.0	21.0	
Group work of SWOT Analysis of Financing Instruments	4.8	17.7	50.0	27.4	- Idea of carousel was very good, irrespective of the remarks made by the participants. - To get more ideas group should be divided wisely.
Presentation and discussion on SWOT Analysis	3.2	19.4	51.6	25.8	- May be too many working group activities, I feel this seldom brings new ideas. - Discussion times too long. - Limited feedback especially on 2 nd day's discussion.
Carousel of Statements	41.9	30.6	27.4	0.0	- Met with objectives of exchange ideas. - Felt there was too much emphasis and time awarded for group meetings and presentations.
Group work on preparing country action plan	6.5	16.1	45.2	32.3	- Carousel of statement was new approach to note for me. For other presentations time was short.
Presentation and discussion on country action plan	3.2	17.7	50.0	29.0	- The carbon group was too big and failed to have good facilitation. - The carbon group was as if 'too many cooks spoil the broth'. - Carousel of statement – some persons were not at all useful. - No clear steps and procedures to talk. - Group discussion on carbon missed expertise. Therefore the discussion was about technique rather than the use. - The views expressed during carousel of statements were very weak and common; not good to participate if you do not have strong point to share. None of the participants impressed!
Preparation and facilitation of workshop	0.0	8.1	38.7	53.2	- Facilitators need to be identified in advance and be given directions on how to facilitate. - Excellent networking with conference organisers. Could not have been any better. - Excellent preparations. - Excellent to learn. - Wim van Nes's facilitation skill was very outstanding. Keep it up. - Very satisfied. Well prepared. - Wim was very good in facilitation but the other facilitators were average, seems they were not prepared for the job.

Hotel arrangements	11.3	35.5	27.4	25.8	<ul style="list-style-type: none"> - Too many food choices. - Excellent ambience, good food, disciplined staff. - Excellent venue. - Good arrangements, nice location. - Beautiful hotel, however, they insisted on US\$100 deposit on arrival which many colleagues could not afford. - It seems the hotel management do not trust SNV, they asked for deposit.
Overall Usefulness of workshop	0.0	3.2	35.5	61.3	<ul style="list-style-type: none"> - Put the outputs to related governments - Learned a lot, that will help me in working on biogas back home. - Wonderful opportunity to learn, update and network. - Involved in new biogas programme, received new information and more insight in various relevant issues on financial mechanisms. - For networking, it is extremely useful and productive. - No doubt it has shed light on financial instrument in different country context. - Got new ideas to use in my own country. - Both on information and networking.
Comments and suggestions	<ul style="list-style-type: none"> - Future workshop if any should have exclusive presentation/discussion on specific financial products. - Exchange information at networks. - Bangkok is very far from participants' country, next time look at a nearest place. - Was too tight, must try to make it lighter. - Very much informative and excellent opportunity to share ideas. Need to do such workshop every year. - This kind of workshop should be held by SNV on an annual basis – good for SNV to maintain its niche in the biogas sector. - Selected topic was good. Keep up following the progress in different biogas programmes. - Well organised, very much liked the opportunities to exchange ideas. - A well organised and useful workshop. - Too cold! - SNV is doing excellent work in the area of biogas to benefit rural families in the developing world. Keep up. Good bless your activities and dedications. - I wish this workshop was followed by field visits to some country programme. Further government/public sector participation could have been better. All in all, however, this was as opportunity of great learning and experience sharing. - Excellent! - Similar workshop along with trip to see successful biogas programmes should be organised in the near future. - Please continue with more workshops. - Time was short for full discussion and sum up. Minimum 3-4 days needed to all participants. Thank you! - Excellent work by Wim and Jean de Matha and others who organised this event. - The action points needs to be implemented and would be good to have somebody take follow up to that. - I had hoped to come away with some clear solutions for financing our programme. But to be honest there was not much new, and networking not so interesting (FMO and ADB already known!) - We very much appreciate the attention to details and thoughtfulness, eg. welcome note and chocolate! Thank you Wim! - Really enjoyed content and atmosphere of the workshop, thanks! - No conclusion on what is the best tool. - It would be interesting to invite some experts on some specific subjects to give good introduction or experience on certain fields. Perhaps also in discussion groups it could be wise to point experienced interviews – this may raise the level of advice/discussion. 				

6.13 Closing Remarks

The workshop came to an end with closing remarks from Mr. Jean de Matha Ouedraogo, country director of SNV Rwanda and regional sector leader for RE. He thanked all the paper presenters and the participants for their valuable contributions during the entire period of the workshop. Thanking Wim and Biogas Asia team, Jean congratulated the team for successfully organising and conducting the workshop. He acknowledged the trust of Dutch government on SNV to implement biogas and other developmental activities. He told that SNV's participation in Biogas programmes that started from Nepal and matured in Asia, has opened doors to many African countries. He reiterated that the knowledge and information exchanged during the workshop would be translated in the workplace for the betterment of the end users. He indicated that individual commitments from the participants to apply the learning would be very instrumental for the success of any biogas programme. He stressed, 'the objective of the workshop will be

fulfilled only when the information and lessons learnt are shared and utilised'. He urged all the participants to celebrate the success and express commitments to work hard in improving the quality of life of the people through enhanced access to energy in general and biogas in particular.

7. CONCLUSION

Providing uniform, transparent and direct financial incentives for rural farmer to finance a biogas plant have been an important factor in the success of the biogas programmes supported by SNV. The standardized, effective and careful administration of the financial instruments that is available only to biogas plants built as per the quality standards has been an important factor in convincing farmers to purchase biogas plants. Other factors affecting the success of biogas includes the long-term support of financing institutes for credits to biogas system and supplementary credit facilities provided through various means. As biogas plants benefit in terms of avoided costs and do not generate direct income to households; it is recognised that a mix of financial instruments, i.e., subsidy and credit on easy terms motivate farmers in developing countries to adopt biogas technology for improving the quality of life. Therefore, the issue of effective and accessible financial instruments should be a major concerns for all related to the dissemination of biogas technology. This international workshop has been instrumental in providing an organised platform for experts working in domestic biogas sector in general and financing of biogas in particular, in different countries to share best practices, problems and prospects on the use of different financing instruments.

The evaluation results clearly indicated that the workshop has been highly successful in achieving its objectives.

ANNEXES

Annex-1: Workshop Schedule

Programme Wednesday, 22 October 2008

08.00-08.30	Registration	All
08.30-09.00	Opening by His Excellency Mr. Tjaco T. van den Hout, Ambassador of the Royal Netherlands Embassy in Bangkok, followed by personal introduction	
09.00-09.30	Coffee/tea break	
09.30-09.50	Introduction to the Workshop programme	Mr. Wim van Nes
09.50-10.10	How to finance the farmer who needs a biodigester?	Mr. Arno de Vette
10.10-11.10	Financing of domestic biogas plants in PR China, India and Nepal (presentations, followed by discussion)	Prof. Zhang Mi Dr. K.C. Khandelwal Mr. Ramesh K. Gautam
11.10-11.40	Coffee/tea break	
11.40-12.20	Financing of biogas plants in Bangladesh (presentations, followed by discussion)	Mr. Dipal Barua Mr. Nazmul Haque
12.20-13.00	Financing of biogas plants in Cambodia and Rwanda (presentations, followed by discussion)	Mr. Jan Lam Mr. Dominique Owekisa
13.00-14.00	Lunch	
14.00-14.40	Carbon credits and financing of biogas plants	Mr. Jiwan Acharya Mr. Felix ter Heegde
14.40-15.00	Introduction to the group discussion on strengths, weaknesses, opportunities and threats of investment subsidy and credit	Mr. Wim van Nes
15.00-18.00	Discussion in 4 groups on strengths, weaknesses, opportunities and threats of the use of investment subsidy and credit (including coffee/tea break)	Facilitators (4x) Reporters (4x)
18.30-21.00	River cruise	

Programme Thursday, 23 October 2008

08.45-09.00	Recap of the previous day	
09.00-11.00	Presentation of and plenary discussion on the results of the group discussion on strengths, weaknesses, opportunities and threats of the use of investment subsidy and credit	Reporters (4x)
11.00-11.30	Coffee/tea break	
11.30-11.45	Carousel of statements (maximum 3 minutes per speaker)	Whoever
11.45-12.00	Introduction to group discussion on action plan	Mr. Dominique Owekisa
12.00-13.00	Lunch	
13.00-15.30	Discussion in groups on action plan	Facilitators Reporters
15.30-16.00	Coffee/tea break	
16.00-17.00	Presentation of and plenary discussion on the results of the group discussion on action plan	Reporters
17.00-17.15	Evaluation	
17.15-17.30	Summary and closure	Mr. Jean de Matha Ouédraogo
19.00-21.00	Farewell dinner	

Annex-2: List of Participants

SN	Name	Organisation/function	E-mail address
	<i>From Bangladesh:</i>		
1	Mr. Sundar Bajgain	SNV/Bangladesh, Biogas Advisor	sbajgain@snvworld.org
2	Mr. Fokhrul Islam	SNV/Bangladesh, Bio-Slurry Advisor	mislam@snvworld.org
3	Mr. Nazmul Haque	IDCOL, Director and Head of Investment	nhaque@idcol.org
4	Mr. Dipal Chandra Barua	Grameen Shakti, Founding Managing Director	dipal@grameen.com
5	Mr. Mosharrif Hossain Khan	PKSF, Deputy Managing Director	mosharrif@pkfsf-bd.org
6	Mr. Otto Gomm	GTZ, Programme Coordinator	otto.gomm@gtz.de
7	Mr. Khalequzzaman	GTZ, Senior Adviser	Khaleq.Zaman@gtz.de
	<i>From Benin:</i>		
8	Mr. Edouard Fagnon	SNV/Benin, Advisor	efagnon@snvworld.org
	<i>From Burkina Faso:</i>		
9	Mr. Jean Marc Sika	SNV/Burkina Faso, Portfolio Coordinator	jmsika@snvworld.org
10	Mr. Issouf Soré	Federation of Micro Finance Institutions, Regional Manager	soreissouf@yahoo.fr
	<i>From Cambodia:</i>		
11	Mr. Jan Lam	SNV/Cambodia, Biogas Advisor	jlam@snvworld.org
12	Mr. Prakash C. Ghimire	SNV/Cambodia, Regional Advisor Biogas	prakashchgh@gmail.com
	<i>From PR. China:</i>		
13	Mr. Zhang Mi	Chengdu Energy-Environment International Cooperation, Managing Director	zhangmij@sohu.com
	<i>From Ethiopia:</i>		
14	Mr. Willem Boers	SNV/Ethiopia, Biogas Advisor & ESA Network Leader RE	wboers@snvworld.org
15	Mr. Getachew Eshete Beyene	SNV/Ethiopia, Biogas Advisor	geshetebeyene@snvworld.org
16	Mr. Dereje Yilma	Ethiopian Rural Energy Promotion & Development Centre, Biogas Expert	dereje_yilma@yahoo.com
	<i>From Ghana:</i>		
17	Mr. Rajesh B. Shrestha	SNV/Ghana, Environment & Natural Resources Advisor	rshrestha@snvworld.org
	<i>From Honduras:</i>		
18	Ms. Carol B. Elvir Barahona	SNV/Honduras, Advisor Renewable Energy	celvirbarahona@snvworld.org
	<i>From Kenya:</i>		
19	Mr. Moses Wanga	SNV/Kenya, Advisor	mwanga@snvworld.org
	<i>From Lao PDR:</i>		
20	Mr. Andrew Williamson	SNV/Laos, Renewable Energy Advisor	awilliamsongearge@snvworld.org
21	Mr. Bounthavy Sengtakoun	SNV/Laos, Biogas Advisor	bsengtakoun@snvworld.org
22	Mr. Jeroen van Bruggen	SNV/Laos, Carbon Financing Advisor	jvanbruggen@snvworld.org
23	Mr. Thongchanh Santhasith	Biogas Pilot Programme, Project Manager	thongchanh@biogaslaos.org
24	Ms. Chanthip Luadhittirut	Microfinance Training Centre, Deputy Director	chanthip.lau@gmail.com
	<i>From India:</i>		
25	Mr. D. Vidya Sagar	SKG Sangha, President	skgsangha@gmail.com
26	Mr. Kailash C. Khandelwal	Consultant	advkck@yahoo.com
27	Mr. P. Krishna Rao	Centre for Rural Enlightenment, Salvation for Health and Environment (CRESHE)	creshe1991@yahoo.com
	<i>From Indonesia:</i>		
28	Ms. Fitria Astuti Firman	Ministry of Energy & Mineral Resources, DGEEU	fitria.firman@djpe.esdm.go.id
	<i>From Nepal:</i>		
29	Mr. Uttam Prasad Jha	SNV/Nepal, OSID Advisor/Sector Leader RE	ujhaprasad@snvworld.org
30	Mr. Ramesh Kumar Gautam	SNV/Nepal, Micro Finance Advisor	rgautam@snvworld.org
31	Mr. Tom Thorsch Krader	SNV/Nepal, Renewable Energy Advisor	tomthorsch@mac.com
32	Mr. Rajendra Shakya	SNV/Asia, Administrative Financial Coordinator of ABP	rshakya@snvworld.org
33	Ms. Subarna Rai	SNV/Nepal, Portfolio Coordinator and RE Sponsor PC	srai@snvworld.org

SN	Name	Organisation/function	E-mail address
34	Mr. Saroj Rai	BSP-Nepal, Executive Director	srai@bspnepal.wlink.com.np
35	Mr. Bala Ram Shrestha	BSP-Nepal, Director Administration & Finance	balaram@bspnepal.wlink.com.np
36	Mr. Samir Thapa	Alternative Energy Promotion Centre (AEPC), RESS Coordinator	samir.thapa@aepec.gov.np
37	Mr. Dharma Raj Pandey	Paschimanchal Grameen Bikas Bank	pandeydharma@yaho.com
38	Mr. Mahendra Giri	Sahara Saving and Credit Cooperative	saharanepal@ntc.net.np
39	Mr. Krishna Chandra Subedi	Nepal Biogas Promotion Association (NBPA), President	nbpg@nbpg.wlink.com.np
40	Mr. Shuva K. Sharma	Biogas Consultant The Gambia	shuva401@gmail.com
41	Mr. Surya Hada	Gobar Gas Company, General Manager	hada_surya@hotmail.com
42	Mr. Prem Sagar Subedi	Winrock International, Microfinance Specialist	psubedi@winrock.org.np
43	Mr. Manoj Goyal	Clean Energy Development Bank, CEO	manojgo@gmail.com
44	Mr. Shanker Raj Pandey	KfW. Local Expert	kfwnepal@wlink.com.np
	<i>From the Netherlands:</i>		
45	Mr. Wim van Nes	SNV/Asia & Africa, Biogas Practice Leader	wvannes@snvworld.org
46	Mr. Felix ter Heegde	SNV, Biogas Advisor	fterheegde@snvworld.org
47	Mr. Arno de Vette	FMO, Asia Investment Officer	a.de.vette@fmo.nl
48	Ms. Karin Bouwmeester	FMO, Analyst Africa Department	k.bouwmeester@fmo.nl
49	Mr. Aart van den Beukel	Ecoventures, Project Manager Home Biodigester System	a.vandenbeukel@ecoventures.eu
	<i>From Pakistan:</i>		
50	Mr. Aadil Mansoor	Rural Support Programmes Network (RSPN), Manager Special Projects	aadil@rspn.org.pk
51	Mr. Basharat Hussain Bashir	Alternative Energy Development Board, Consultant	bashara15@yahoo.com.au
	<i>From Philippines:</i>		
52	Mr. Yong-Keun Oh	ADB, Clean Energy and Climate Change Specialist	ykoh@adb.org
53	Mr. Jiwan Acharya	ADB, Climate Change Specialist	jacharya@adb.org
	<i>From Rwanda:</i>		
54	Mr. Jean de Matha Ouédraogo	SNV/Rwanda, Director & Regional Sector Leader RE	jouedraogo@snvworld.org
55	Mr. Guy Dekelver	SNV/Rwanda, Biogas/NRM Advisor	gdekolver@snvworld.org
56	Mr. Dominique Owekisa	SNV/Rwanda, Biogas Financial Support Advisor	dowekisa@snvworld.org
57	Mr. Augustin Hategeka	Ministry of Infrastructure, NDBP Manager	ahategeka@yahoo.fr
58	Mr. Justin Nkusi Gisanabagabo	Banque Populaire, Branch Manager Ngoma	justinkusi@yahoo.com
	<i>From Sri Lanka:</i>		
59	Mr. Rohana Kumara	LOLC, Assistant General Manager - Microfinance	rohana@lankaorix.com
60	Mr. Rajkumar Nagarajah	Alliance Development Trust, Programme Officer	rajacqueline@yahoo.com
	<i>From Tanzania:</i>		
61	Mr. Peter Bos	SNV/Tanzania, Biogas Promoter	pbos@snvworld.org
62	Mr. Peter T. Mashingia	SCCULT, Operations Manager	sccult@yahoo.co.uk
	<i>From Thailand:</i>		
63	Mr. Ivo Besselink	UNDP, Policy Specialist Carbon Finance/Task Manager	ibesselink@gmail.com
	<i>From Vietnam:</i>		
64	Mr. Jeroen Kruisman	SNV/Vietnam, Advisor Biogas & Renewable Energy	jkruisman@snvworld.org
65	Mr. Bastiaan Teune	SNV/Vietnam, Advisor Biogas & Renewable Energy	bteune@snvworld.org
66	Ms. Nguyen Minh Tam	BPD, Programme Coordinator	tammn@biogas.org.vn
67	Mr. Nguyen Thanh Son	MARD, Biogas Project Division, Director	thanhsonkn@yahoo.com
68	Ms. Le Phuong Anh	Vietnam Bank for Agriculture & Rural Development,	lephuonganh82@gmail.com