



***Study on Impact of Credit on the Installation
of Biogas Plant***

Final Report

Submitted to:

**National Rural and Renewable Energy Program
(NRREP)
Alternative Energy Promotion Centre (AEPC)
Ministry of Environment, Science and Technology
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Khumaltar, Lalitpur, Nepal**

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Acronyms

ADB	Asian Development Bank	KW	Kilo Watt
ADB/N	Agriculture Development Bank Nepal	LP	Liquefied Petroleum
AEPC	Alternative Energy Promotion Centre	MFDB	Microfinance Development Bank
AGM	Annual General Meeting	MFI	Microfinance Institution
BCC	Biogas Construction Company	MHP	Micro Hydro Project
BCU	Biogas Credit Unit	MW	Mega Watt
BOD	Board of Directors	NBPA	Nepal Biogas Promotion Association
BOK	Bank of Kathmandu	NGO	Non-Governmental Organization
BSP	Biogas Support Program	NPR, Rs	Nepalese Rupees
CBO	Community Based Organization	NRREP	National Rural and Renewable Energy Program
CEDB	Clean Energy Development Bank	OSS	Operational Self-Sufficiency
CMF	Centre for Microfinance Nepal	PAN	Permanent Account Number
CREF	Central Renewable Energy Fund	PAR	Portfolio at Risk
CRT/N	Centre for Rural Technology Nepal	PPI	Progress Out of Poverty Index
DDC/EEO	District Development Committee/ Energy and Environment Officer	REF	Renewable Energy Fund
DEEU/S	District Energy and Environment Unit/ Section	RET	Renewable/Alternative Energy Technology
EQI	Equal Quarterly Installment	RMDC	Rural Microfinance Development Centre
ESAP	Energy Sector Assistance Program	RSC	Regional Service Center
FINGO	Financial Intermediary Non- Government Organization	SACCOs	Savings and Credit Cooperatives
FY	Fiscal Year	SFCL	Small Farmer Cooperative Limited
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Society for International Cooperation)	SHS	Solar Home System
HH	Household	SKBBL	Sana Kisan Bikas Bank Limited (Small Farmer Development Bank)
ICIMOD	International Center for Integrated Mountain Development	SNV	Stichting Nederlandse Vrijwilligers (Foundation of Netherlands Volunteers)
ICS	Improved Cooking Stove	SPSS	Statistical Package for the Social Sciences
IGA	Income Generating Activities	TOR	Terms of Reference
IWM	Improved Water Mill	VDC	Village Development Committee
KfW	Kreditanstalt für Wiederaufbau (German Development Corporation)		

Executive Summary

Alternative Energy Promotion Centre, under the Ministry of Science, Technology and Environment of the Government of Nepal, has been promoting Renewable/alternative Energy Technologies in Nepal. AEPC mainly provides subsidy in installation of the technologies receiving support from different international organizations like KfW, World Bank, SNV and GiZ. Biogas is one of the alternative energy promoted by AEPC through biogas companies and microfinance institutions including cooperatives. Biogas Support Program (BSP), Biogas Credit Unit (BCU) and National Rural and Renewable Energy Program (NRREP) were designed to increase biogas use for cooking. AEPC provides subsidy to biogas users through the biogas companies and subsidized loan through microfinance institutions to construct the biogas plants. There are a total of 2,90,509 plants ranging from 4-20 cubic meter capacity installed in Nepal during fiscal year 2049/50 (1992/93 AD) to 2069/70 (2012/13 AD). AEPC has provided a total of Rs.3,000,859,300 subsidy to install the plants. In addition to the subsidy, biogas users have invested in cash (72% of the plants) and borrowings from financial institutions. AEPC/BCU has disbursed Rs.351.52 million loan to more than 300 partner institutions for biogas by Mid July 2013. Currently AEPC charges 6% interest on the loan to MFIs while they lend at 14% to the ultimate borrowers.

Despite AEPC efforts to promote biogas in the rural areas and the users are benefitted by biogas, wholesale/ commercial financial institutions have are not motivated in biogas lending and AEPC loan portfolio to the MFIs has poor quality (27.85% overdue as of mid July 2013). Continuation of subsidy is another issue as the donors are interested to promote the market mechanism.

In this background, AEPC had assigned Centre for Microfinance Nepal to conduct this study. This study had objectives to assess different biogas financing modalities, assess lending policies and strategies of MFIs for RETs, find the current status of biogas financing and assess different sources of user's contribution in biogas plant installation. For this purpose, the CMF Study Team¹ had conducted personal interviews with key support organizations KfW, SNV and World Bank; wholesale/ commercial financial institutions Clean Energy Development Bank, Bank of Kathmandu, Rural Microfinance Development Center and Sana Kisan Bikas Bank Ltd.; Biogas Companies; 26 Microfinance Institutions and 60 AEPC biogas loan users from 17 districts. Structured questionnaires were developed in close consultation with AEPC Officials before using them.

The study has found that the users and local financial institutions are benefitted and motivated with biogas and financing services. The biogas users have benefitted mainly by cooking fuel cost saving, improved health and sanitation. They have got easy and cheaper financial access from financial institutions in their locality and repaid loan in installment. Similarly, the MFIs have benefitted from spread income, provided services to the clients and satisfied to fulfill corporate social responsibility to improve health and environment. Despite these benefits, the users are worried mainly on maintenance of the biogas plants and not clear on the terms and conditions of biogas, biogas loan and amount of subsidy. Similarly, the MFIs don't have programs to educate the clients before and after loan. They are dependent on biogas companies on demand collection while there is no practice of loan monitoring except follow-up for defaults. This has deteriorated the portfolio quality too. On the other hand, the biogas companies have burden to manage subsidy as they have to wait for longer period after work completion to get refund from AEPC. The wholesale/ commercial banks have experience in biogas lending and they are interested but they are

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currently de-motivated because of subsidy and subsidized loan from AEPC. They are unable to compete with the subsidized fund from AEPC and interested to promote biogas at market rate. The donor organizations are also interested in lending to financial institutions and work in bulk to minimize operational cost and hence reach the hill and un-accessed areas. AEPC staffs have high workload in loan approval, monitoring and recovery as only two staffs are working.

In this regard, this study has recommended AEPC to work as a regulator and supporter in biogas promotion than providing loan. AEPC should continue the existing modality of direct funding on biogas only in the areas where commercial fund are not interested. Otherwise, AEPC should motivate the wholesale/ commercial financial institution in lending on biogas by providing fund at a special discounted rate (until it is not fully subsidy free) so that they can lend to the local financial institutions at some discounted rate and hence to the ultimate users. Similarly, AEPC has to make a subsidy minimization strategy. The geographically backward areas or poor people in the accessible area should only get subsidy. For this, AEPC is recommended to encourage/ support MFIs in poverty measurement. Similarly, in the existing modality, subsidy should be provided through microfinance institutions. For this, AEPC should select partner MFIs based on their interest, outreach, governance and financial strengths. AEPC has to assess, monitor, evaluate and support the MFIs in capacity building that ultimately supports quality of lending on biogas together with their overall strength. MFIs have to educate the clients on the biogas, biogas loan and subsidy mechanisms so that they can make informed decisions. The users should get loan from the MFI and pay for the services of the biogas companies immediately after completion of construction works. Minor maintenance should be managed through MFI while biogas companies will provide services in case of major maintenance and the users have to pay for their services beyond the warranty period. AEPC/ lender should charge commercial rate of interest to the MFIs at the time of lending and provide administrative grants based on repayment performance. Such grants should be earmarked for capacity building of the MFI or client education on biogas. Similarly, the MFIs should provide loan to the users at market rate and provide discounts to reward for timely repayment. AEPC should simplify the loan application documents from financial institutions. AEPC should focus on capacity building of the internal staffs as well as use external resources as needed to assess, monitor and train the financial institutions, users or other stakeholders.

This provision is expected to increase the outreach of biogas in Nepal with participation of private lending, support subsidy independence, capacity building of the MFIs, reducing financial burden to the biogas companies, providing need based financial resources to the users and strengthening microfinance technical capacity of AEPC. AEPC role will be more professional and specialized in policy formation, monitoring, evaluation, and regulation for functional environment in biogas promotion.

1. Introduction

1.1. Background

National Rural and Renewable Energy Program (NREEP) has been implemented by Alternative Energy Promotion Centre, a semi-autonomous organization under the ministry of science, technology and environment of the government of Nepal in a single program modality for five years from mid-July 2012. AEPC has been promoting Renewable/alternative Energy Technologies (RETs) providing subsidy to the RET users through different programs and projects of multiple agencies. In addition, different credit schemes are designed for different types of RETs with partnership of financial institutions. Biogas Support Program (BSP) has provision for credit to the biogas users from German Development Bank (KfW). As the efforts of commercial banks was realized inadequate to meet the credit needs and desirable expansion in biogas installation, Bio-gas Credit Unit (BCU) was established in 2000 under AEPC with responsibility to manage credit fund from KfW that provides wholesale loan to grassroots level institutions mainly the cooperatives and microfinance institutions (MFIs).

Biogas plants are installed in each of the 75 districts of Nepal with total 2,56,662 plants by July 2011.(AEPC:http://www.aepc.gov.np/index.php?option=com_content&view=article&id=86&Itemid=105). BCU provides biogas loan to 284 partners (microfinance development banks, non-government organizations and cooperatives) at subsidized rate (6%) so that the ultimate users receive the fund at around 14% interest. At the same time, commercial banks and wholesale microfinance institutions have funded directly or indirectly on biogas at market rate of interest through partnership with the microfinance institutions, cooperatives and venders. Commercial lenders have felt difficulty in biogas financing and seem passive mainly because of subsidized fund provided by AEPC. So, whether, whom or where to provide subsidy are emerging crucial questions to scale-up use of biogas in different areas of the country.

In addition to AEPC, commercial banks and wholesale microfinance institutions are important stakeholders in biogas financing. These financial institutions are involved directly or indirectly financing biogas. Some of the commercial banks have piloted their program to finance biogas in partnership with microfinance institutions, cooperatives and venders. Their experiences were exciting to promote biogas in the past as the institutions and their partners were benefitted while expanding their fund outreach to more users of biogas. The institutions had provided fund to the local partners at wholesale rate or provisioned for benefit sharing for their responsibility in loan monitoring. Later on, the local partners left partnership with the commercial sources as they got access to AEPC subsidized credit. The commercial banks and wholesale MFIs don't have comparative advantages of competing with AEPC subsidized credit for biogas financing. The commercial lenders are still interested to lend on biogas as it is important technology for the rural poor people but they are asking for an environment and policy that defines their role in this

campaign. So, their voices are to restructure AEPC role in regulating and monitoring for biogas promotion rather than handling subsidy and loan.

Subsidy is another important part of biogas financing. AEPC is providing subsidy for the individual users of biogas through biogas companies. The companies provide their services together with some non-local materials required to construct the plants. AEPC reimburses the cost of the materials and services to the companies from the subsidy amount when the companies claim the construction of individual plant is complete. In this regard, the companies have to wait for reimbursement for longer period and thus increased their cost of services. On the other hand, the individual users of biogas are not well aware and satisfied on the subsidy amount and the cost of equipments and services they received. This has questioned on transparency of the subsidy and its delivery channel.

With this background and with the realization from key stakeholders like AEPC, KfW, SNV, and Biogas Sector Partnership Nepal (BSP/N); need for study on the impact of credit on the installation of the biogas plants was identified so as to support policy formulation for smooth availability of credit in the days to come.

This study had major objective to assess different financial modalities of credit flow in biogas installations and also to suggest possible ways to increase the credit access to the hills and mountains for the installation of biogas plants.

This study was based on review of program documents, meeting with financial institutions, meeting with other stakeholders at the center, interviews with cooperatives and microfinance institutions and personal interviews with the biogas loan users. The findings of this study are expected to support AEPC to decide on proper financing modality that promotes biogas all over Nepal, specifically in the hill and mountain areas. This will ultimately scale-up and accelerate delivery of quality and need based renewable energy services to remote rural households leading to more equitable economic growth in addition to support environment protection.

In this regard, AEPC had selected Centre for Microfinance (CMF) Nepal to conduct the study based on the latter's application in open bidding for the assignment. CMF has prepared and submitted this comprehensive report of the study containing analysis on the impact of biogas loan, conclusion and recommendation for effective financing for biogas.

1.2. Objectives of the Study

The major objective of this study was to assess different financial modalities of credit flow in biogas installations and also to suggest possible ways to increase the credit access to the hills and mountains for the installation of biogas plants. The activities include:

- Assess the different financial modalities of credit flow in installation of biogas plants
- Assess the lending policies and strategies of Financial Institutions for financing RETs in general and biogas in particular.

- Conduct a survey in order to find out the current status (number of plants, size of loan, number of loan, location, default rate, etc.) of banks and financial institutions' lending in the biogas sector
- Find out if remittance is also being used for the construction of biogas plants
- Assess the different sources of utilization of user's contribution for the installation of biogas plants

1.3. Scope of the Study

The scope of work assigned included the following major activities:

Review of Program Documents:

CMF, under guidance and support from AEPC management, will review the existing documents in the AEPC/BCU including the following, but not limiting to.

- (i) BSP AWP 2011/12, 2012/13
- (ii) Previous studies undertaken on credit aspect
- (iii) Other relevant documents, if any

Meeting with different stakeholders:

It will be essential to meet with key concerned institutions/programme like AEPC, ESAP/REF, NRREP, KfW, SNV, BSP/N and Nepal Biogas Promotion Association (NBPA) including prominent biogas companies to seek their views on the study objectives.

Meeting with Financial Institutions:

It is imperative that thorough discussions be held with potential financial institutions like Clean Energy Development Bank, Himalayan Bank, Sana Kisan Bikas Bank, National Cooperative Bank, Rural Microfinance Development Centre (RMDC), Bank of Kathmandu, KIST Bank, Kumari Bank, Nabil Bank, etc., to understand their portfolio and how much is being allocated for biogas loan. The consulting team can also find out how the loan is processed and how the non-performing loans are being handled. AEPC/NRREP staff and team will also join the team during the meetings with the financial institutions.

Field Visit:

Besides visit to key institutions in Kathmandu, it would also be necessary to visit selected MFIs (Microfinance Banks, Financial Intermediary NGOs and Cooperatives) in the field to know their perception on increasing the access to credit facilities for biogas plants installations in hills and mountains. One of the key institutions to visit will be the District Energy and Environment Sections/Units in the district. AEPC/NRREP staff and team will also join the team during the field visits.

1.4. Thematic Areas and Methodology

Supply Side Study:

Secondary resources were reviewed to assess different financial modalities of credit flow in biogas plants such as subsidy and loan, AEPC/BCU documents, previous studies and related documents. Similarly, lending policies and strategies of financial institutions such as commercial banks on financing RETs were reviewed in sample with focus on bio-gas.

Meeting with different institutions/programme was conducted to seek their views on the study objectives. (*Annex 1: Resource Person Contributing for the Study*) In this regard, perception of AEPC, KfW, World Bank, SNV and some biogas companies were included in the study. Checklists of questionnaire were developed to facilitate the meetings. (*Annex 2: Check list for Biogas Expert Level Interviews*) The checklist for the biogas company included their work area, role, cost of constructing biogas in different geographic regions, problems, subsidy management, loan management, role of MFIs and suggestions to improve biogas promotion. Similarly, the other organizations were focussed on their role in promoting/ financing biogas in Nepal, their observations on the biogas financing modalities, strengths and gaps in biogas financing in Nepal, their observation on the major impacts of biogas credit to the users and other stakeholders, effectiveness of subsidy on biogas and their suggestions on appropriate ways / strategies to improve biogas credit access in rural/ remote and hill/ mountain areas.

Financial institutions namely Clean Energy Development Bank, Sana Kisan Bikas Bank, Rural Microfinance Development Centre (RMDC) and Bank of Kathmandu were visited to understand their experiences and portfolio on biogas loan. AEPC/NRREP officials were present in the team during the meetings with the financial institutions. A set of structured questionnaire was developed to record their views. (*See Annex 3: Checklist for meeting with Financial Institutions*) The questionnaires were focused on financing modality, lending policies and strategies, capacity building of the MFIs and clients, biogas loan data and information, subsidy, motivation factors for biogas financing, plan to increase biogas loan, obstacles, challenges in biogas access to hill and mountain, user level impacts of biogas loan, estimation on penetration of biogas loan, plans for partnership for biogas promotion and suggestions to promote biogas.

Out of total 284 financial institutions borrowing from AEPC, (*See Annex 4: AEPC Biogas Financing Partners by development Region*), 26 selected local financial institutions out of total 284 financial institutions borrowing from AEPC (*See Annex 5: Financial institutions selected for field study*) were visited at their place to know their experiences on financing biogas and plan for increasing the access to credit facilities for biogas plants installations. A structured questionnaire (*See Annex 6: Questionnaire for local financial institutions*) was used to interview the key officials of the institutions for quantitative as well as qualitative responses. The questionnaire covered general information on the financial institutions with outreach, products and services, methodologies and major financial figures. Similarly, their policy on rural energy/ biogas; their sources, scale, costs, terms and conditions of borrowing for biogas loan; scale, cost, terms and

conditions of biogas loan to the users; differences in delivering services in different geographical regions; methodology in delivering biogas loan; practices in monitoring biogas loan; motivation factors for biogas financing; plans for promotion of biogas lending; measures to handle non-performing loans; understanding of the user level benefits and problems and; suggestions to increase access to credit for biogas in the remote areas specifically in the hills and mountain. District Energy and Environment Sections/Units and biogas companies were also visited in some districts to know their experiences on biogas financing and impact issues. The financial institutions visited were selected in close consultation with AEPC/BCU. AEPC/BCU staffs had also participating in the field study.

In this way, supply side study will be focused on identifying and analyzing the supply side management and bottlenecks for effective delivery of bio-gas plants and financing options.

Demand Side Study:

Demand side analysis was focused on whether the users of biogas loans have willingness and ability to use loan. A total of 60 users of biogas plants were visited to know the impacts of biogas on them. So, about 2-3 users of biogas loan in nearby areas of MFI were visited for personal interviews. The users were visited by the study team at their home or at the institutions in some cases. Around 88% of the samples were taken from the rural area (VDC) while the rest from municipality. The interviewees were selected and arranged for interview by the respective local financial institutions. A set of structured questionnaire was developed for this interview. (*See Annex 7: Questionnaire for Biogas Users*) The questionnaires to the users were focused on their household data on livelihood and affiliation to local financial institutions; investment structure with complementary sources of installing biogas; motivation to use biogas; need and satisfaction to the biogas; sources of loan for biogas; awareness on price, terms and conditions of biogas loan; sources to repay biogas loan; major difficulties in biogas loan repayment; satisfaction on the price, terms and conditions of biogas loan; benefits of biogas they realized; costs of fuel replaced by biogas; perception on general problems of expanding biogas and their solutions and; suggestions to various stakeholders to promote biogas in wider areas.

Data processing and reporting:

The data and information received from the primary and secondary sources mentioned above were grouped, tabulated and summarized according to theme such as bio-gas financing modalities; policies and strategies of financial institutions in RETs including bio-gas; current status of bio-gas loan through MFIs; characteristics of bio-gas loan product; and demand side of bio-gas loan with household structure of financing and impact of bio-gas loan. SPSS software was used to process the data and information. The result of the data and information were used to analyze the impact of bio-gas loan and draw conclusion and recommendations of the study. The study has some limitations in availability of data and information specifically on financial data. Similarly, as the samples were taken from AEPC credit users, it has not covered biogas lending practices by other wholesale microfinance institutions and commercial banks at the field level.

2. Review of literature

The study team has so far reviewed following documents on the program and RETs financing specifically on biogas.

AEPC has explained the followings on the status of clean energy, biogas and biogas financing in the **TOR for Study on Biogas Credit**.

Micro-hydro, improved water mill (IWM), biogas, solar home system (SHS) and improved cook stove are some of the alternative/renewable energy technologies (RETs) promoted by AEPC. Subsidy is made available to RET users as per provision of the government and different programmes / projects supported through different agencies. Besides subsidy, provisions of credit schemes have also been made in some RETs particularly for biogas under the Biogas Support Programme (BSP) from German Development Bank (KfW). For solar, credit is made available by mobilizing resources of financial institutions. For micro-hydro, AEPC is handling GiZ funds through Fund Administrators (competitively selected banks) amounting to Euro 0.5 million namely, the Micro Hydro Debt Fund.

AEPC, through its programs have initiated the following activities for the promotion of RET via credit:

Solar Home System financing

Modus operandi of credit mobilization in case of solar home system and micro-hydro differs a bit from biogas. Unlike in case of biogas, no dedicated fund is made available for SHS under AEPC/ESAP, rather financial institutions, mainly commercial banks, are mobilized for the purpose. Capacity building support to local microfinance institutions (MFIs), particularly savings and credit cooperatives (SACCOs), in selected districts is provided through REF under AEPC/ESAP. Technical assistance is provided to financial institutions by covering their costs related to initial assessment, monitoring and supervision for financing. Once MFIs' capacity is reached to an generally acceptance level for lending by financial institutions, then the participating banks do extend wholesale loans to local MFIs which in turn provide loans to individual households. Under this modality more than 9,000 SHS are installed in 14 districts (Dailekh, Rukum, Rolpa, Panchthar, Sankhuwasabha, Bhojpur, Baitadi, Dadeldhura, Makwanpur, Dhading, Surkhet, Kalikot, Achham, Doti). Commercial banks extend loans at market interest rate (12%-15%) to local MFIs (SACCOs) which is further lent to individual clients at 18%-22% interest rate per annum. Besides making use of loan fund from commercial banks, SACCOs do also mobilize their internal resource for RET lending. To mitigate risk to both lender and users, accidental insurance for SHS is covered by insurance company.

Micro-hydro financing

In case of micro-hydro it is more community managed and financing is to start from Syarebhumi micro-hydro project in Nuwakot district. Nabil bank has approved Rs. 2.5 million for 250

households to be channeled through community based organization for launching the micro-hydro project. So far, more than 20 MHPs have been committed a loan and 12 have been already disbursed.

Recently IWM programme implemented by Centre for Rural Technology, Nepal (CRT/N) with funding from SNV Nepal has been merged with AEPC/ESAP. Asian Development Bank is extending support to AEPC to promote IWM with credit facility on pilot basis and provision of 0.5 million revolving fund has been made. CRT/N will be the implementing agency for this pilot project.

Biogas financing

Though, earlier Agriculture Development Bank Nepal (ADB/N) was the sole financial institution to provide credit to biogas users, other actors like Nepal Bank Limited and Rastriya Banijya Bank also joined hands later on. However, due to conflict on one hand and lack of interest of these banks in financing biogas plants on the other created gap in meeting credit need for biogas plant installations. Moreover, no other financial institutions came forward to provide credit to biogas users in wider scale. As a result AEPC was entrusted with the responsibility of managing credit fund from KfW. In this context, Biogas Credit Unit (BCU) was established in 2000, so as to provide wholesale loans to grass-root level institutions, mainly cooperatives and licensed MFIs.

Microfinance institutions (MFIs) including the microfinance development banks, financial intermediary non-government organizations and cooperatives are regarded as vehicles for changes in socio-economic status of rural and underserved communities as they reach there. These institutions provide various financial and non-financial services to the targeted people where they work. The microfinance sector has triple bottom-line goals namely social, financial and environmental promotion. Thus the sector focuses for socially acceptable, financially viable and environmentally sustainable measures in policies and programs. Though credit, savings, micro-insurance, remittance/money transfer and micro-leasing are the major products of MFIs, there are various non-financial services to support education, health, empowerment, environment protection etc. that are indispensable parts of our life. Clean energy promotion is another sector the MFIs are involved to provide access to finance for many poor and rural people. Bio-gas is the major clean energy source that benefits the rural people with cheaper and locally manageable energy for cooking and lighting.

By mid end of Asad, 2070, AEPC/BCU disbursed Rs. 351.52 million to help install more than 26016 plants through more than 300 partner institutions including microfinance banks, financial intermediary NGOs, savings and credit cooperatives, other type of cooperatives and community forest users committees. Out of the total disbursed amount, Rs. 304.29 million has been collected and Rs. 47.23 million is outstanding portfolio with more than 130 partner institutions. The overdue status by the end of mid end of Asad was 27.85 percent.

Region-wise plant installation with credit support indicates that about half (45%) of the total plants built on credit are in the Eastern Development Region, followed by 31% in the Western

Development Region, 14% in the Central Development Region and 4% each in the Mid and Far Western Regions. Interestingly, at one point in time, Jhapa district alone accounted for 29% of total plants built with credit facility. It was mainly due to close partnership/coordination between MFIs and construction companies in Jhapa district that led to such a great success.

Despite such achievement and the loan amount disbursed to MFIs exceeding the target of KfW fund, there were some constraints hindering smooth operation of the AEPC/BCU in the capacity of a professional unit/entity. The key ones are:

Limited manpower Vs. geographic coverage: With only Two staff it is difficult for AEPC/BCU to take care of more than 130 partner institutions stretching over 49 districts from Panchthar district in the east to Baitadi and Kanchanpur districts in the Far-west region for assessment of loans and monitoring and follow up for timely collection. This not only hinders quality monitoring but equally difficult to manage with the limited human resource strength the AEPC/BCU currently has.

Lack of credit fund: Based on increasing demand for biogas loan from different parts of the country, AEPC/BCU is neither in a position nor is likely to meet the demand with the limited biogas credit fund. Thus AEPC/BCU needs to prioritize its lending area and the biogas sector needs to look into other possible options for accessing credit fund for biogas lending.

Interest rate: AEPC/BCU currently lends at 6% to its partner institutions and they further lend to ultimate borrowers at 14% (with 8% margin max. as per AEPC norm). Compared to the market rate, interest rate charged on loans by AEPC/BCU is low thereby increasing demand for loan from not only existing partners but also from new ones.

Biogas Credit Fund Operating Guidelines (2011) developed by AEPC has explained biogas as a reliable, local cost effective alternative energy technology and thus it is prioritized by the government as a primary development intervention.

The main objectives of the fund are to increase access to credit for the installation of biogas plants to the consumers, grow as a secure capital fund to provide wholesale loans to financial institutions for the installation of biogas plants and renewable energy technologies and enhance the capacity of the financial institutions to provide easy access for the installation of biogas plants. The guideline has specified roles of different stakeholders in promotion of biogas. Biogas Coordination Committee coordinates, guides and monitor Biogas Credit Fund; AEPC manages and operates the fund with proper recording, sanction, disbursement, monitoring, supervision, collection, training and auditing activities through Biogas Credit Committee; Biogas Sector Partnership Nepal (BSP/N) keeps records of biogas plants financed and supports organizing training and capacity building events to the financial institutions. Similarly, Nepal Biogas Promotion Association (NBPA) supports in quality construction of biogas plants, training to biogas users, assure for timely after sales services, aware and motivate potential farmers for the biogas installation, coordinate the MFIs and companies for credit flow on biogas installation. The guideline has specified the role of Financing Intermediaries to provide credit to the farmers for installation of biogas plants, extend credit facility to the areas lacking formal or informal

credit services to install biogas, motivate the farmers/users to install biogas plants, certify the completion report of companies for credit provided plants, maintain the records of credit, timely repayment of loan and report the progress to AEPC. The guidelines has explained that the institutions registered under the Cooperative Act 2048, Financial Intermediary Act 2055, Bank and Financial institution Act 2063 and Nepal Rastra Bank Act 2058 are eligible to receive loan from the Biogas Credit Fund. The institutions receiving the fund must maintain the financial records according to acceptable accounting system, submit bank /financial institution guarantee for loan applied for at least three full year of operation in saving and credit activities, maintain minimum recovery of 90% and not blacklisted in credit transactions specifically by the central bank. The guidelines has also specified the required documents for loan, credit approval process, credit disbursement procedure, loan repayment procedure to the financial institutions. Similarly, credit approval and disbursement process from the MFIs explain that the MFIs should aware the users on biogas loan product, collect demand for biogas loan, facilitate the agreement between the farmers and biogas companies, approve the loan, enter the agreement between the financial institutions and the biogas users, distribute the first installment (at least 50%) after approval, release the second installment after completion of biogas structure (inlet, outlet and the dome), release the final installment to the company based on the total cost charged by the company less the subsidy amount. The financial institutions have to prioritize the disadvantaged groups and women while providing loan.

Sustainable Architecture & Energy Scaling-up Project (SAESUP) Manual (draft) explains renewable energy as cost-effective, social and environmentally friendly alternatives to improve the livelihood of rural people. The manual explains on scaling-up strategy of sustainable energy focusing innovation in financing schemes as one of the strategy. The manual concludes/suggests on innovation financing that subsidy mechanisms support strategic choices and orientations; fully or highly subsidized projects are counter-productive and users ‘in kind’ participation should be fostered; assess innovative incentives mechanisms; introduce financing schemes to cut-down the interest rates; build capacities of MFIs on basic technical issues and risk assessment and provide them technical support; create shared risk accounts and refinancing facilities and; develop fiscal mechanisms such as tax exemptions, land policies and/or additional tax on traditional fuel.

The manual has also reviewed Biogas Credit Fund in Nepal. In 1975, the GoN was providing for the first time interest-free loans for biogas users. Besides the Biogas Support Programme (BSP) experience shows that micro-credit has played a critical role in making biogas plants affordable for the poor since around 30% of the users take loan, mainly from MFIs, to construct biogas plants. In order to keep interest rate affordable for the farmers, a Biogas Credit Fund has been set-up. This revolving fund created by the KfW with a donation of 500,000€ is managed by AEPC. It provides loans and technical support to MFIs form AEPC. The manual also explain on biogas quality and after sale service monitoring system in Nepal that the Biogas Construction Company (BCC) has to submit a “completion report” on each plant constructed to BSP-Nepal in order to receive the matching subsidy after verification of the information sent. This report

contains: the name of the family with their photo and the photo of the plant under construction and completed, the name of the village with GPS localization, the “subsidy voucher” signed by the farmer (that confirms he received the subsidy from the BCC) and other details related to the biogas plant. In addition, the BCC has to provide the user with a two-year guarantee period (After Sale Service) with free maintenance. During this period, the BCC has to go and check the plant at least twice. This represents an additional incentive for the BCC to construct high-quality plants.

National Energy Situation Survey Report Nepal - Focus on Renewable energy & Poverty Reduction by Centre for Rural Technology Nepal, May 2005- July 2005 has explained that based on the fuel type, biomass provide 86% of the energy consumption, petroleum 9% (which is mainly consumed by the urban population), electricity only 2% and renewable energy 1% of the total energy consumption. The report states that among the entire energy resource base, biomass is the dominant resource base of the country with respect to its utilization.

The report has further explained that decentralization of new and renewable energy systems such as micro hydro, solar photo voltaic, biogas, improved cooking stove etc. provide feasible and environment friendly energy supply options in rural areas. The most important renewable energy technology in Nepal is related to Pico hydropower and micro hydropower (up to 100 KW), biomass energy (biogas, briquettes, gasifiers, improved cooking stove) solar photovoltaic (solar home system, solar PV water pumping, solar battery charging), solar thermal energy (solar water heater, solar dryer, solar cookers etc)

The improved cook stove and biogas programs initially has a goals to reduce firewood consumption but now they also justify themselves on health and environment ground and are linked to income generation as well as reduction of women’s drudgery. Biogas has been mainly used for cooking and the bio slurry has been used as a high quality fertilizer for increasing agriculture productivity. Solar energy has been used traditionally for drying such things as crops, clothes, fuel wood, and crop residues. The solar energy potential in Nepal is estimated to be about 26 million MW. Currently there

Table 1: Renewable Energy Database for Nepal

S.N.	Particulars	Description
1	Share of Energy Supply	
	Biomass	86%
	Petroleum	9%
	Coal	2%
	Electricity	2%
	Renewable	1%
2	Share of energy Consumption	
	Residential	90%
	Industrial	4%
	Commercial	1%
	Transport	4%
	Agriculture	1%

Renewable Energy Technology

S.N.	Particulars	Description
1	Biomass Based technologies	
	ICS	200,000
	Biogas plant	128,223
2	Solar Home Technologies	
	Solar Home System	57,875 units
	Solar Cooker (Parabolic Type)	800 units
	Solar Water Heater (commercial)	35, 000 units
3	Hydro Based technologies (de-central)	
	Improved water Mills	1092

Source: CRT Nepal, May 2005- July 2005

are two types of solar energy technology in the country: solar thermal systems and solar photovoltaic (PV) systems. Solar water heaters and solar dryers are two main types of solar thermal devices. Solar cookers were introduced by the Research Center for Applied Science and Technology (RECAST) in 1977 as parboiling cookers.

The report says about 11 million tons of fuel wood are burnt for cooking alone. Theoretically it is possible to reduce fuel wood consumption for cooking by 50 per cent. The amount of fuel wood saved depends among other things on the type of ICS. Even with a low performance of 11 per cent wood savings, estimates indicate that one ICS can save an average of one ton of fuel wood annually. Since the introduction of ICS in the early 1950s, more than 200,000 ICSs have been installed. From 2001 as March 2005, 125,498 ICS had been installed in the country.

An article by *Winrock international* titled “*Opportunities in Micro financing Renewable Energy Services in Nepal*” explains huge dependence on traditional fuels-fuel wood, agricultural residue and animal dung (accordingly for 88% of primary energy use). Though the government has given priority to promoting RETs and also providing subsidies, rural poor are deprived of the benefits of the technologies and the government subsidy because they lack the ability to pay the upfront cost required for purchasing such technologies. The article also explains that MFIs can provide credit to rural poor for acquiring RETs. Basically some of microfinance development banks and cooperatives are providing loans to bio-gas. The article points out need of portfolio diversification by MFIs to include RETs. The article also explains the Solar Electric Light Fund (a revolving loan fund by WWF Nepal for bio-gas) is very successful given a small amount of start-up funding for purchasing PV home lighting systems. Grameen Shakti in Bangladesh has also successfully installed over 100,000 solar home systems in rural Bangladesh under vendor financing model. Grameen Shakti has a leasing model called micro utility and targeted to those communities unable to purchase the system at once. The owner of the system pays a monthly instalment to Grameen Shakti and collects a load charge from the other users according to the load capacity used. This article concludes that RETs are bankable loan products for MFIs and there is huge market for financing RETs which not only improve the quality of life of the rural poor but also be a means for income generation through their productive uses. This also points out on capacity development needs of MFIs to motivate them in this sector.

DESER I pilot phase completion report of ICIMOD has recommended for innovative financing scheme. The report states Promoting decentralized renewable technologies will not be feasible unless subsidies and local finance sources are available, given the low affordability of the local people for purchasing some technologies with high upfront cost. Considering the stream of low household income cycle in light of the high upfront capital investment required for some modern energy technologies, there is a need to establish innovative financing mechanism through the provision of flexible lending term backed by smart subsidy with a clear exit strategy. Various policy options can be envisaged to overcome the hurdle of high upfront cost of some renewable energy to end users. These include:

- Mechanism to staggered payment over reasonable period of time

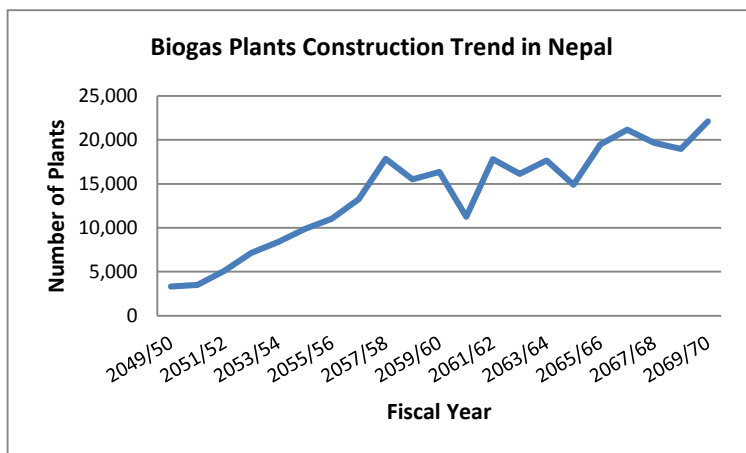
- Financing through financial intermediaries whereby a manufacture or retail distributors acquires loan which are reverted to consumer that buy product from them,
- Micro credit and self help group financing which enable access to affordable credit with a long time maturity period
- Fees for service model that enable access to service without need to pay in full for the products,
- Leasing the system to end user rather than selling them which overcome the problem of high upfront cost
- Providing targeted credits to local development financing institutions to provide consumer credit as a part of renewable energy projects and
- Dealing directly with renewable energy service companies (RESCO) rather than end users in which the companies install and maintain renewable energy system, and collect monthly charge for the use of the facilities.

The report clarifies further on the options such as micro credit and self help group financing can be considered the most promising options that have been already been tested and proven effective for financing small scale renewable energy products for individual use. This option appears promising in Pakistan and Nepal where NGO sponsored self help groups are already operating group saving and credit schemes.

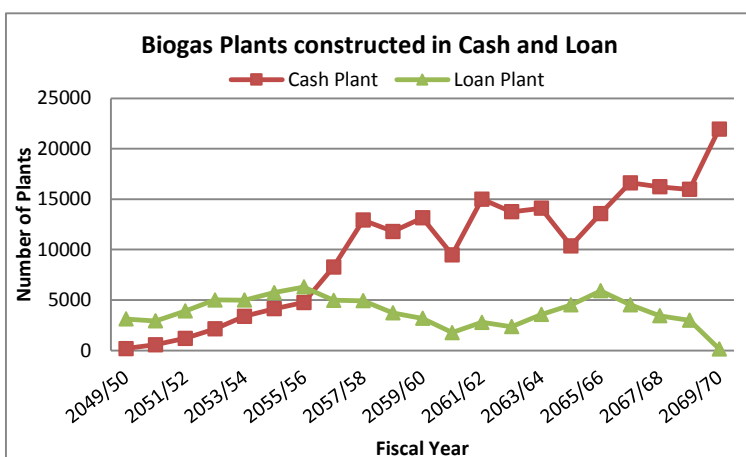
3. Findings of the study

3.1. Review on Biogas Credit by AEPC

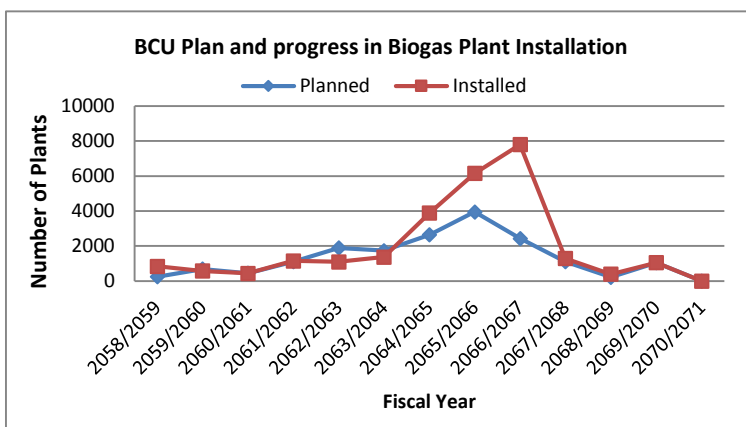
There are a total of 2,90,509 plants ranging from 4-20 cubic meter capacity are installed in Nepal during fiscal year 2049/50 (1992/93 AD) to 2069/70 (2012/13 AD) under BSP, GSP and NRREP I. The data shows that there were 3,318 plants installed in FY 2049/50 and the highest 22,110 plants in 2069/70. There is almost smooth increase in plants installation except notable falls in 2061/62 and again in 2064/65. The number of biogas plants is the maximum 21,888 plants in Makwanpur district while there no biogas plants in Manang. (*Annex 8: Number of Biogas Plants by District*).



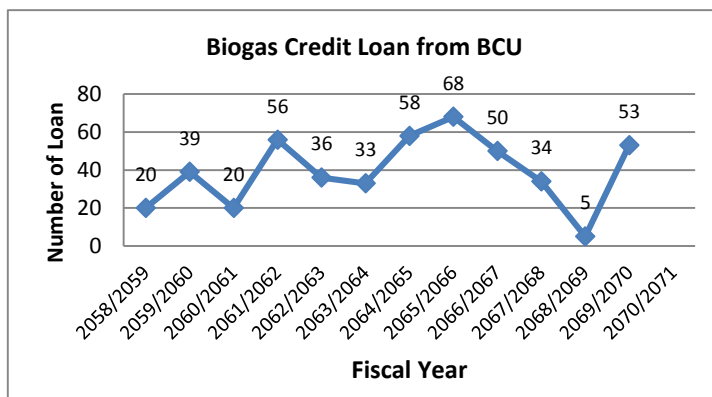
AEPC has provided a total of Rs.3,000,859,300 subsidy to install the plant. In addition to this, the users have invested on biogas in cash or borrowing form financial institutions. The data shows 72% of the plants were constructed in cash and the rest in loan. (*Annex 9: Investment on Biogas Plants – Subsidy, Cash and Loan*) Ratio of plants installed in Cash to total plants is increasing almost steadily starting from 6% of the total plants in 2049/50 to the peak (99%) in 2069/70. This shows that financial institutions have deteriorating contribution in biogas financing.



BCU plan and progress in installation of biogas plants shows that progress had fall short than the planned number in 2062/63 and

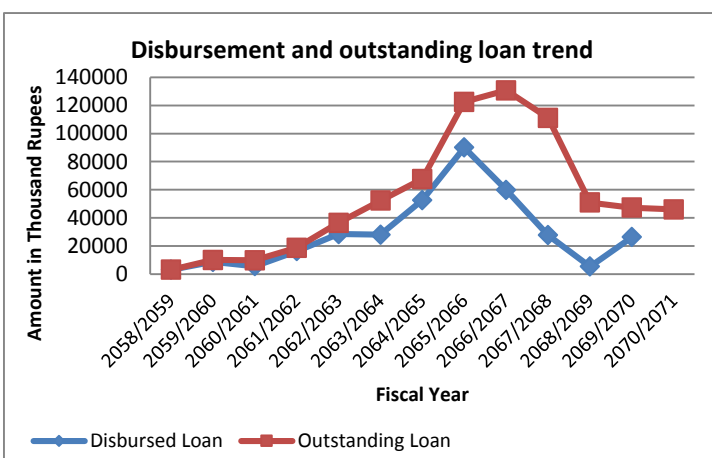


2063/64. But there number of installation seems increased at increasing rate and faster than the plan till 2066/67. Number of installation had a heavy fall from the date and closer to the plan in recent years. This shows heavy mismatch of plan and progress in the past but the figures are equal in 2069/70 with fall in number of annual installation compared to the past performance. The data shows that a total of 26,016 biogas plants were constructed during 2058/59 to 2069/70 with BCU support. (See Annex 10: BCU Progress by Fiscal Year 2069/70)

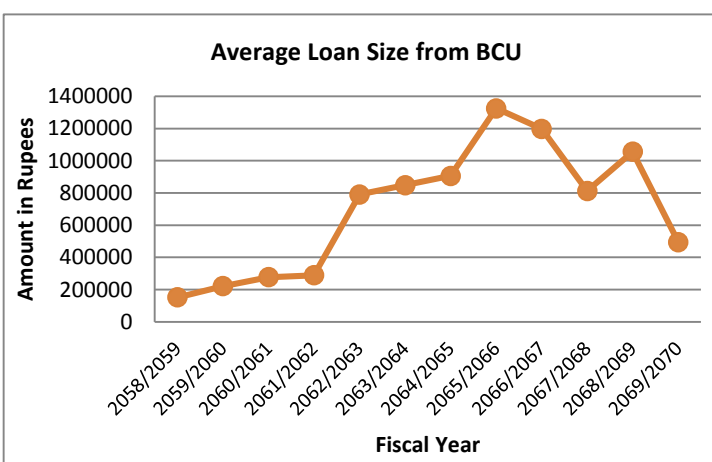


Biogas Credit Unit progress report shows that the unit has disbursed a total of 472 loans to financial institutions for biogas.

Amount of loan disbursement for the same period from the BCU shows Rs.3,037,500 was disbursed in FY 2058/59 and the highest amount (Rs. 9,00,58,096) in FY 2066/67. Disbursement starts to fall from the peak continuously till 2068/69 and again started to increase in the following year. Gap of disbursement and outstanding loan is increased from 2065/66 when disbursement started to fall. Outstanding loan figure reached the peak (13,06,88,114) in 2066/67 and started to fall till the recession period in 2068/69. The disbursement and outstanding figure are closer in recent dates as AEPC has been collecting the past loans and also disbursing new loan.



The data also shows that Average Loan Size to the institutions in falling trend after 2064/65. This means the larger financial institutions are not motivated to continue AEPC loan for biogas after 2064/65.



Portfolio quality of AEPC loan shows that overall Portfolio at Risk (PAR) increased continuously from 2065/66 to 2067/68 and reached almost 70%. PAR figure shows that Milk Cooperatives have the lower par compared to other types of financial institutions. Latest figure shows that Development Bank had 100% PAR while nil for the Dairy Cooperatives.

Table 2: Portfolio at Risk (PAR) Trend of Biogas Loan from AEPC

S.N.	Types of MFI	Fiscal year				
		2065/2066	2066/2067	2067/2068	2068/2069	2069/2070
1	Agriculture Coop	41.23	29.03	69.75	71.72	15.1
2	Development Bank	74.43	70.21	89.36	87.8	100
3	Financial NGOs	22.12	10.14	52.67	92.01	45.38
4	Milk Cooperative	17.81	41.32	38.1	0	0
5	Multipurpose Coop	16.66	27.66	71.64	57.58	37.14
6	Other Institutions	11.15	41.02	57.76	61.52	26.42
7	Saving and Credit Coop	12.26	65.51	75.17	57.7	37.18
8	Women Coop	27.13	37.75	54.88	55.65	29.65
Total		29.66	48.86	69.26	64.6	39.86

3.2. Key Institutions/ Programs observation on Biogas Credit

Interaction with the key institutions supporting in biogas financing and promotion in Nepal showed that the institutions provide grant to the government and the government manages such fund as subsidy or loan. The government is fully responsible to monitor the fund. The support organizations conduct technical audits in case of any complains they received regarding utilization of the fund. In addition they provide capacity building and creating linkage between/among relevant actors and multi-stakeholder facilitation to foster partnership.

The institutions are not interested to continue subsidy and about to phase out their support programs in case of biogas as it is expanded in a scale. Secondly, they prefer commercial funding in this sector and don't promote subsidy as it has distorted the credit market. For this, credit should be targeted in the area where commercial fund are not attracted. Operational subsidy approach will be effective for the subsidized areas too.

The institutions focus to implement biogas credit through MFIs, CBO network and vender. Biogas loan should be managed by strong organizations and constructed in bulk at cluster levels to reduce cost of operation – select the venders for at least 25 plants at a time. So, the strengths of the companies in technology should be assessed before assigning them. The companies should be selected based on technical efficiency than price competition. They point out role of private sector in implementation and supportive and regulatory role of government bodies like AEPC. AEPC also need to identify other technical options and research for biogas promotion.

They have evaluated that the strengths of biogas promotion and financing in Nepal is the robust product, private sector and other institutions. Biggest gap is capacity development of MFIs

enabling them to be able to handle and prioritize renewable energy solutions like biogas or Solar Home Systems. The second gap is inter-linking and fostering partnership between the micro credit and biogas sectors.

Similarly, major impact of biogas they observe to the user is that it helps the poor to purchase a modern and clean technology like biogas. Biogas is not just an energy solution but also an agricultural one, as the digested slurry is a much better manure compared to dung. There are clear benefit for other stakeholders, say for MFIs, they get to diversify their portfolio in a sizable amount as the credit amount is substantial in the micro credit range.

They suggest to tie-up biogas loan with income generation activities so as to use the saved time and ensure timely repayment of loan. For this, partnership should be made with organizations supporting livestock and other income generation activities.

Regarding the quality in services provided by the implementations, they suggest for third party evaluation. User's contribution is another important factor in biogas plant installation and credit management. Similarly, capacity development of MFIs and fostering partnership, addressing issues like after-sale service are important. When MFIs do not exist, other options like vendor financing or financing a bundle of biogas schemes in a cluster (to increase the credit size to make it attractive enough for banks). Combining with other agricultural or some other more productive purpose loans will make biogas credit financing more viable, both from the loan provider as well as loan receiver points of view.

3.3. Wholesale Financial Institutions on Biogas Credit

Commercial banks and wholesale microfinance development banks are providing credit to the biogas companies, microfinance institutions and cooperatives that are used in biogas financing. The financial institutions have developed partnership with the local level institutions and shared works as well as benefits in lending on biogas. The biogas companies and microfinance institutions are involved in demand collection and repayment while they are provided incentives from the lenders. The financial institutions have their own financing modality and motivations for biogas financing. They have experience of lending at commercial rate too. Subsidy in loan interest rate by the AEPC fund have de-motivated them in lending on biogas – reducing their portfolio and contraction of their plan for biogas credit. The financial institutions are interested for partnership with the microfinance institutions at commercial rate. They have evaluated biogas as commercially viable technology. Status of their loan on biogas is summarized by theme as follows:

Financing modalities for biogas

Clean Energy Development Bank: As the AEPC supported institutions provided loan at around 2-3 percent to MFIs and CEDB has cost of fund around 8%, CEDB could not work through MFIs. But as Bio-gas is regarded one of the major products, CEDB developed Vender Financing modality and partnered with 3 bio-gas companies namely Public Bio-Gas Company, Sana Kisan

Bio-Gas Company and Pragati Bio-Gas Company. Pragati Bio-Gas Company has supported more in scaling-up of bio-gas loan that has reached to 650 bio-gas plants in total.

CEDB provides Bio-gas loan to companies to manufacture plants. The companies search for potential users of bio-gas and collect loan requests from individuals in the loan document format developed by CEDB. CEDB reviews the loan applications and provides loan in the name of the individuals. The company is responsible for documentation of the loan and provides the documents to CEDB. The company is also responsible for repayment of the loan.

So, there are two types of Bio-gas loan:

Model 1: Bio gas loan to the Companies: to manufacture bio-gas plants and based on their collateral.

Model 2: Bio-gas loan to the individual users through the Companies: the company collects loan demands; and monitors and collects installments from individuals. The bio-gas plants are taken as collateral. The individual borrower repays the loan installments to the company and the company pays to CEDB. CEDB monitors the documents to check whether the loan is actually provided to the real borrower, repayments etc. It has benefitted CEDB with increased volume of business and low defaults while the companies are benefitted by increased sale of their plants. CEDB provides loan at commercial rate to the companies and also supports some administrative costs by which it is still able to compete with MFI bio-gas loan with AEPC subsidy.

Bank of Kathmandu: Financial institutions lend to biogas users in partnership with rural and local microfinance institutions or cooperatives. The local institutions are assigned to monitor the loan and get incentives in return. This modality benefits the lending institution with increased portfolio while serving the rural communities and also the monitoring cost is reduced as the local partner monitors the loan. The local institution also benefits as it gets incentives while serving their own people.

Bank of Kathmandu had piloted this modality in partnership with Karnali and Sahara Nepal Cooperative in Jhapa district. In Karnali, first loan was provided to 20 HHs for biogas as recommended by the cooperatives. In this modality 6% of the loan disbursed was deposited by Karnali in fixed account as guarantee where BOK provided certain interest. They worked in partnership modality where they shared 50% of the processing fee; provided 46% of interest income; and Rs.75/plant/year for monitoring the loan. This was repeated for the second time too. Later on, Karnali and Sahara were interested to lend themselves by borrowing from commercial banks (wholesale lending) so as to increase their interest income.

After the revoking of partnership the cooperatives started facing repayment problems in biogas loan mainly due to lack of lending on supportive income generating activities together with biogas loan to the clients. BOK is still interested to invest on biogas by both modalities Rural financing or Wholesale lending Through MFIs. Biogas Support Program (BSP) has informed BOK that cooperatives have demand for bank loan for biogas. But the previous partners are reluctant to continue lending on biogas as the previous loan defaults are still not recovered.

Rural Microfinance Development Center: RMDC provides wholesale loan to MFIs including registered MFDBs, FINGOs, Cooperatives in two modalities in general. But there is no specific modality for biogas financing.

Modality 1 – Group model: Mainly in Grameen model (majority) by MFDBs, FINGOs, cooperatives and Muktinath Development Bank. Other different types of groups like that developed by Heifer, Women Development Office, small farmer cooperatives etc. are provided collateral free loan in group guarantee. There are more than 12 lakh members in this various group model.

Modality 2: Microenterprise loan. In this modality both group as well as individuals is provided loans. This loan is specifically targeted to the graduated clients for enterprises.

Sana Kisan Bikas Bank Ltd.: SKBBL is wholesale lender that provides three types of loan products – General microfinance, Livestock, and Youth Self-employment Bank that are specified by SKBBL. SKBBL loan products are not standardized according to normal loan product features. Hence, they have 34 types. 60% of the loan is for general microfinance, 3-4% in youth self employment and the rest (36-37%) for livestock. Main window of SKBBL is general microfinance but the latter two are only to support the government programs.

The SFCL structure includes Board of Directors; 9 sub areas in the VDC; and ward committees in each ward. Individuals interested for biogas/solar loans apply at the ward committee through group and the BOD approves for lending. SFCL submits annual demand to SKBBL and ask for loan. SKBBL collects details of lending from each SFCL. SKBBL provides loans to other cooperatives too, however, the bio gas loan is exclusively provided to SFCL.

Lending Policies:

There is no specific policy of BOK on biogas. But as BOK identified that the local community best monitors the bio gas loan, Rural Financing Modality was used. To sum up, this modality is a partnership modality with the local community institutions for close monitoring of biogas loan. On the other hand, Karnali has provided corporate guarantee to repay the bank loan. It means the local institutions can get incentives in case of good repayment but need to repay loan in case of failures.

CEDB has realized bio-gas loan as one of the important products. For this, CEDB has developed vender financing model. Bio-gas is commercially feasible technology.

RMDC too does not have special biogas loan product, but provides biogas loan to the graduated (1-2 years) members of partner MFIs and lend according to MFI policy. There are no special conditions but guides the MFIs for small installment and long term loans to the graduated clients.

SKBBL in general loan, does not discriminate between SFCL and other cooperatives. SKBBL make assessment of the cooperatives. Each cooperative that fulfills eligible criterion such as at least 40% women; capital adequacy ratio of at least 8%; positive net worth; OSS more than

115%; functioning at least from 2 years; BOD and staffs should not be defaulters; regularly audited; regularly conducting AGM; and so on. The amount of loan depends on amount of internal resources and shares. SKBBL can lend up to 12 Crore to new partner cooperatives. SKBBL has graded SFCLs in four categories A, B, C and D. and provides loan according to the specified rules for these categories. SKBBL provides technical assistant to SFCLs so that they upgrade from D grade to A. SFCLs are lending on biogas, solar and ICS in energy sector. From 300 SFCLs at least 211 are financing bio gas. They had biogas loan component and a defined procedure for lending on biogas and that is continued by SKBBL too.

Capacity building agenda:

The financial institutions studied have no program for capacity building of the local institutions or the users regarding biogas. RMDC and SKBBL organize training to their partners on different aspects of microfinance but they don't explain specifically on biogas use and financing aspects. Each of the institutions visited expressed need for biogas technical training or develop local cadre for after sales services eg; maintenance that supports well functioning of their plant and hence they will be motivated for timely repayment of the loan. At the same time, they expressed that AEPC can use their forum eg; center chief meetings for loan appraisal to educate the local institutions and biogas users on benefits, cost savings and other importance of bio gas and systems of biogas plants.

Lending on biogas:

The commercial banks and wholesale lenders had provided fund earmarked for biogas in the past too. They used to charge at commercial rates to their local partners and the local partners used to lend to their members with certain service charges.

Bank of Kathmandu used to provide deprived sector loan at 12-13% up to previous year. And there was demand too for this product. But now it is around 8-9%. As the current deposit rate is around 10%, they are reluctant for this product, which is not yielding even to the level of meeting cost of the fund.

RMDC has special provision for hill and mountain. RMDC provides soft loan (2% interest) amounting up to Rs. 10 Lakh per branch for MFIs operating in 19 districts that are prioritized by the government. RMDC also supports training to small MFIs in rural areas, covers training costs of the institutions, etc. But there is no special provision for biogas.

Proportion of biogas loan is very low compared to the total portfolio of almost all financial institutions. BOK had invested less than one percent of its total portfolio in bio gas which has even gone down to all most zero level.

CEDB has increasing trend of lending in biogas plants with more focus in the hill area by amount of loan disbursed. CEDB provides loan for 3 years at 14% interest and additional 1% service fee and 3% penalty. Though the proportion of lending to the total portfolio is less than one percent, there is full repayment.

Table 3: Biogas lending from Clean Energy Development Bank

SN	Details	Chaitra End, 2069	FY 2068/69	FY 2067/68	FY 2066/67	FY 2065/66
1.	No. of Plants	616	616	472	263	72
2.	No. of loan	616	616	472	263	72
3.	Amount disbursed					
a.	Hill	8,570,000	8,570,000	5,645,000	1,345,000	-
b.	Terai	5,000,000	5,000,000	5,000,000	4,910,000	1,810,000
4.	Loan Size (Range, average)	20,000 – 30,000	20,000 – 30,000	20,000 – 30,000	20,000 – 30,000	25,000 – 30,000
5.	Outstanding loan amount (Individual)	3,880,000	6,224,000	6,566,000	5,070,000	1,668,000
6.	Outstanding loan amount (Company)	9,091,000	4,711,000	9,621,000	7,590,000	
7.	% of total portfolio on Bio-gas	0.22%	0.24%	0.40%	0.38%	0.07%
8.	Repayment Rate	100%	100%	100%	100%	100%
9.	Default Rate	0%	0%	0%	0%	0%
10.	Term	3 years	3 years	3 years	3 years	3 years
11.	Interest Rate	14%	14%	14%	12%	13%
12.	Fee and other costs charged	1%	1%	1%	1%	1%
13.	Penalty provision	3% penal	3% penal	3% penal	3% penal	3% penal
14.	Repayment method	EQI	EQI	EQI	EQI	EQI
15.	Beneficiary HHs	616	616	472	263	72

Source: Clean Energy Development Bank

Besides these figure, CEDB has disbursed Biogas Loan worth NPR 1,700 thousand to Pragati Gobar Gas Sewa Kendra for the construction of biogas plant. They have been involved in the construction of biogas plant from the fund of NPR 1,700 thousand of CEDB. Thus, CEDB is expecting additional 70 biogas plants to be added within 1-2 months. The table above details out on CEDB investment on Biogas by April 2013.

Quality of loan in different modalities:

Management efficiency of partners companies of the financial institution is generally found as the deciding factor for the quality of loan portfolio. Some new local institutions are efficiently managing their loan and repaying on time. As the company is not usually expert in fund management, the performance of company affects level of utilization of the fund. Sometimes the company may regularly repay the loan while they might not be able to collect from the individual users. In the meantime there is also a chance of regular repayment by the users to the company but the company may not repay loan to the bank. So, CEDB has realized risks in lending more on a single company and thus has strategy to minimize risk by providing loan to multiple companies.

Though RMDC does not have specific modality for biogas financing, they have experienced good repayment of group model compared to microenterprise model. This is mainly because of

good financial discipline maintained in group model as the group of 5, and the center (8 groups) monitors the loan closely and then by the field and branch staffs. In a center, there are 8 group-chairpersons, one center chief and one deputy chief responsible to monitor loan. On the other hand, microenterprise loan to the individuals are generally provided by the cooperatives and the loan committee of the cooperative and the field staffs monitor such loan. Group model is collateral free and repayment of loan is ensured because of group pressure and group repays in case the individual borrower does not repay. Similarly, the individual borrower is responsible for repayment in microenterprise model which is backed by collateral. Microenterprise loan ceiling is 60,000 in MFIs in general and 1,00,000 in some large MFIs. Finally, group based and women led institutions have good financial discipline. Their performance depends on their needs and interests.

Partnership with the vendors/biogas companies is easier as they are available almost in each village, especially in terai, they can make the biogas.

Subsidy fund:

The commercial banks are not receiving any subsidies for biogas financing. They have lent on biogas portfolio at commercial rates. But as they don't disaggregate their loan for biogas, the actual amount of lending on biogas is not recorded.

Previous RMDC project Rural Microfinance Project (RMP) supported by ADB had subsidy. Now there is no subsidy from RMDC after the phase over of the project. RMDC is in favor of subsidy free market. RMDC charges interest on wholesale loan to the MFIs based on the cost of the fund that varies by sources. Nevertheless, RMDC lends at market rate but the rate is still slightly lower at RMDC than at the market because of the previous subsidy reserves of the RMP. This applies for biogas purposes too.

Motivation for biogas financing:

Despite the less return on their loans on biogas, most of the financial institutions are still interested to participate in biogas financing. In case of BOK, BOK has seen opportunity of diversifying their portfolio, and also wants to continue the success of the pilot project. Similarly, RMDC is interested in biogas financing to meet need for bio gas to the graduated members to improve living standards along with their increased income.

Initially CEDB had focus on hydropower but as it was realized that more decentralized systems have higher impacts to the people, bio-gas financing was started to diversify the clean energy products. Secondly, bio-gas and solar are potential in the rural areas as electrification is still not reaching the scattered rural areas and fulfilling their energy demands. Another motivation is to work in the deprived sector with innovative technology.

Plan for biogas promotion:

In general, the financial institutions don't have specific plan for biogas financing. But, their partner organizations are the key decision makers and planners on extending biogas outreach.

BOK has conducted informal meeting with BSP to expand biogas in the hills and in urban areas using waste in Kathmandu. But no specific plans have been designed so far.

SKBBL organizes vision workshop around mid Jestha every year where major SFCLs participate to make their strategies and annual plans. This year SKBBL has developed a strategy and budgeted to focus to plan for ‘What are the activities you plan to benefit your members on health and environment?’ With this, SKBBL can provide information on biogas, solar, toilet etc in next year’s report. SKBBL has prepared a separate proposal for Clean start project. Even if the proposal is not approved, SKBBL has shown interest in promoting ICS and Solar in partnership with AEPC. As the past experience shows high investment is needed for biogas and because of lack of data to decide on biogas, SKBBL has a plan to pilot test to provide 150 biogas plants by the end of 2013 and targeted to make 750-900 biogas plants within 3 years. Main focus of the pilot test will be 49 districts of mid hill, low hill and terai.

CEDB is thinking to scale up vender financing with more venders. CEDB is in a process of finalizing the idea on exploring sources of funds and options to compete with AEPC subsidized program and build partnership with MFIs in bio-gas financing. There is no specific area and target in biogas financing as that depends on the work area of the partner company.

Obstacles in biogas financing:

The study team’s literature study and interviews conducted so far has indicated that the main reason of the commercial banks and wholesalers for not providing loan to biogas is competition with AEPC soft loan. They think that AEPC’s role is to make policy and not to provide loan and subsidize. This has affected many commercial banks lending to biogas. Commercial rate fund is not suitable for bio-gas as the cost will be high when the financial institutions borrow at 12% and lend at 18% and it doesn’t have direct linkage to income generation. The financial institutions claim that bio-gas is a commercially feasible technology and even cheaper than the firewood. Subsidies are not necessary as the private sector can manage this – specifically in the accessible areas. So, subsidies should be provided only for remote areas where financial institutions are not accessible. AEPC should better to manage subsidy through a separate window only to some special areas that are not commercially feasible.

The views of the financial institutions are such that the venders are doing well but it would be more effective if commercial loan is provided through MFIs. But subsidized credit is not necessary. The commercial banks have regarded MFIs and local cooperatives as the best options to reach biogas at the grassroots levels but management capacity of the institutions need to be well assessed. They opine that MFIs can be motivated with incentives for timely repayment. For example, in the existing situation, a whole seller gets fund at 10-11% and lends with around 3-4% margin to the retailer, retailer take margin around 4% and the user is ultimately charged around 18%. But if we take total 6% margin and provision conditions for 20% interest in case of delay in repayment and also get 50% discount for timely repayment, this will motivate the users for timely repayment.

The financial institutions have some de-motivation in lending on biogas as default cases may increase when the user stops repayment when there is problem in its functioning.

High operational cost and scattered settlement has made problem in extending outreach, grouping, economic activities and hence low IGAs. etc. in microfinance operation the hill and mountain including biogas service delivery. Promotion of local microfinance institutions with their capacity building and providing fund from commercial banks will be suitable option to overcome accessibility problem. MFI financing provides additional credit access and offers other opportunities. So, this financing model through MFIs will be sustainable. Similarly, available technologies are not so suitable to the hill and mountains to deliver raw materials management. So, new technologies with light materials and digital systems should be introduced to make transportation easier and thus will be useful in remote areas.

Similarly, strengths of local partners to manage their own fund or alternative subsidized fund for biogas have reduced loan transaction from the commercial banks and wholesalers.

Government announcement to write-off SKBBL loan is another obstacle to the financial institutions that would distort the market and be against the financial discipline. It has encouraged the borrowers to wait for another such announcements and don't repay the loan.

Unhealthy competitions among the lenders have also confused the users and negatively affected in lending. The whole sellers are not interested to compete to the primary cooperatives to borrow from the same source (BSP) at same rate. The whole sellers understand their role to promote the local financial institutions and they expect special provisions for their participation eg; in CREF or BSP fund.

The wholesale lenders have estimated the MFI level obstacles in lending on biogas as limited demand for biogas loan because of easy availability of firewood and hence limiting transactions of the local financial institutions, lack of proper tie-up of biogas loan with income generating activities to ensure timely repayment, training and motivation to the users on biogas with its health impacts, costs savings and using biogas etc.

The wholesale institutions have also realized subsidy dependency is another issue for biogas promotion. They have evaluated that the users value subsidy whatever small it may be in amount but they have also observed that a MFI receiving the deprived sector fund from the wholesalers and also from the AEPC subsidy has repaid the former smoothly while not the latter.

Partnership for biogas promotion:

The financial institutions are eager to extend biogas financing in partnership with local institutions. RMDC is interested to increase outreach in un-reached area, specifically in the hills, with all types of MFIs specially the local cooperatives while BOK is interested to renew the previous partnership.

Additional suggestion by the financial institutions for biogas promotion:

In addition to the above mentioned issues for biogas promotion, the financial institutions participated in the study have suggested to:

- Include after sales services including capacity building of local cadres in maintenances of biogas plants
- Manage for reliable database on bio-gas installation with clear information on use of the service in different location, stakeholders, etc. that will also support in planning and monitoring of the biogas loan
- Despite high cost of operation, the MFDBs and FINGOs should operate in the hill and mountain areas even compensating the operating costs from the earnings from terai and profitable areas
- Work with local institutions specifically the cooperatives.
- Provide ways for cost minimization;
- Provide training/orientation on use and benefits of biogas;
- Train the institutions in rural hill areas on activities other than saving and loan. They have low equity that should be increased
- Provide information on benefits of biogas through the local actors that motivate people to use biogas
- Include toilet in biogas package to enforce people for toilet uses. People don't use the toilet not because they don't have resources but mainly because of dependency feeling and lack of awareness. As toileting is difficult, newly delivered women in terai are provided less food so that she don't need to go to toilet for longer time.
- Subsidy in credit should be provided only for those areas having no access to financial services. The financial institutions can provide bio-gas loan at commercial rates in accessible areas. Recommendation of the study should explain that subsidized fund has negative impact to commercial fund. So, AEPC should identify the better approach and increase penetration with a mix of commercial fund and subsidized fund for bio-gas.
- Scale of plants should be increased. eg; not only 4-6-8 cu.m. plants and based on farm wastage. New technologies should be introduced such as garbage gas etc.
- Allocate resources to areas that checks duplication
- Provision a mechanism for insurance. Though there is not much amount of risks as they are fixed, the flood and natural calamities can affect the plants. So, insurance mechanism for bio-gas will be useful.

3.4. The biogas companies

The biogas companies have partnership with microfinance institutions. They evaluate important role of MFIs that the biogas demand will reduce by 50% if no MFIs. But compulsory membership at the MFIs for biogas construction has problems in many cases. The companies themselves involve in demand collection, motivation on subsidy and loan, contact to MFIs, construction and maintenance works for 3 years.

The companies have problems when the client ask for maintenance after three years, low demand, refunding subsidy amount from AEPC (7 months), high cost of marketing, high costs of retaining staffs, seasonality of work, competition among the companies, managing working capital, and users mis-understanding on the subsidy and cost of materials supplied.

They prefer subsidy management by other institutions such as MFI such that they are involved only in technical works and they are paid by the users immediately after completion of the works. They also point out need for awareness program to the users on technicalities of biogas, subsidy and loan management issues. AEPC should develop specific packages for awareness and train them how to communicate this to the users. In addition, they have suggested to increase human resource at AEPC to monitor and process the files faster.

3.5. Local Financial Institutions in Biogas Credit Delivery

Outreach:

The MFIs found serving 213 - 64,707 members. They have operated starting from one to 383 VDCs and up to 10 municipalities. They are mostly focused in the rural and semi urban areas. Their services have covered 31 districts with 17 districts in the hill in different development regions. They have total outstanding portfolio ranging from Rs.6,00,000 to Rs.1,06,63,26,900 in overall and Rs.24,726 to Rs.1,84,55,506 in biogas.

Financial performance:

The MFIs have credit to deposit ratio of 164.3% in overall. This ratio is higher (315%) for MFDB while less (156%) for cooperatives. This means the MFDBs have less mobilization of internal resources.

Average outstanding loan per borrower in total is Rs.47,598 ranging from Rs.21,776 of FINGO to Rs.54,869 of Cooperatives. This show the cooperatives are providing higher amount of loan to the members.

Delinquency ratio on loan transactions is 3.2% in overall. The FINGOs have the lowest ratio (1.4%) maximum of 8.2% in MFDBs. This shows MFDBs have higher delinquency than the normal standard ($\leq 5\%$). This show MFDBs have more problematic lending.

नेत्री सहकारी संस्था लिमिटेड बँका - ११, भापा			
# २०६३०२१६ संजय #			
रोपर पूँजी	४२२,६४,९००/-	बैङ्क हिसाब	४०६,८९,०२९/०२
कोष हिसाब	६०,२०,२२४/९९	गणानी हिसाब	२०,९९,९००/-
साफ़ी ऋण	२९,६२,२९९/-	कर्मचारी हिसाब	२२,०६,०९,९२४/०९
विभिन्न हिसाब	२९,९८,६९,९९९/९९	अध्यय रकम	९३,९९,९९९/-
अध्यय दायित्व	९६९,९६,९९९/९९	अध्यय रकम	९२,००,६२०/-
आम्दानी	२८,९९,९२९/९९	रुचनी हिसाब	३३,८२,२९९/९९
कुल रकम	३९०८,९८,६९९/९९	कुल रकम	३९०८,९८,६९९/९९

We are Transparent!

Borrowing to asset ratio shows that the MFIs have over 25% borrowing in their total assets. This ratio ranges from 21.4% of cooperatives to 61.6% in MFDB. This show the MFDBs are more dependent on external financial resources.

Average savings per member in the MFIs is Rs.19,918 in overall. This ratio is the lowest (Rs.5,230) in MFDB and the highest (Rs.23,005) in Cooperatives. This show the cooperatives are motivating for higher amount of savings from their members.

Average outstanding loan per staff is Rs.34,84,125 in overall while it is minimum of Rs.19,19,973 in FINGO and Rs.49,13,949 in MFDB. This shows FINGOs have weaker staff efficiency in terms of portfolio turnover.

Average loan disbursed per biogas plant was found Rs.34,293 in average excluding MFDBs. This shows the cooperatives have higher (Rs.34,815) value and FINGO has the less (Rs.27,500). This show the institutions are using internal resources to complement AEPC loan source.

Portfolio at Risk in biogas loan is around 30% in overall, the maximum of 67% for MFDB and the minimum of 23% in cooperatives. This ratio for FINGO is also above 50%. This show the MFI lending in biogas are in high risk.

Governance:

Governance of the MFIs is another important observation of the study. There were MFIs not conducting audit for more than 2 years, conflict among the BOD members has resulted in no audit and political clashes affecting MFI governance. Similarly, management for allocation and monitoring of biogas loan products found not systematic as they rarely have practice of loan monitoring committee or the committees are not functioning properly. This has caused misuses of MFI resources, high dropouts of members and contraction in overall activities and the MFIs are paralyzed.

Products and Services:

The MFIs normally have savings and loan products. Some of them have insurance and remittance products.

The major savings products are regular, time deposit (fixed), voluntary deposits, group savings, child saving, old age saving, women saving, foreign employment, Khutruke, education, center fund, emergency fund, health saving, institutional saving, festival and a number of special savings products around 50 types.

Similarly the MFIs have business, hire purchase, agriculture, enterprise, household, foreign employment, housing, emergency, education, group, staff loan, biogas, youth employment, collateral, against fixed deposit, livestock, general, seasonal, solar, irrigation, special discipline and other special types of loan at institution levels.

Renewable Energy/Biogas promotion policy of MFIs:

The financial institutions normally don't have special policies on biogas promotion. The cooperatives generally have explained the biogas loan products in their credit policy. Some of the institution discuss about biogas loan at meetings or target in annual plan. They have

awareness, training and decisions to promote biogas. The field study has identified some special policies and activities of MFIs in biogas promotion as follows:

Table 4: Renewable Energy/ Biogas policies and activities of sampled MFIs

Name of MFIs	Biogas Promotion policy / activities
Bishwashilo Saving and Credit Cooperative	Loan policy explains on biogas loan - Maximum 25000, 4 installments, 6 monthly, for 2 years, interest rate 10%
Chameli Saving and Credit Cooperative	Policy explain interest rate not more than 16%, 1% discount in advance repayment, Priority for company recommendation, Collateral is not in priority
Grameen Swayemsewak Samaj	Board meeting declare about investment on bio-gas, discuss in different groups about the relation between deforestation and bio-gas plant, environment and alternative energy promotion
Lali Gurans Saving and Credit Cooperative	Plan to shift biogas to solar
Miteri Multipurpose Cooperative	Written minute to invest on bio gas
Paschimanchal Grameen Bikash Bank	Loan policy explain on biogas loan that - maximum of Rs. 60,000 provided per plant/per client,
Ramailo Saving and Credit Cooperative	Loan policy explain on bio gas lending, Solar Tuki used by members, management committee decided to promote solar from this fiscal year with company (Suryodaya)
Sahara Nepal	Loan policy explain on bio gas, provided training to staff on solar and biogas
Shree Deepjyoti Nari Bikash Saving and Credit Cooperative	Wholesale borrowing approved by Board for AEPC
Shree Gaun Shahar Multipurpose Cooperative	No specific policy but plan annually for biogas financing
Solve Nepal	Specific loan policy describing biogas loan demand and approval process
United Development Bank Limited	Written in minute about investment on bio-gas promotion

Lending Modalities:

The sampled financial institutions found borrowing from AEPC at subsidized rate (6%) and lending to the users at 14% interest rate. For this, they apply for biogas loan to AEPC, receive the first installment from the approved amount, disburse biogas loan to the users, report the disbursement to AEPC and then get the next installment.

In addition to borrowing from AEPC, some MFIs have borrowed from other wholesale financial institution for general microfinance loan and lend this fund also for biogas installation. This type of fund is used often at commercial rate (18%) or according to biogas loan policy of the institution.

Notable number (42%) of MFIs also invested their internal fund in biogas mainly as complement to the AEPC credit funded plants and also for separate plants. Such fund was found invested at the same interest rate to AEPC fund as well as commercial rate (18%).

MFIs Marketing Efforts in Biogas Loan:

The MFIs don't have specific practices in need assessment nor significant cases of rejecting loan applications. Generally they provide loan as demanded by the users in their contact. Most of the MFIs (53%) found dependent on biogas companies regarding biogas loan demand collection from the users. Similarly, 34% of the MFIs collect biogas loan demand in groups and individual interaction by the staff. They disseminate information on biogas through AGM, group meetings, annual reports, field staffs and loan officials at the time of loan contract. About



We are Proud of Promoting Biogas in our Area

54% of the institutions have motivated the users for biogas loan. The MFIs generally provide information on price, penalty, term, repayment requirements and benefits of biogas during the meetings.

Regarding priorities in lending on biogas, 50% of the MFIs responded that they prioritize the loan application for lending. Mainly they prioritize according to application date that earlier applicant receives loan first. Similarly, personal characteristics, past loan performance and collateral are decisive factors in lending on biogas loan applications. Some of the MFIs also look on whether the individual has livestock, permanent resident, amount of loan demand and poverty. But the information is often based on the verbal responses. The sample study has found that the client even don't know from which institution they are borrowing. This was possible as the borrower was fully dependent on the company agent in entire process of loan disbursement, keeping the user's book and also in repaying loan installments to the MFI.

Many of the users have installed biogas because of subsidy. Some of the users were found installed biogas plants as they heard that the loan taken from the MFIs are subsidized to the disadvantaged groups including Dalit, Janajati and victims of political violence. Thus they are reluctant to repay the loan. As they are not clear on this, they often ask the MFIs regarding the amount of subsidy but the MFIs too are not aware on the actual amount of subsidy provided by AEPC in installing biogas plants. Some of the MFIs know that the non-local equipments and services provided by the company is the subsidy from AEPC. In addition to this, the MFIs reported that some projects (forest conservation) provide additional subsidy for biogas installation.

Monitoring of Biogas Loan:

The MFIs generally don't monitor biogas loan except in cases of delays in installment repayments. Normally the MFIs monitor biogas plants twice - at the preparation phase and after completion, as it is mandatory to prepare completion report for AEPC. Some of the MFIs take information on biogas loan during group meetings by staffs and group members. Very few of them have formal committee/ responsibility allocated to the staff in monitoring the loan products. Some of the MFIs haven't taken special care to biogas loan as they are smaller in amount and also a permanent structure. Similarly, some of the MFIs are found fully dependent on Biogas Company to monitor and collect installments. Their general processes of follow-up of default loan are calling, visiting and written communications for repayment. The MFIs have even reported such cases in DDC/EED to take action while some of them have extended the grace period, discussed in meetings, provisioned for penalty etc. to motivate for payment of overdue loan. Despite having special mechanism to monitor biogas loan, more than 80% of the MFIs are confident that the fund is used in biogas construction. Only 27% of the MFIs have aging practice regarding biogas loan.

Motivation of local financial institutions in lending on biogas:

The MFIs found motivated on biogas loan transactions due to various reasons. The principle reasons to be interested in biogas lending are subsidized interest rate, client benefits, increase in membership, enhanced linkage, goodwill and social responsibility. They get soft loan from AEPC at 6% interest and lend to their clients at 14%, which is normally lower than that of other loan products. The spread margin also supports in income of the institutions while serving the clients with cheaper credit. The MFIs are found also motivated to introduce clean, healthy, and cheap energy option to the clients. Similarly, many clients join MFIs for the sake of biogas loan. It benefits the MFI with increased outreach and providing additional services to them. Biogas loan also supports MFIs in linkage development with other institutions that can be valuable in other activities of the MFIs. The MFIs are also continuing biogas loan to maintain their goodwill among larger number of people. Some of the MFIs not motivated in the spread margin found motivated because of goodwill and social responsibility feeling to preserve the environment and benefit the clients.



Our institution and clients are benefitted by Biogas loan

MFI Plans for biogas promotion:

Only 42% of the MFIs revealed some plans for biogas promotion in future. Some of the MFIs have planned on number of biogas plant installations in their annual plan. Otherwise, their plan are verbal and contingent. The study shows that 23% of the MFIs have their plans to increase the

number of plants, 15% to expand work area and about 4% to increase amount of loan per plant. The MFIs planning for biogas promotion are mostly interested to continue partnership with AEPC mainly because of subsidized loan. But some MFIs found interested in partnership with other sources of fund and new biogas companies.

Problems of MFIs in Biogas Financing:

The MFIs have revealed their problems in biogas financing mainly in due to services of the biogas company, repayment, managing different interest rates, right targeting, managing fund for supportive business, delay in receiving reimbursement from AEPC, inadequate support from AEPC, higher costs of operation for the hill area, public announcement on free loan and subsidy to disadvantaged groups and monitoring loan in scattered settlements.

The clients often complain on the quality of construction and problems in maintenance by the companies. The company technicians are neither in contact with the users when required nor available when called. Similarly, the users are not clear on the value of services provided by the company and amount of subsidy spent. So, the users complain the MFIs by telephone or visit regarding these issues associated with biogas companies. The MFIs often communicate the user's problem to the company. Association among the companies has also limited MFIs to work independently. But this has affected in timely repayment of loan installments too.

MFIs have pointed out completion among the companies to hold the potential users.

The MFIs have problem in providing loan on biogas at different rates when they exceed AEPC quota. The field study found that some MFI in saturation of the quota are demanding biogas to the members in name of other MFIs. In such case the MFIs often provide loan from internal fund or other sources at higher interest rates as per cost of the fund. This variation in interest rate has made the MFIs problems to communicate with the clients.

Similarly, the MFIs have problem in managing fund for increased demand for biogas as the cost is increased. The users also demand loan for livestock and other supportive enterprises but they are unable to manage fund for such businesses requiring high amount. This also reflects weakness of the MFIs in linkage development and exploring the potential sources.

As the MFIs are highly dependent with the biogas companies in demand collection and loan facilitation, they have difficulties in identifying their needs and monitor loan utilization.

The MFIs also expressed that they are facing difficulty in timely release of installments from AEPC. As AEPC provides them next installment based on plant completion report and this is dependent on the reports from the company, delay from the company and delay in processing at AEPC has affected in timely release of the installment. The MFIs are feeling the loan process from AEPC is lengthy. They expressed that AEPC asks for a long list of documents while applying for biogas loan. It is observed that AEPC requires 17 types of documents for this purpose. The MFIs have expenses and time consumed in receiving these documents.

Table 5: Documents Required for Biogas Loan from AEPC by Financial Institution

S.N	Documents to be submitted to AEPC for Biogas loan	New/Additional Loan
1.	Biogas loan application form in AEPC specified format	Both
2.	Attested copy of Institution Registration Certificate	New
3.	Attested copy of renewal of Institution Registration (For NGOs)	Both
4.	Attested copy of the Institution's Bylaw	New
5.	Attested copy of Management Committee Decision (clear on number of plant and loan amount demanded) to borrow from AEPC	Both
6.	Mandatory to submit the attested copies of Audit Report (including the profit and loss, balance sheet, income statement etc.) of the institution for the past three years for new loan and two years for additional loan.	Both
7.	Mandatory to submit reference letters from Dairy Producers Association for Dairy Producer Cooperatives and from District Forest Office for Forest User Groups	Both
8.	Reference letter from Division Cooperative Office (for all cooperatives)	Both
9.	Conduct a biogas installation feasibility study in the work area of the institution and attach the study report in Demand Collection File.	Both
10.	Mandatory to attach reference letter in the format provided by AEPC to the DEEU/S	Both
11.	Mandatory to attach reference letter in the format provided by AEPC to the NBPA Regional Office	Both
12.	Reference letter from the Regional Service Centers (RSCs)	Both
13.	In case the applicant institution has borrowed from other institutions, it is mandatory to submit the reference letter from lending institution with explanation on status of loan.	Both
14.	Reference letter from the Central/ District level Cooperative Union is mandatory for the subjective cooperatives applying for biogas loan	Both
15.	Attested copies of PAN and Tax Clearance Certificates of the last fiscal year	Both
16.	Attested copies of citizenship certificate of the Directors	Both
17.	Collective self-declaration from the directors on not being Black Listed by Nepal Rastra Bank or the government	Both

This shows the documents need to be reviewed on whether they are essential or not. Almost half of the documents are on receiving references and they are especially problematic for the MFIs.

Similarly, the MFIs have difficulties in monitoring from AEPC. The MFIs expressed that AEPC always asks for loan repayment but have inadequate support in capacity building of MFIs so as to minimize potential defaults.

Serving in the hill area has problems of transportation, cost of operation, low income of the people, and problem in gas formation due to technicalities etc. The MFIs normally take 7-30 days for loan processing while that is less in the terai area.

Public announcements on freeing loan such as from ADB/N and unclear message on subsidy to the disadvantaged groups has created problems in repayment of loan. Similarly, donor funded

projects are also affecting in promotion of biogas through the MFIs as they are subsidized by the projects.

Scattered settlements are also obstacles for MFIs in biogas loan marketing and monitoring.

MFIs Understanding on User Level Benefits and Problems of Biogas Loan:

The MFIs have also evaluated the user level benefits and problems on biogas loan. The users are benefitting from the loan mainly in cleanliness, easily handled even by children, reduced expenses on cleaning clothes, environment improved, health improvement, more effective fertilizer, time saving, economy in cooking fuel, cheaper credit availability, income increased by supporting business, solved firewood availability problem and constructed toilet. So, the users with biogas are feeling happier and social prestige improved.

Similarly, user level problems realized by the MFIs are lack of awareness on and realization of subsidy, functioning of the plants, availability of maintenance, delay in construction, flood problem in terai, alternative business to repay loan, compulsory to rear livestock, etc.

Diversification needs in Biogas Loan Product:

The MFIs suggest for need assessment for proper targeting of the clients. Similarly, the users should understand well on the need, subsidy provisions, loan process, handling of the plants etc. before sale. Proper regulation and monitoring is required in selecting companies to reduce transparency and maintenance problems. Regularity in maintenance services is most important. Similarly, the biogas loan should be backed up with the collateral that is valued to the clients. Biogas loan should be tied up with supportive businesses ensuring income to repay the biogas loan. Some of the MFIs have proposed for increasing amount of subsidy and reduce interest rate on biogas loan, specifically for the hill and mountain while some have proposed for rewarding schemes for timely repaying clients.

Evaluation of Subsidy by MFIs:

The MFIs have evaluated on the subsidy provided to the users of biogas plants. The subsidies have made the loan cheaper, increased number of plant installation, motivated for timely repayment, provided access to fund to the disadvantaged groups and benefited the users and the community. On the other hand, the MFIs have pointed out less transparency and unhealthy competition among biogas companies in subsidy management, increased subsidy dependency among the users, subsidy expectation in other loan products too and distortion of microfinance market.

3.6. Users experiences in Credit for Installation of Biogas Plants

General profile of the biogas users:

The sampled users of biogas found mostly affiliated to the MFIs for 2-5 years (43.3%) followed by 6-10 years (33.3%). Most (73.3%) of the users found continuing the membership at the

financial institution after borrowing for biogas while 23.3% had discontinued the relation after repaying the loan they had taken for biogas. Only 83.3% of them were found using savings product of the institution they had take loan. This tendency was found higher among the users who were motivated for biogas loan by biogas companies.

Farming is the principle occupation of almost users while foreign employment (3.3%), business (5.1%), enterprise (1.7%) and other jobs (5.1%) are secondary occupations of the sample households. Gulf countries (UAE, Baharain, Dubai, Kuwait and Qatar) are major destination for foreign employment while some are employed in India. Most of the households (53.3%) have 6-10 members while 43.3% of them have 3-5 members. Almost half (45%) of the household spend Rs.1,00,000 to Rs.2,00,000 per annum in cash for household needs while 35% spend Rs.2,00,000 to Rs.5,00,000 and 16.7% spend below Rs.1,00,000. Cash expenses on fuel for cooking are below 1% of household cash expenses in most (61.7%) of the households while it is above 5% in around 13% of the households.

Affiliation with the Microfinance Institutions

The institutions studied were grouped as Microfinance Development Bank, Cooperative, Financial Intermediary NGO, non-formal savings and credit groups and other financial institutions. Affiliation to financial institutions showed that the users found involved in one or more types of financial institutions in their area.

Affiliation to such institutions is comparatively higher in cooperatives (average 1.7 member per household) followed by FINGO (average 1.4 member per household) and non-formal groups (average 1.4 member per household) including affiliation of same member in different institutions of the type or different members in the same institution. Similarly, per household found saving the maximum average Rs.517.5 per month ranging from Rs.5 to Rs.7000 at the cooperatives. Total accumulated savings of the households at the financial institutions also shows higher amount of household savings at the cooperatives and non-formal groups. This shows that local financial institutions, specifically the cooperatives and non-formal groups are popular among biogas loan users to save their money.

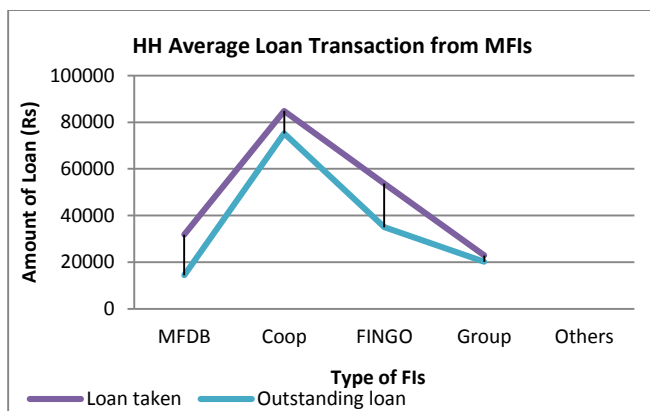
Table 6: Cooking Fuel Cost compared to Household Expenses

Ratio of Cost of Cooking Fuel to Household Expenses (%)	Percent of Households
<= 1.00	61.7
1.01 - 5.00	25.0
5.01 - 10.00	1.7
10.01 - 15.00	6.7
15.01 - 20.00	3.3
20.01+	1.7
Total	100.0

Table 7: Biogas users affiliation and transaction with Local Financial Institutions

Type of FI Affiliated	No. of HH members	Monthly saving per HH	Total saving per HH	Loan taken by HH	Outstanding loan of the HH
MFDB	1.3	440.4	5400.0	31875.0	14428.6
Coop	1.7	517.5	17401.5	84819.4	75188.8
FINGO	1.4	148.3	10778.7	53750.0	35000.0
Group	1.4	144.4	19751.7	22936.4	20200.0

This shows that the users have higher transactions with cooperative and the FINGOs have wider gap in total lending and outstanding loan while that is least in groups.



I have two biogas plants

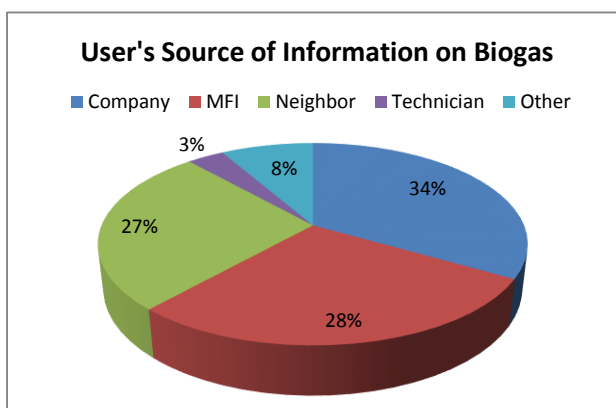
Installation of Biogas:

Generally the household found installing one biogas plan per household except one case found installed two plants in the same house to meet the energy needs. Most of the plants (74.6%) were sized 6 cu. m, meaning that they are popular both for terai and hill. There were 8.5% plants of 4 cu.m and 15.3% plants of 8 cu.m. in terai. Similarly, there were no plants of 8 cu.m found in the hill. Majority (85%) of the users are satisfied on the size of the plant they have while two of the plants were found not in operation and additional 10% of them were not satisfied in this regard.

Table 8: Biogas plant size by geography

Cubic Meter	Size of bio-gas plant			Total
	4	6	8	
Terai	8.5%	57.6%	15.3%	81.4%
Hill	1.7%	16.9%		18.6%
Total	10.2%	74.6%	15.3%	100.0%

Biogas companies are the principal sources to inform the users (34%) on biogas. They visit the households in course of promoting their business and motivate the users to construct biogas in their households. Similarly, microfinance institutions inform the users in their institution, group meetings and other programs and motivate for installation. Microfinance institutions found informing to 28% of the sampled users on biogas loan while 27% of them had got information from observation at their neighborhood.



Benefits of Biogas to the users

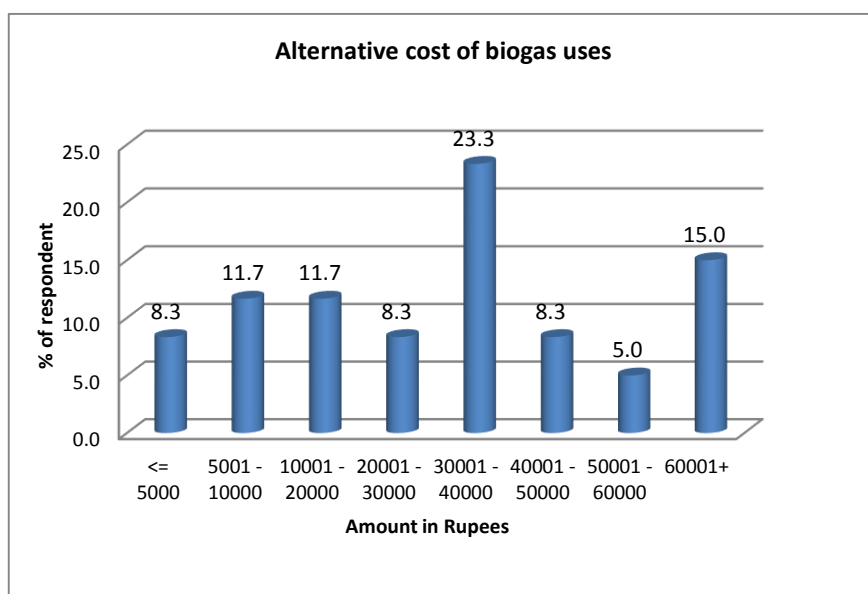
The users of the biogas plants found very much excited to use it. There were no users worried of using biogas. The major causes of their motivation to use the biogas they revealed were

demonstration effect of using the plants at their area; reduce firewood collection problem; smoke free and cleanliness made the kitchen and home environment healthy; proper use of toilet and no need to construct safety tank; cheaper in cost for cooking compared to firewood and LP Gas; easily handled by children and old people; restriction to enter forest for firewood; protection of forest; group solidarity to use clean energy and use modern technology; utilization of animal wastes; time saving; one time investment for longer period and; motivation to get subsidy.



We are really benefitted by using Biogas

Biogas plants users have regarded biogas not only an environment friendly technology but also an economic alternative fuel for cooking. The biogas users responded that they are saving costs of fuel for cooking. Biogas has replaced use of firewood for cooking food. Most (23.3%) of the users reported that the biogas plants have saved around Rs.30,000 to Rs.40,000 of



their expenses for cooking fuel per year. Similarly, about 12% of the respondents expressed that they have saved Rs.5,000 to Rs.10,000 per annum while additional 12% saved Rs.10,000 to Rs.20,000 per annum using biogas to cook food. This shows that total cost of installing biogas plant is merely the cost of cooking fuel for 1-2 years.

User's Participation in Biogas Installation

Most of the households (92%) found involved in collection of raw materials and laboring in the construction period. The biogas companies normally provide one skilled mason and non local materials required to construct the plants. The users participate themselves or pay for digging and filling the pit, support the mason in stone/ sand works and sand filtration. Similarly they had managed for sand, cement, rod, brick and stone. This shows the users are well participated in

construction of the biogas plants. On the other hand the company or local agents found involved in supplying the materials such as sand, brick and stone to the users.

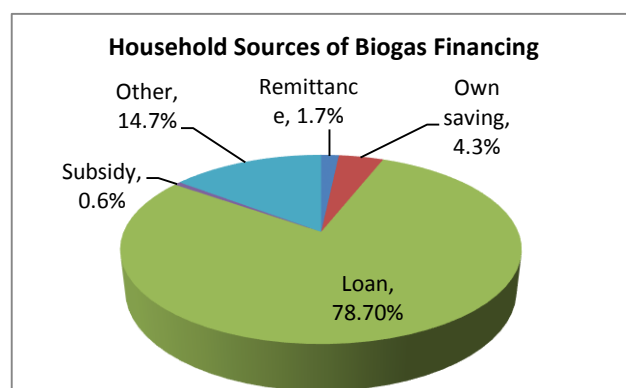
The data also shows that 45% of the borrowers have attached toilet in their biogas plants. They were motivated to join the toilet for more gas production, receive additional subsidy, improve household sanitation and wipe-out cost of constructing safety tank. Similarly, the respondent not attaching toilet in their biogas plants have reasons such as bad smell of the gas at kitchen, hesitation to use the gas by the elder and women, hesitation in carrying the slurry and scarcity of space and money for the construction.



We work for ourselves

Household level sources of financing Biogas

The biogas users responded that they had financed their biogas plants from different sources. Excluding the amount of AEPC subsidy they received as they were not clear on the actual amount of subsidy, loan is the principal (78.7%) source to install the plants. The data shows that the users had used their own savings made at some microfinance institutions that contributed 4.3% of the cost of installation excluding AEPC subsidy.



Similarly, 1.7% of the installation cost was covered from remittance income, 0.6% from the subsidy from development programs and the rest (14.7%) from other income of the households. This shows that loan from microfinance institutions is indispensable factor of installing biogas plants.

Borrowing for Biogas

Majority (90%) of the respondents expressed that they had really needed loan to install biogas plants. The users had preferred borrowing from particular MFI mainly because they were already affiliated to the institution and as per guidance and motivation of the biogas company. In addition to this, the users have felt easy access, cheaper interest than local lenders, and easy repayment system at the MFIs. Encouragement from the group, pressure from the family members, motivation from the MFI, motivation from the neighbor, no access to other MFIs and following other villagers to borrow from the same MFI were other reasons of their borrowing from MFI.

Generally the biogas companies motivate them to use the biogas, borrow from the recommended MFIs and inform that they will get subsidy. The biogas companies manage for all documents such as the collateral documents, filling loan application form etc. required for borrowing from the MFIs. The biogas companies found involved in approving the loan from MFIs and collecting the MFI loan installment too. This has facilitated the users in borrowing from MFIs. On the other hand the users of biogas found heavily dependent on the biogas company in borrowing from the MFIs too. Many of the respondent expressed that the company staff knows better on their loan transaction. The users found confused even on the name of MFI they had borrowed or the name they said was not matching with that on their Users Book. The users were found not well informed on the price, terms and conditions of biogas loan before receiving them. Though the MFIs have to inform the user on basic terms and conditions of loan before sales, only 70% were informed on the terms, 65% on interest rate, 33% on penalty provision and 28% on fees associated. This gap in information on the loan product is specifically associated with company motivated users. This is also associated with high dropout of biogas loan users after they repay the loan.

The second type of borrowing is from the MFI members. This group is informed on the biogas loan product at their group meetings or at the MFI offices by the staffs. They demand for biogas loan at their institution. They are more informed on the price, terms and conditions of the loan as other loan products they use. They are provided credit at the MFI after completing the documentation. They take biogas loan as one of the products of their institution and thus there is no such dropout associated to this type of biogas loan users.

The MFIs are providing biogas loan against some documents. Citizenship certificate (91%), Photo (70%), loan demand form (61%), collateral certificate (48%) and group recommendation (38%) are the major documents required for biogas loan from MFIs. In addition, the users expressed that some of the MFIs require co-signer guarantee, feasibility study, evaluation map, and bond document for biogas loan.

The MFIs generally monitor the biogas plants twice – at the time of lending and after completion of the plants. They observe the preparation works such as digging the pit, collection of local raw materials at the installation phase monitoring and provide the first installment of loan accordingly. Similarly, they ask the users on the completion of the plant and functioning and take photo at post installation monitoring. Many of the plants constructed in active facilitation of the biogas companies are often monitored by the company only. There is no such loan monitoring practice of MFIs after construction – specifically in case of company dominated lending. The MFIs monitor the loan in case of delay in repayment of loan.

The users (28%) informed that they are paying fee to the MFIs to receive biogas loan while most (57%) of them don't pay and 15% are not aware whether they pay fee or not. The fee they pay ranges from Rs.100 to Rs.300 and Rs.200 in most cases.

Regarding questionnaire on the interest rate they pay for biogas loan, 37% don't know the actual rate. Among those knowing interest rate, 25% answered they pay 14%, while the rest answered

that they pay ranging from 10-18%. These responses are affected the by respondents who had borrowed long time before at lower interest rate and also the users who are receiving loan from internal/alternative funds from MFIs at higher interest rate than that from AEPC fund.

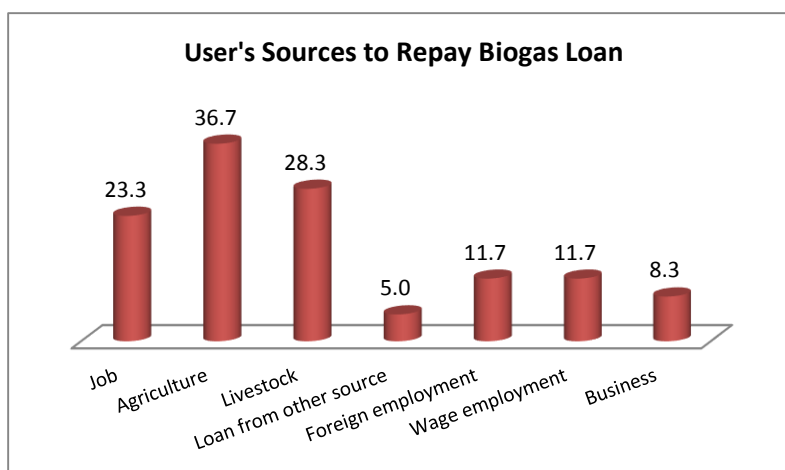
Income from farming, livestock and job are major sources of the users to repay biogas loan. About 75% of the users explained single source to repay loan while rest have alternative sources. Farm income is the principal source (36.7%) followed by livestock (28.3%) and job (23.3%). Similarly, about 12% of the respondents have explained foreign employment and wage employment each as sources to repay the biogas loan. About 8% of the respondents have business to repay the loan while 5% of them have even repaid their loan borrowing from other sources.

Many (36.7%) of the users of the biogas loan found not clear on the installment period of the loan they borrowed. Similarly, many (25%) of them had repaid loan installment in 3 months while 15% of the borrowers had repaid it monthly.

Amount of loan installment shows that most (25%) of the users repay Rs.2,000 to Rs.5,000 (average Rs.3000) per period while 10% of them repay Rs.1500 to Rs.2000. regarding this, 41.7% of the respondents were not aware on the installment amount as they are not actually following this or other members of the family is involved in repayment.

Majority (36.7%) of the users replied that they had to repay biogas loan within two years while 26.7% replied to repay in three years. There are some (13%) respondents not aware on the term of the loan.

Level of awareness among the users on the price, terms and conditions of biogas loan is reflected in to practices in timely



repayment of installment. One third of the users of biogas loan found missing timely repayment of the installments. Some of the genuine reasons for failure in maintaining biogas loan installments are sickness, death, no cash holding, no regular income sources. Some of the respondents even not repaid installment regularly as they spent the money in marriage of their children, the MFIs located far and preferred to repay loan taken from other MFIs. Similarly, some of the users had not repaid loan installment on time as the biogas plant was not functioning and no one from the company and MFI supported in maintenance. A group of five borrowers found not repaying the loan installment as nobody responded them to maintain one of the plants they had constructed. So, proper tie-up with income generation activities to enable the borrowers for timely repayment and proper response to maintain the plants on time is necessary to improve this trend of defaults in installments.

Most (61.7%) of the users replied that they are charged interest as per declining balance principal while 10% of them know that they are charged in flat. This also shows that 28% of the users don't understand how the interest rate is charged on their biogas loan. Similarly, 35% of the users are not aware on the interest rate calculation period while 31.7% know that interest on their loan is calculated on daily basis, 30% know it is monthly basis and 3% know it is calculated on annual basis.

Installment methods on biogas loan from the MFIs as per knowledge of the users shows that 36.7% of them repay loan in equal installment and 41.7% in flexible installment while the rest (21.7%) don't know on the installments.

User's preferences in lending methodology:

Most of the users prefer to borrow biogas loan for a term of 2-3 year and repay the amount in quarterly installment around Rs.2,000 - Rs.3,000 per installment. Similarly, most (65%) of the users feel comfortable in repaying the installment at MFI offices, 23% prefer to collection at home and 8% at their group.

User's problem in biogas

The users have problems in biogas mainly on maintenance. They complain that the stove don't work properly, blockage in gas pipe, no sufficient length of pipe, problem in switch, gas leakages, insufficient gas formation from the plant and toilet jams. Similarly, they have problem in maintenance as the company's services after sales are not effective and the mason are not available locally and timely. Some of them have also felt the plant size are not sufficient to the large family and subsidy is not enough for larger plants. Similarly, some of them have problem in understanding the



Both of us are Plant: Biogas Plant Covered by Green Plants

price and terms of loan, problem in repayment of installments because of low income and worried on longer period to construct the plant as the company hold construction and don't work continuously. Another issue is related to migration and absence of working manpower in the villages that they are forced to continue livestock farming to run the biogas.

The users have pointed out potential obstacles of expanding biogas as poverty to spend on the plants, manage space for construction and not having permanent settlement; lack of awareness on biogas and loan; lacking collateral for borrowing; difficulty to manage biomass as it requires to keep livestock; lack of access to finance; easy access to firewood, wrong messages from the failure plants and not reliable services from the companies. In order to solve these problems and promote biogas uses, they suggest for awareness program on benefits of biogas at microfinance

groups and other community forums; diversify biogas savings/loan product to address the user's needs; provide more subsidy to the poor; close monitoring by MFIs; regularize maintenance services of the plants; tie-up the biogas loan with income generation activities and provide biogas loan against group guarantee than collateral requirement.

User's commitment for biogas promotion

Most of the users of the biogas were satisfied in using biogas and also excited to promote biogas in their areas. They expressed commitment to aware the potential users on the benefits of biogas such as saving environment, smoke free kitchen, easy cooking, good health, improved household sanitation, firewood saving, economic, good fertilizer etc. They imagine supporting the potential users by demonstrating the process to use, guide on borrowing from MFIs, providing biomass at the first time to fill the pit etc.

In addition to this, they point out need of government, MFI and other stakeholders support in biogas promotion. Specifically, the stakeholders should raise awareness on biogas, financing mechanism, biogas loan products, cost saving through biogas and subsidy mechanism. Similarly, some of the users have suggested increasing the subsidy amount specifically the poor; reduce interest on loan; make environment for regular maintenance of biogas plants; monitor/ supervise the quality of equipments and plants pre, during and post construction of plants; manage loan for livestock farming and select good company to construct biogas plants.

4. Conclusions

The study has concluded the followings:

There are a total of 2,90,509 plants ranging from 4-20 cubic meter capacity are installed in Nepal during fiscal year 2049/50 to 2069/70. 72% of the plants were constructed in cash and the rest in subsidy. For this, AEPC has provided a total of Rs.3,000,859,300 subsidy to install the plant. In addition to this, the users have invested on biogas in cash or borrowing form financial institutions. Ratio of plants installed in Cash to total plants is increasing almost steadily starting from 6% of the total plants in 2049/50 to the peak (99%) in 2069/70. Average Loan Size to the institutions is also in falling trend after 2064/65. This means financial institutions have deteriorating contribution in biogas financing and the larger financial institutions are not motivated to continue AEPC loan for biogas after 2064/65. Portfolio quality of AEPC loan shows that overall Portfolio at Risk (PAR) increased continuously from 2065/66 to 2067/68 later on its move towards around 39.86 percent.

In addition to AEPC, commercial banks and wholesale microfinance institutions are important stakeholders in biogas financing. The commercial banks and wholesale MFIs don't have comparative advantages of competing with AEPC subsidized credit for biogas financing. The commercial lenders are still interested to lend on biogas as it is important technology for the rural poor people but they are asking for an environment and policy that defines their role in this campaign. So, their voices are to restructure AEPC role in regulating and monitoring for biogas promotion rather than handling subsidy and loan.

The financial institutions studied have no program for capacity building of the local institutions or the users regarding biogas. Management efficiency of partners companies of the financial institution is generally found as the deciding factor for the quality of loan portfolio.

Subsidy is another important part of biogas financing. AEPC is providing subsidy for the individual users of biogas through biogas companies. The companies provide their services together with some non-local materials required to construct the plants. AEPC reimburses the cost of the materials and services to the companies from the subsidy amount when the companies claim the construction of individual plant is complete. In this regard, the companies have to wait for reimbursement for longer period and thus increased their cost of services. The subsidies have made the loan cheaper, increased number of plant installation, motivated for timely repayment, provided access to fund to the disadvantaged groups and benefited the users and the community. On the other hand, the MFIs have pointed out less transparency and unhealthy competition among biogas companies in subsidy management, increased subsidy dependency among the users, subsidy expectation in other loan products too and distortion of microfinance market.

Most of the users (23.3%) reported that the biogas plants have saved around Rs.30,000 to Rs.40,000 of their expenses for cooking fuel per year. This shows that total cost of installing biogas plant is merely the cost of cooking fuel for 1-2 years.

Table 9: Summary of Lending Modalities and Status of Selected Wholesale Fund Providers

Institution	Lending Modality	Biogas Lending Status
SKBBL	SKBBL loan products are not standardized according to normal loan product features. Individuals interested for biogas/solar loans apply at the SFCL ward committee through group and the BOD approves for lending. SFCL submits annual demand to SKBBL and ask for loan. SKBBL collects details of lending from each SFCL.	SFCLs are lending on biogas, solar and ICS in energy sector. From 300 SFCLs at least 211 are financing bio gas. They had biogas loan component and a defined procedure for lending on biogas and that is continued by SKBBL too. SKBBL has a plan to pilot test to provide 150 biogas plants by the end of 2013 and targeted to make 750-900 biogas plants within 3 years. Main focus of the pilot test will be 49 districts of mid hill, low hill and terai.
CEDB	Model 1: Bio gas loan to the Companies: to manufacture bio-gas plants and based on their collateral. Model 2: Bio-gas loan to the individual users through the Companies: the company collects loan demands; and monitors and collects installments from individuals. The bio-gas plants are taken as collateral. The individual borrower repays the loan installments to the company and the company pays to CEB. CEB monitors the documents to check whether the loan is actually provided to the real borrower, repayments etc.	CEDB has increasing trend of lending in biogas plants with more focus in the hill area by amount of loan disbursed. CEDB provides loan for 3 years at 14% interest and additional 1% service fee and 3% penalty. Though the proportion of lending to the total portfolio is less than one percent, there is full repayment. Besides these figure, CEDB has disbursed Biogas Loan worth NPR 1,700 thousand to Pragati Gobar Gas Sewa Kendra for the construction of biogas plant. They have been involved in the construction of biogas plant from the fund of NPR 1,700 thousand of CEDB. Thus, CEDB is expecting additional 70 biogas plants to be added within 1-2 months. The table above details out on CEDB investment on Biogas by April 2013.
RMDC	Modality 1 – Group model: Mainly in Grameen model (majority) by MFDBs, FINGOs, cooperatives and Muktinath Development Bank. Other different types of groups like that developed by Heifer, Women Development Office, small farmer cooperatives etc. are provided collateral free loan in group guarantee. There are more than 12 lakh members in this various group model. Modality 2: Microenterprise loan. In this modality both group as well as individuals is provided loans. This loan is specifically targeted to the graduated clients for enterprises.	RMDC has special provision for hill and mountain. RMDC provides soft loan (2% interest) amounting up to Rs. 10 Lakh per branch for MFIs operating in 19 districts that are prioritized by the government. RMDC also supports training to small MFIs in rural areas, covers training costs of the institutions, etc. But there is no special provision for biogas.

BOK	Lend to biogas users in partnership with rural and local microfinance institutions or cooperatives. The local institutions are assigned to monitor the loan and get incentives in return.	Bank of Kathmandu used to provide deprived sector loan at 12-13% up to previous year. And there was demand too for this product. But now it is around 8-9%. As the current deposit rate is around 10%, they are reluctant for this product, which is not yielding even to the level of meeting cost of the fund. Proportion of biogas loan is very low compared to the total portfolio of almost all financial institutions. BOK had invested less than one percent of its total portfolio in bio gas which has even gone down to all most zero level.
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Level of awareness among the users on the price, terms and conditions of biogas loan is reflected in to practices in timely repayment of installment. One third of the users of biogas loan found missing timely repayment of the installments. Regarding questionnaire on the interest rate they pay for biogas loan, 37% don't know the actual rate.

The support organizations are not interested to continue subsidy and about to phase out their support programs in case of biogas as it is expanded in a scale. Secondly, they prefer commercial funding in this sector and don't promote subsidy as it has distorted the credit market.

Biogas loan products should be tied up with income generation activities so as to use the saved time and ensure timely repayment of loan. For this, partnership should be made with organizations supporting livestock and other income generation activities.

Microfinance institutions (MFIs) including the microfinance development banks, financial intermediary non-government organizations and cooperatives are regarded as vehicles for changes in socio-economic status of rural and underserved communities as they reach there. Biogas credit should be implemented through strong MFIs, CBO network and vender and constructed in bulk at cluster levels to reduce cost of operation.

Quality in services provided by the implementations, they suggest for third party evaluation. User's contribution is another important factor in biogas plant installation and credit management. Similarly, capacity development of MFIs and fostering partnership, addressing issues like after-sale service are important.

The users are benefitting from the loan mainly in cleanliness, easily handled even by children, reduced expenses on cleaning clothes, environment improved, health improvement, more effective fertilizer, time saving, economy in cooking fuel, cheaper credit availability, income increased by supporting business, solved firewood availability problem and constructed toilet. So, the users with biogas are feeling happier and social prestige improved.

The individual users of biogas are not well aware and satisfied on the subsidy amount and the cost of equipments and services they received. Many of the users have installed biogas because of

subsidy. Some of the users were found installed biogas plants as they heard that the loan taken from the MFIs are subsidized to the disadvantaged groups including Dalit, Janajati and victims of political violence. Thus they are reluctant to repay the loan. This has questioned on transparency of the subsidy and its delivery channel.

High operational cost and scattered settlement has made problem in extending outreach, grouping, economic activities and hence low IGAs. etc. in microfinance operation the hill and mountain including biogas service delivery.

The biogas companies have problems when the client ask for maintenance after three years, low demand, refunding subsidy amount from AEPC (7 months), high cost of marketing, high costs of retaining staffs, seasonality of work, competition among the companies, managing working capital, and users mis-understanding on the subsidy and cost of materials supplied. They prefer subsidy management by other institutions such as MFI such that they are involved only in technical works and they are paid by the users immediately after completion of the works.

The sampled MFIs found serving 213 - 64,707 members. They have operated starting from one to 383 VDCs and up to 10 municipalities. They are mostly focused in the rural and semi urban areas. Their services have covered 31 districts with 17 districts in the hill in different development regions. They have total outstanding portfolio ranging from Rs.6,00,000 to Rs.1,06,63,26,900 in overall and Rs.24,726 to Rs.1,84,55,506 in biogas.

Financial performances of the MFIs need to be monitored before assigning them task in biogas promotion. Normally they have problems in governance, MIS and diversification of products and services to meet client needs.

The MFIs have revealed their problems in biogas financing mainly in due to services of the biogas company, repayment, managing different interest rates, right targeting, managing fund for supportive business, delay in receiving reimbursement from AEPC, inadequate support from AEPC, higher costs of operation for the hill area, public announcement on free loan and subsidy to disadvantaged groups and monitoring loan in scattered settlements. AEPC process of lending MFIs for biogas is lengthy. AEPC requires 17 types of documents for this purpose. The MFIs have expenses and time consumed in receiving these documents. Almost half of the documents are on receiving references and they are especially problematic for the MFIs. This shows the documents need to be reviewed on whether they are essential or not.

The MFIs don't have specific practices in need assessment nor significant cases of rejecting loan applications. Generally they provide loan as demanded by the users in their contact. Most of the MFIs (53%) are found dependent on biogas companies regarding biogas loan demand collection from the users. Only 42% of the MFIs revealed some plans for biogas promotion in future. The MFIs planning for biogas promotion are mostly interested to continue partnership with AEPC mainly because of subsidized loan.

The MFIs generally don't monitor biogas loan except in cases of delays in installment repayments. Normally the MFIs monitor biogas plants twice - at the preparation phase and after completion, as it is mandatory to prepare completion report for AEPC.

The MFIs found motivated on biogas loan transactions due to various reasons. The principle reasons to be interested in biogas lending are subsidized interest rate, client benefits, increase in membership, enhanced linkage, goodwill and social responsibility.

Table 10: Summary Features of Sampled Local Financial Institutions in Biogas Financing

Overall portfolio at risk of MFIs	30% (Within 26 samples)
Average loan disbursed per biogas plant excluding MFDB	Rs. 34,293
MFIs investing their internal fund in biogas	42%
MFIs active in loan demand collection	34%
MFIs prioritizing loan application for biogas lending	50%
MFIs having ageing practices	27%
MFIs confident on use of biogas loan fund for same purpose	80%
Average interest rate for biogas loan	14% (12-18%)
MFIs having some plans for biogas promotion	42%
Users discontinuing the relation with MFI after repaying biogas loan	23.3% (out of 60 users)
Annual household savings due to biogas use by majority (23%) users	30,000-40,000 Rupees
Users involved in self laboring while constructing biogas plant	92% (out of 60 users)
Users attaching toilet	45% (out of 60 users)
Contribution of loan fund in total cost of biogas construction	78.7%
Contribution of Remittance fund in total cost of biogas construction	1.7%
Users not informed on the terms of biogas loan	30% (out of 60 users)
Users not informed on interest rate of biogas loan	37% (out of 60 users)
Users paying fee to the MFIs to receive biogas loan (Maximum 200 rupees)	28% (out of 60 users)
Major sources of fund to repay biogas loan	Farm income 36.7%, livestock 28.3%, job 23.3%, foreign employment 12%, wage employment 12%, business 8%, loan from other source 5% (out of 60 users)
Users preferences on biogas loan features	Term 2-3 year, quarterly installment, per installment value Rs.2,000 - Rs.3,000, repay loan at MFI offices
Major problems of the biogas users	Stove don't work properly, blockage in gas pipe, no sufficient length of pipe, problem in switch, gas leakages, insufficient gas formation, toilet jams and ineffective maintenance services

5. Recommendations

Based on the study findings, this study recommends the following for improving biogas credit:

1. Role of AEPC should be regulatory and supportive in implementation of biogas promotion programs by the non-government and private sector. AEPC should promote biogas through wholesale/ commercial financial institution in the areas of their interest and directly provide subsidy and/or subsidized loan fund for the areas where the commercial institutions are not interested. In both cases, AEPC should monitor, support and regulate overall implementation and be ensured to meet the target set for biogas promotion all over the country. AEPC should monitor the quality of services provided by the financial institutions as well as the biogas companies.
2. Biogas financing should be developed as a business model to attract other wholesale lending institutions, commercial banks, internal fund of MFIs and users own investment. As the data shows that larger financial institutions are de-motivated to lend on biogas and the commercial wholesale/retail financial institutions express their interest to participate in biogas financing, they should be motivated to invest in this sector. For the areas wholesale/ commercial financial institutions are interested, AEPC should lend to the MFIs directly or through the wholesalers. In order to involve the wholesalers in biogas financing, AEPC should provide fund to the wholesale/ commercial financial institutions at some special (marginal) discounted rate so that they can lend the retail MFIs at the similar rate as the MFIs receive directly from AEPC. This kind of special incentive to the wholesaler/commercial banks can be provided by AEPC in case of using their own fund too (eg, provide 1% interest as complement) upon negotiation and joint agreement on biogas financing plan by both parties. Such special incentives should be provided upon the evidence of biogas financing by the wholesale/ commercial financial institutions. The wholesalers will be motivated to participate in biogas financing with the discounted rate while AEPC benefits by saving the loan monitoring cost as it will be easier than that for MFIs while meeting the target to expand biogas plants.
3. In both of the modality, direct funding to the MFIs or through wholesale/ commercial institutions, a commercial rate of interest should be charged to the MFIs and provide them Administrative Grant upon timely repayments. Such grant should be used for client education and capacity building of the MFI staffs so as to improve the quality of biogas loan. This will motivate the MFIs in monitoring biogas loan. This practice will also change their practices on loan monitoring that ultimately supports in their portfolio quality and hence institutional sustainability.
4. The MFIs should be encouraged/conditioned to mobilize their internal fund as per their capacity and lend at market rate, together with external fund, to the biogas users. Similarly, the users should be encouraged/ conditioned to mobilize their own fund and borrow from the MFIs as per their need.
5. In the context the donor and financial institutions are in favor of reducing subsidy, AEPC should adopt strategies to minimize subsidy. For this, AEPC subsidy should be allocated to the needy people only. Subsidy needs can be identified by targeting by geographical area and/or poverty status. So, AEPC should provide subsidy and/or subsidized loan only for the areas where commercial fund are not available or for the poor households in the accessible

areas. So, at the first intervention towards subsidy minimization, the cash subsidy provision should be removed/ minimized for the non-poor households in the areas where commercial fund are accessible. The subsidized interest rate together with awareness on costs and benefits of biogas will motivate the MFIs and non-poor households to install biogas as it supports their willingness while they already possess ability to afford for biogas.

6. In the context financial institutions have limited practices to measure client poverty status using standard tool, required data may not be available in every financial institution. But, gradually they should be facilitated to use standard tools for household level poverty measurement such as Progress out of Poverty Index (PPI) or standardized Participatory Wealth Ranking, Food Security Index, or measuring income and comparing to the national per capita income/ poverty line or a standard set by AEPC. If these data of the client are difficult to receive at the time of demand collection at initial practices, this information should be derived through special studies and used to review subsidy policy.
7. Role of MFI and company are equally important. Assign roles of financial management-including subsidy, through MFIs and biogas technical management by companies.
8. Selected MFIs provide loan to the clients based on their need assessment. MFIs estimate the need for biogas in their work area. MFIs provide information on biogas and loan before and after sales through meetings, coaching and printed materials such as brochure. MFIs provide Biogas Loan to the individual as per requirement to construct biogas plant based on loan application verified by MFI and the MFI norms. The borrower has to pay interest and follow terms and conditions as per the biogas loan policy of the MFI. Entire loan amount is transferred/deposited to his/her savings account at the MFI and gets interest as per MFI's savings policy. The biogas loan user can withdraw up to 30% of the approved loan amount in the first installment for preparation, up to 40% after field verification by MFI that the pit and raw materials are ready and; the remaining 30% amount as the final installment only after the completion of biogas structure (inlet, outlet and the dome). For this, the user has to provide the plant completion document with photograph of the structure clearly showing the plant number, company technician and the borrower and; signed by the biogas company and the biogas user to prove the construction is completed and functional. MFI needs to verify the documents by field visit before releasing the final installment. In case the user is qualified to receive subsidy, the subsidy amount will be released as the final installment. This mechanism for credit and subsidy delivery will be included in the client information materials and MFI needs to be ensured that the clients understand them and make informed decision for biogas loan. In the present context of lack of transparency on subsidy among MFIs and biogas users, this provision will make each stakeholder clear on subsidy as well as loan and hence make them more responsible in biogas promotion.
9. Manage for sufficient and well trained human resources for effective management of biogas financing activities. For this, AEPC should increase the number of staff or assign a third party for assessment, data verification, monitoring and evaluation. AEPC should manage to train the staffs mainly on effective monitoring, analyzing the financial performances of the MFIs, documenting the achievements, gap analysis, data management etc. or use a specialized third party having the qualification.
10. The biogas loan application documents from the financial institutions should be revised as follows:

Table 11: Recommendation to review Application Document

Existing Requirements (for New and/or Additional Loan)	Specific Recommendation
Biogas loan application form in AEPC specified format	Continue: this is basic document that provides general information, activities, outreach and summary trend of financial status. <u>Modify</u> : the application should include also a summary outreach by number, gender, ethnicity, geography and client poverty status. These information should match with the progress report.
Attested copy of Institution Registration Certificate – for New only	Continue: it is an important legal document of the institution
Attested copy of renewal of Institution Registration (For NGOs)	Continue: it verifies continuity of the institution’s existence
Attested copy of the Institution’s Bylaw - for New only	Continue: it is important. <u>Add</u> : Savings and Credit Policy; Institutions’ policy on biogas loan; If there is no specific policy or no explanation on biogas promotion in the existing policies, ask to include the institutions’ strategy on biogas promotion in the Loan Application Form or Management Committee Decisions for the first time applicant. Ask for revised policies with biogas promotion strategy once after they are updated. AEPC should provide technical assistance in updating these policies when required.
Attested copy of Management Committee Decision (clear on number of plant and loan amount demanded) to borrow from AEPC	Continue: this is important
Mandatory to submit the attested copies of Audit Report (including the profit and loss, balance sheet, income statement etc.) of the institution for the past three years for new loan and two years for additional loan.	Continue
Mandatory to submit reference letters from Dairy Producers Association for Dairy Producer Cooperatives and from District Forest Office for Forest User Groups	Stop: these references have neither specific assessment of the institution nor have any role in biogas loan monitoring or repayment. If these references are to be continued, they should be assigned/ responsible in biogas loan monitoring or ensuring to support repayment.
Reference letter from Division Cooperative Office (for all cooperatives)	Stop: Division Cooperative Office reference without updated and standard assessment/ monitoring of the cooperative doesn’t have meaning. If the reference is to continue, the office should provide reference only after assessment/ monitoring and it should be assigned/ responsible in biogas loan monitoring or repayment.
Conduct a biogas installation feasibility study in the work area of the institution and attach the study report in Demand Collection File.	Continue: this is necessary mapping document <u>Modify</u> : in addition to biogas technical feasibility, include the total number of household in the work area, number of households with biogas, potential number of households to use biogas at present, similar projection at least for the next two

	years, major purpose for biogas installation, type of existing fuel for cooking/lighting, annual household fuel expenses on cooking/lighting, proportion of fuel expenses to total household expenses etc. In addition, the survey should disaggregate the loan demand by gender, ethnicity, geography and client poverty status.
Mandatory to attach reference letter in the format provided by AEPC to the DEEU/S	Stop: DEEU/S reference without updated and standard assessment/ monitoring of the institution doesn't have meaning. If the reference is to continue, the office should provide reference only after assessment/ monitoring and it should be assigned/ responsible in biogas loan monitoring or ensuring to support repayment.
Mandatory to attach reference letter in the format provided by AEPC to the NBPA Regional Office	Stop: NBPA Regional Office reference without updated and standard assessment/ monitoring of the institution doesn't have meaning. If the reference is to continue, the office should provide reference only after assessment/ monitoring and it should be assigned/ responsible in biogas loan monitoring or ensuring to support repayment.
Reference letter from the Regional Service Centers (RSCs)	Stop: RSCs reference without updated and standard assessment/ monitoring of the institution doesn't have meaning. If the reference is to continue, the office should provide reference only after assessment/ monitoring and it should be assigned/ responsible in biogas loan monitoring or ensuring to support repayment. Service centers' services should be commercialized so that they are motivated to provide services based on their income from the services.
In case the applicant institution has borrowed from other institutions, it is mandatory to submit the reference letter from lending institution with explanation on status of loan.	Modify: It is costly to receive the reference letter from each of the lending institutions with updated loan status. So, this can be replaced by <u>self-declaration of the BOD</u> on the outstanding borrowings and other external liabilities. This document may contain their consent and clauses to treat it legally in case of any false found in this declaration. Regular monitoring or special evaluations by AEPC or third party assigned can check this situation in sample.
Reference letter from the Central/ District level Cooperative Union is mandatory for the subjective cooperatives applying for biogas loan	Stop: Cooperative Union's reference without updated and standard assessment/ monitoring of the institution doesn't have meaning. If the reference is to continue, the union should provide reference only after assessment/ monitoring and it should be assigned/ responsible in biogas loan monitoring or ensuring to support repayment.
Attested copies of PAN Certificate and Tax Clearance Certificate for the last fiscal year	Continue: it is important to be registered and renewed in tax
Attested copies of citizenship certificate of the Directors	Continue: It may not be required for the additional loan if the BOD is the same. But, the financial institutions have to update the BOD information at every change during the loan period.
Collective self-declaration from the directors on not being Black Listed by Nepal Rastra Bank or the government	Continue: it is important. This should be regularly monitored/ verified by AEPC and take action if the declaration found false.

11. AEPC should assess the performance of the MFIs before deciding for loan. The assessment should focus mainly on strategic/business plan, outreach, governance, account, financial performance and linkages. It would be cost effective to partner with institutions (financial and biogas company) that have good management, governance, financial performance, coverage and clear vision in promoting biogas. Such institutions can implement the project successfully in bulk and get economies of scale and require minimal monitoring.
12. From the progress/outreach report, audit report AEPC should analyze outreach and financial performance trend at least for the past three years. The financial performance analysis should include trends of interest income and other income; interest expenses, operating expenses, loan loss provisioning and other expenses; profit/ loss; liquidity; outstanding loan; fixed assets; investment; total assets; savings; borrowings; other liabilities; share; general reserve; other reserves; capital grants; operational self-sufficiency; financial self-sufficiency; Return on Assets; Returns on Equity; Portfolio Yield; solvency; efficiency and profitability ratios.
13. The MFI should apply for biogas loan at least with an estimated number of plants and required loan amount for a period of three years. Once the agreement is made, AEPC has to provide the amount to the MFI according to the projection. This agreement may consider 10% variation in the agreed number of plants and actual achievement. This will support for realistic target and ensure both the AEPC and MFIs in achieving their plan as per agreement.
14. AEPC have to provide training to the selected MFIs on biogas, biogas loan, subsidy management, social mapping and poverty measurement, loan monitoring, good governance, financial management, accounting and business plan as per their need identified in the assessment.
15. The MFIs have to provide awareness training to the users on biogas, biogas loan and subsidy provision. The biogas users should know the basic technicalities of biogas such as installation, operation and maintenance. The biogas companies/technicians and informative tools can be used to provide this information. Similarly, the biogas loan takers should know the objective of biogas loan, cost savings on fuel consumption, interest rate, terms, installments, fee, penalty etc. related to biogas loan. The users of biogas loan should be well informed on the amount, process and intent of subsidy for biogas. Each of this information should be provided to the users before they sign the loan document. Awareness and information dissemination should be continued with refreshers, coaching or simply discussion at meetings as needed.
16. Monitoring practice should be scientific and sufficient (increase frequency at least twice a year). Apply appreciative monitoring practices to motivate the MFIs and users on biogas lending. AEPC role should be like a doctor – who diagnoses the problem of the patient and suggest for recovery rather than a police – who dictates problems. The monitoring should be based on a technical check list that shows the financial and overall strengths and gaps of MFIs, biogas loan transaction and user level feedbacks. This checklist/monitoring tool will guide the staff in monitoring works and provides notable feedbacks in a structure. Each monitoring should include client visit and plant visit in random sample to cover at least statistically significant number of plants each year.
17. The monitoring tool should be effective and efficient to include different information together such as number and amount of biogas loan by geographical area and users profile, number of users trained on different aspects of biogas/biogas loan; number of events

organized for client education; client satisfaction/problems as per monitoring visit report; biogas loan repayment status including the financial performance, outreach and portfolio information on overall transactions of MFI. Similarly, user level monitoring should include the feedbacks on functioning of plants, management and use of fund and resources, repayment of loan, problems in loan repayment, perception on services of biogas company/MFI, use of other products and services of MFI; interest to affiliate to the MFI, suggestions to improve biogas etc.

18. Develop mechanisms for effective construction and after sales services to ensure smooth functioning of the plants. Continue support and partnership with biogas companies in improving quality of materials and services. Make them specialized in hardware technical services for biogas plants and effective maintenance service delivery. In order to manage for effective maintenance service, field staffs of MFIs can be trained for minor maintenance works as they are in close and regular contact with the users. Major maintenance should be done by the biogas companies/local technicians and they should be paid by the users. MFIs should be responsible to relay the major problems to the biogas company/technicians and the companies/technicians should provide timely services to the users. Make the vendors accountable to the clients and MFIs with commitment for long term support services. A type of commitment should be included in partnership document between AEPC and the MFIs or the biogas companies.
19. Provide income generating activities to support repayment of biogas loan. For this, the MFIs should target the clients who are interested/ involved in activities that are related both to biogas and income generation such as livestock and farming. In such a case, the MFIs have to design loan products that scale up the client's existing business or support them to establish new business. In addition to this, MFIs can provide biogas loan together with additional loan for other income generating activities as per client interest.
20. AEPC should use own effective / third party services in appraisal, training, monitoring and evaluation to support effective implementation of biogas financing. Such activities suggest for improvements and capacity building for effective financing mechanisms.
21. Promote innovative technologies for higher efficiency in operation of biogas plants. Prioritize cluster based and bulk investments in partnership with well established financial institutions and biogas companies that ultimately reduces cost. So, the partners – company and MFI, should be selected based on technical capacity and outreach.
22. Apply social/public audit of biogas in construction and financing to improve transparency. Such audits are to be organized by the MFIs in presence of the company, users, local community and also AEPC/wholesaler where possible. The quality and price of the materials; cost of services; loan price terms and conditions; subsidy amount and process etc. to install biogas plants should be made transparent through such programs, meetings or information boards/materials.

6. Annexes:

Annex 1: Resource Person Contributing for the Study

S.N	Name	Institution	Designation
1.	Mr. Dinesh Dulal	Clean Energy Development Bank Ltd.	Relationship Manager, Renewable Energy and Microfinance Department
2.	Mr. Bhola Nath Regmi	Rural Microfinance Development Center	Senior Officer
3.	Mr. Dipen Man Singh Pradhan	Bank of Kathmandu Ltd.	In charge, Development Credit Unit
4.	Mr. Shankar Raj Pandey	KFW Development Bank	Head of KFW Office, Nepal
5.	Carsten Glenting	World Bank	
6.	Mr. Jhalendra Bhattarai	Sana Kisan Bikas Bank Ltd.	Senior Manager
7.	Mr. Ashis Shrestha	South Asia Sustainable Development, World Bank	Operation Analyst
8.	Mr. Saroj Rai	SNV	Senior Renewable Energy Advisor
9.	Mr. Samir Thapa	Alternative Energy Promotion Center	Assistant Director
10.	Mr. Manu Binod Aryal	Alternative Energy Promotion Center	Credit Officer
11.	Mr. Dharma Dulal	Alternative Energy Promotion Center	Credit Assistant
12.	Mr. Raju Ghimire	Alternative Energy Promotion Center	Account Assistant
13.	Mr. Amar Nath	District Development Committee/ EEO, Sunsari	EEO
14.	Mr. Mahendra Acharya	Mechi Biogas Company	General Manager
15.	Mr. Yuba Raj Dahal	Suryodaya Biogas Company	Director
16.	Mr. Yam Nath Dahal	United Biogas Company	

Annex 2: Check list for Biogas Expert Level Interviews

Centre for Microfinance Nepal/ Alternative Energy Promotion Centre
Study on Impact of Credit on the Installation of Biogas Plant
Checklist for meeting with Experts on biogas financing

Study Objectives: The major objective of this study is to assess different financial modalities of credit flow in biogas installations and also to suggest possible ways to increase the credit access to the hills and mountains for the installation of biogas plants. The activities include:

- Assess the different financial modalities of credit flow in installation of biogas plants
- Assess the lending policies and strategies of Financial Institutions for financing RETs in general and biogas in particular.
- Conduct a survey in order to find out the current status (number of plants, size of loan, number of loan, location, default rate, etc.) of banks and financial institutions' lending in the biogas sector
- Find out if remittance is also being used for the construction of biogas plants
- Assess the different sources of utilization of user's contribution for the installation of biogas plants

Name of Respondent:

Date:

Affiliation/Institution:

Designation:

Contact:

1. What is the major role of your institution in biogas promotion/financing in Nepal?
2. A summary data of your investment and achievement in biogas sector in Nepal
3. What are the biogas financing modalities in your observation? Nepal and other countries if any.
4. What are the strengths and gaps of the biogas promotion/ financing modalities?
5. What are the major impacts of biogas credit to the users and other stakeholders?
6. What about need and effectiveness of subsidy for biogas?
7. What are the most appropriate ways/ strategies to increase credit access in rural/ remote and hill/mountain for biogas plants installation?

Annex 3: Checklist for meeting with Financial Institutions

Centre for Microfinance Nepal/ Alternative Energy Promotion Centre
Study on Impact of Credit on the Installation of Biogas Plant
Checklist for meeting with Financial Institutions

Study Objectives:

Name of FI:

Respondent:

Designation:

8. What is your financial modality for bio-gas loan? (Explain on actors/process)
9. What are your lending policies and strategies for RETs, specifically Bio-gas?
10. Provide any other supports eg; capacity building, ... to MFIs/ Clients?
11. Data on Bio-gas loan (3 year)

SN	Details	Current	FY 2068/69	FY 2067/68
23.	No. of Plants			
24.	No. of loan			
25.	Amount disbursed			
a.	Hill			
b.	Terai			
c.	EDR			
d.	MDR			
e.	WDR			
f.	MWDR			
g.	FWDR			
26.	Loan Size (Range, average)			
27.	Outstanding loan amount			
28.	% of your total portfolio on Bio-gas			
29.	Repayment Rate			
30.	Default Rate			
31.	Term			
32.	Interest Rate			
33.	Fee and other costs charged			
34.	Penalty provision			
35.	Repayment method			
36.	Beneficiary HHs			

12. Ratio of MFIs in Bio-gas financing (% out of total amount disbursed for bio-gas) (MFDB%, Cooperatives%, NGOs%,%,%)
13. Does quality of loan varies by type of MFIs?
14. Have you received any subsidies for bio-gas financing? Explain
15. What are the attractions/benefits/ motivation factors of bio-gas financing for you?
16. Explain your plan to increase bio-gas loan (area, partner, number of plant, amount, period, recovery)
17. What are the obstacles/ problems of bio-gas loan for you?
18. How are you handling non-performing loan for bio-gas?

19. What are the problems of bio-gas loan for MFIs you know in course of partnership?
20. What are the special challenges for increasing the access of credit for installing bio gas plants in hills and mountains?
21. How could it be overcome?
22. Do you have any information on the uses of loan?
23. Do you have information on the contribution of bio gas plant installers from their resources such as money received from remittances?
24. What is the total penetration of bio-gas loan you estimate? (Averageplants at rate Rs.)
25. Do you seek new partnership or review existing partnership for bio-gas financing? Explain
26. Do you have any more suggestions to make this study effective?
27. Do you have any questions for us?

Annex 4: AEPC Biogas Financing Partners by development Region

S.N	EDR		MDR		WDR		MWDR		FWDR	
	District	Partner	District	Partner	District	Partner	District	Partner	District	Partner
1.	Dhankuta	1	Bara	2	Argha khachi	1	Banke	11	Doti	1
2.	Ilam	12	Bhaktapur	1	Gorkha	4	Bardia	13	Kailali	5
3.	Jhapa	26	Chitwan	25	Kapilvastu	6	Dailekh	1	Kanchanpur	9
4.	Khotang	1	Dhading	1	Nawal parasi	16	Dang	5		
5.	Morang	36	Dhanusa	3	Palpa	1	Pyuthan	1		
6.	Panchthar	6	Dolakha	4	Rupandehi	7	Rukum	1		
7.	Sankhuwasabha	1	Kathmandu	6	Tanahun	4	Surkhet	11		
8.	Saptari	1	Kavre	18						
9.	Sarlahi	2	Lalitpur	2						
10.	Sindhuli	2	Mahottari	1						
11.	Siraha	3	Makwanpur	4						
12.	Sunsari	13	Nuwakot	1						
13.	Taplejung	1	Ramechhap	1						
14.	Tehrathum	3	Rautahat	4						
15.	Udayapur	3	Sindhupalchok	3						
Total = 284		111		76		39		43		15

Annex 5: Financial institutions selected for field study

SN	District	Name of Financial Institution
1.	Banke	Mahila Samaj Sewa Saving and Credit Cooperative
2.	Bara	United Development Bank Limited
3.	Bardiya	Bishwashilo Saving and Credit Cooperative
4.	Chitwan	Shree Kamal Pokhari Garibi Nibaran Sana Kishan Krishi Cooperative
5.	Dang	Social Up Grade in Progress of Educational Region (SUPER)
6.	Dhankuta	Solve Nepal
7.	Gorkha	Gorkha Gharelu Tatha Sana Udhog Bikash Saving and Credit Cooperative
8.	Jhapa	Mechi Cooperative
9.	Jhapa	Ganesh Multipurpose Cooperative
10.	Jhapa	Sahara Nepal
11.	Jhapa	Karnali Saving and Credit Cooperative
12.	Kailali	Grameen Sewa Nepal
13.	Kanchanpur	Jana Sewa Saving and Credit Cooperative
14.	Kapilbastu	Siddhartha Saving and Credit parichalan Cooperative
15.	Morang	Lali Gurans Saving and Credit Cooperative
16.	Morang	Shree Deepjyoti Nari Bikash Saving and Credit Cooperative
17.	Morang	Ramailo Saving and Credit Cooperative
18.	Morang	Samaj Kalyan Saving and Credit Cooperative
19.	Morang	Naulo Bihani Krishi Bikash Sahakari Sanstha Limited
20.	Rupandehi	Paschimanchal Grameen Bikash Bank
21.	Sarlahi	Grameen Soyemsewak Samaj
22.	Sarlahi	Chameli Saving and Credit Cooperative
23.	Sunsari	Shree Dugdha Utpadak Sahakari Sanstha Limited
24.	Sunsari	Manakamana Saving and Credit Cooperative
25.	Surkhet	Shree Gaun Shahar Multipurpose Cooperative
26.	Tehrathum	Miteri Multipurpose Cooperative

Annex 6: Questionnaire for local financial institutions

Centre for Microfinance Nepal/ Alternative Energy Promotion Centre
Study on Impact of Credit on the Installation of Biogas Plant
Checklist for meeting with Microfinance Institutions

***Study Objectives:** In our context with farming as major occupation and increasing energy shortages, Biogas is regarded as very useful renewable energy technology that provides us clean and cheap energy for daily use. Access to finance is one of the major factors determining use of this technology. This study aims to assess different financing modalities and find effective financing options for bio-gas - more specifically in the hill and mountain areas. We are here as you are one of the notable stakeholders in bio-gas promotion in Nepal.*

The information you provide will be confidential and will be used only for the study purpose. In general, your name will not be tied up with your confidential information without your prior consent.

Date:

1. Introduction

1.1. Name of MFI/ Cooperative:

Contact No:

1.2. District:

1.3. (Tick✓), VDC/Municipality Name.....

Ward no:

1.4. Date established:

1.5. Name of respondent:

Contact No:

1.6. Designation:

2. General information of MFI

	FY 2069/70	FY 2068/69	FY 2067/68
2.1. Name of Districts covered			
2.2. Number of VDCs/Municipality			
2.3. Number of staff			
2.4. Number of clients/ members			
2.5. Number of households in work area			
2.6. Types of savings product			
2.7. Number of savings account			
2.8. Total savings amount			
2.9. Types of loan product			
2.10. Lending methods in practice (1.group, 2.individual, 3.individual with group guarantee, 4.Project collateral, 5.Project Cash Flow, 6.Physical Collateral, 7. Other.....)			
2.11. Number of borrowers			
2.12. Number of outstanding loan			
2.13. Total loan disbursed			
2.14. Amount of loan recovered			
2.15. Total outstanding portfolio			
2.16. Number of delinquent loan			
2.17. Amount of delinquent loan			
2.18. Remittance service type : (1.International, 2.Domestic,			

3.Other....)			
2.19. Type of Insurance products (1. Life 2. Livestock 3. Crop 4. Other)			
2.20. Total assets			
2.21. Total share capital			
2.22. Capital grant			
2.23. Total reserves			
2.24. Outstanding borrowings			
2.25. Total Liability			

3. Do you have specific lending policies on RETs (Rural/renewable Energy Technology), specifically Bio-gas? If yes, explain lending policies and strategies for RETs, specifically Bio-gas?

4. What are the lending modalities for biogas you have in practice now or in the past?

Modality	Present (explain sources)	Past (explain sources)	Why you changed modality?
4.1. Get <u>commercial</u> wholesale loan and lend to the users of bio-gas			
4.2. Get <u>subsidized</u> wholesale loan and lend to the users of bio-gas			
4.3. Get wholesale loan in the name of individual user, <u>monitor</u> the loan and pay back			
4.4. Get wholesale loan for general purpose and lend also on bio-gas			
4.5. If other (explain).....			

5. Fund Sources (related to the loan you receive for bio-gas)

Name /Sources	Source 1:	Source 2:	Source 3:
5.1. Borrowing Rs. (before 2069 Asar)/ No. of year			
5.2. Borrowing Rs. (2069/70)			
5.3. Number of plants (cumulative)			
5.4. Rate of interest paid (%)			
5.5. Interest amount paid (2069/70)			
5.6. Interest rate method (1.Flat, 2.Declining Balance)			
5.7. Loan term (duration in months)			
5.8. Fund receiving method (1.purposes individual users name before borrowing, 2.take loan in MFI name and then lend to users, 3.Other.....)			
5.9. Repayment method (1.Whatever is collected from the users, 2.Fixed installment, 3.flexible installment, 4. Lumpsum at any time, 5.other.....)			

5.10. Repayment schedule (1.Whenever it is collected from the users, 2.Monthly, 3.Quarterly, 4.half yearly, 5.yearly, 6. flexible, 99.Other.....)			
5.11. Outstanding borrowing (current)			
5.13. How the lender monitors loan to your institution (1. Submitted document review 2. Visit MFI 3. Visit biogas users 99. Other			
5.14. Overdue amount			
5.15 Portfolio at Risk (PAR>30 day)			
5.16. Fees you pay (2069/70)			
5.17. Fine you paid (2069/70)			
5.18. Subsidy (if any others than subsidized interest rate)			
5.19. Your other liabilities/ responsibility			
5.19. Other supports/ incentives you received from borrower			

6. Data on Bio-gas loan (3 year)

SN	Details	FY 2069/70	FY 2068/69	FY 2067/68
6.1.	No. of Plants (in total)			
6.2.	No. of households			
6.3.	Loan Term (month)			
6.4.	Interest Rate %			
6.5.	Interest calculation method (1.daily, 2.monthly, 3.annually, 4.other			
6.6.	Interest Rate method (1.Declining balance, 2. Flat, 3.Other			
6.7.	Lending methods (1. group, 2.individual, 3.individual with group guarantee, 4. Biogas as collateral 5. Physical Collateral, 99.Other.....)			
6.8.	Required documents (1.Citizenship, 2. Group recommendation, 3. Loan demand form 4. Co-signer guarantee 5. Feasibility study 6. Collateral 7. Photo 99. Other			
6.9.	Physical collateral (1.Biogas plant, 2.house, 3.land, 4.gold, 5.Fixed Savings, 6.Other)			
6.10.	No. of loan demanded			
6.11.	No. of loan disbursed (total)			
6.11.a.	Mountain			
6.11.b.	Hill			
6.11.c.	Terai			
6.11.d.	Rural			
6.11.e.	Urban/ Semi-urban			
6.12.	Amount disbursed (total)			
6.12.a.	Mountain			
6.12.b.	Hill			

6.12.c.	Terai			
6.12.d.	Rural			
6.12.e.	Urban/ Semi- urban			
6.13.	Total internal fund of MFI used			
6.14.	Loan Size (practice)			
6.14.a.	Minimum			
6.14.b.	Maximum			
6.15.	Number of outstanding loan			
6.16.	Outstanding loan amount			
6.17.	Amount of loan recovered			
6.18.	Number of overdue loan			
6.19.	Amount of overdue loan			
6.20.	Number of overdue loan more than one year			
6.21.	Amount of overdue loan more than one year			
6.22.	Portfolio at Risk (> 90 days)			
6.23.	Number of write off loan (cumulative)			
6.24.	Amount of write off loan (cumulative)			
6.25.	Fee and other costs charged to user			
6.26.	Penalty method			
6.27.	Repayment method (1.Equal installment, 2.flexible installment, 3.interest (regular) and Principal (flexible), 4.principal and interest in lumpsum, 5.Other.....)			
6.28.	Repayment frequency (1.monthly, 2.bi-monthly, 3.quarterly, 4. Annual, 5.lumpsum, 6.Other.....)			

7. What are the differences in delivering services (biogas) to mountain, hill and terai in practice?

Indicators	Mountain	Hill	Terai	Remarks (Explain if it differs by fund source)
7.1. Loan processing period (Day)				
7.2. Interest rate (%)				
7.3. Repayment frequency (1. Monthly 2. Quarterly 3. Bi-annual 4. Annual 5. Lumpsum 99. Other)				
7.6. Loan Term (month)				
7.7. Estimated cost for lending / plant				
7.8. Fee & other costs charged				
7.9. Penalty provision				
7.10. Repayment method (1.Equal installment, 2.flexible installment, 3.interest (regular) and Principal (flexible), 4.principal and interest in lumpsum, 5.Other.....)				
7.11. Source of fund (special focus)				
7.12. Annual demand for bio-gas (no. of plant)				
7.13. Total estimated users of bio-gas loan in work area				
7.14. Biogas users using MFI loan				

(estimated)				
7.15. Average amount of bio-gas loan				
7.16. Estimated % of bio-gas loan demand fulfilled				
7.17. Explain if any others				

8. How do you identify bio-gas need for users?
9. How do you collect users demand?
10. Do you motivate the users to use bio-gas? (yes/no)
11. If yes, how?
12. Do you prioritize clients for biogas loan? (yes/no)
13. If yes, on what basis? (1. Amount demanded 2. Application date 3. Need 4. Personal characteristics 5. Past loan performance, 6. Poverty, 7. Feasibility study 99. Other ...)
14. What are the subsidies provided to the users?
15. Do you have aging practices of bio-gas loan?
16. In general, what % of the borrower used biogas loan for the same purpose?
17. How do you monitor uses of bio-gas loan?
18. What are the attractions/benefits/ motivation factors of bio-gas financing for your institution?
19. Explain your plan to increase bio-gas loan (1. area, 2. partner, 3. number of plant, 4. amount disburse, 5. period, 6.recovery, 7.other.....)
20. What are the obstacles/ problems of bio-gas loan for you?
21. How are you handling non-performing loan for bio-gas?
22. What are the benefits of biogas to the users?
23. What are the problems of bio-gas loan for the users you know?
24. How is maintenance of bio-gas plant managed (who,)
25. What are the capacity building services you provide to the bio-gas users
26. What do you suggest to improve repayment of biogas loan?
27. What are the special challenges for increasing the access of credit for installing bio gas plants in hills and mountains?
Hill:
Mountain:
28. How could it be overcome?
Hill:
Mountain:
29. Do you seek new partnership or review existing partnership for bio-gas financing? (yes/no)
If yes, which and what type of organization/institution?
30. What are the appropriate/ alternative financing methods for bio-gas promotion?
31. What are the positive and negative sides of subsidy on bio-gas?
Positive:
Negative:
32. What do you suggest on subsidy management (needs, amount, and process) in bio-gas?
Need:
Amount:
Process:
Other:

Thank you for your valuable responses

Annex 7: Questionnaire for Biogas Users

Centre for Microfinance Nepal/ Alternative Energy Promotion Centre
Study on Impact of Credit on the Installation of Biogas Plant
Questionnaire for Interview with Biogas Users

***Study Objectives:** In our context with farming as major occupation and increasing energy shortages, Biogas is regarded as very useful renewable energy technology that provides us clean and cheap energy for daily use. Access to finance is one of the major factors determining use of this technology. This study aims to assess different financing modalities and find effective financing options for bio-gas - more specifically in the hill and mountain areas. We are here as you are one of the notable stakeholders in bio-gas promotion in Nepal. The information you provide will be confidential and will be used only for the study purpose. In general, your name will not be tied up with your confidential information without your prior consent.*

Date:

1. General Information

- 1.1. Name : Contact Phone:
- 1.2. Address: 1.2. District 1.3.(Tick✓) VDC/ Municipality 1.4. Name of VDC/Municipality..... 1.5. Ward No 1.6.Tole:
- 1.7. Name of Microfinance Institution:
- 1.8. Years of affiliation:
- 1.9. Types financial products used:
- 1) Savings 2) Loan 3) Micro-insurance 4) Remittance 5) Other
-

2. General Household Profile:

- 2.1. Family Size:
- 2.2. No. of family members generally live together/ eat in the same kitchen in the same (this) house:
- 2.3. No. of family members generally live out:
- 2.4. Where is the place they live:
- 2.5. Number of migrants (foreign) among family members:
- 2.6. Major household occupation:
- 2.7. No. of regular job holders:
- 2.8. No. of family members involved in some local job: 1) Enterprise:___ 2) Farming as major job:___
- 2.9. Annual Household Expenses (Cash)

Expense Heading	Amount (Rs)	Expense Heading	Amount (Rs)
Food		Cooking fuel	
Cloth		Electricity (light)	
Rent		Transportation	
Education		House maintenance	
Health		Others	
.....		Total	

3. Affiliation to financial institution (at household level)

Type of MFI	No. of family members	Monthly saving	Total saving	Loan taken	Purpose	Outstanding loan
MF Bank						
Cooperative						

FINGO						
..... Bank						
..... group						

4. Biogas Financing (provide breakdown of total amount spent to construct the plant)

S.N	Sources	Amount	Remarks (elaboration of the source)
1	Remittance Income		
2	Own savings		
3	Other income		
4	Loan		
5	Subsidy		
6		
	Total	

5. Biogas loan from MFI:

- 5.1. Is this the first biogas in your house? (yes/no)
- 5.2. If it is not the first, why did you made another?
- 5.3. Who informed you on biogas at the first time?
- 5.4. Why were you interested to use the biogas?
- 5.5. Was MFI loan for biogas really necessary for you? (yes/no)
- 5.6. What is the size of your biogas plant? (----cubic meter)
- 5.7. Is it appropriate for you?(yes/no)
- 5.8. Why did you borrowed from the MFI? Why not other sources?
- 5.9. What were you informed on bio-gas loan by MFI before borrowing (1.interest rate, 2.terms, 3.fees, 4.fine and 5.other..... conditions)
- 5.10. If yes informed, who, how and where? (person, method, place)
- 5.11. What were the actual expenses you paid in cash for biogas installation?
- 5.12. What were the activities your family did (labor, collection of materials etc.) in biogas construction?
- 5.13. What was the process of receiving the biogas loan?
- 5.14. What were the documents required for biogas loan? (1.Citizenship, 2. Group recommendation, 3. Loan demand form 4. Co-signer guarantee 5. Feasibility study 6. Collateral 7. Photo 99. Other)
- 5.15. Did you pay any fee in receiving biogas loan?(yes/no) If yes, how much?
- 5.16. What is the interest rate you are paying for biogas loan?
- 5.17. Is there any physical collateral you give to MFI for biogas loan?(yes/no) If yes, explain
- 5.18. What are your income sources to repay biogas loan?
- 5.19. At what frequency you repay this loan?
- 5.20. How much of this loan amount do you repay at one time?
- 5.21. What is the term/period of this loan?
- 5.22. Have you ever missed (may be just one time) to repay the loan/installment on time? (yes/no)
- 5.23. If yes, what are the major difficulties/reasons?
- 5.24. How much penalty you have to pay in case of late payment?
- 5.25. Do you get any discounts on advanced payment of the loan?(yes/no)
- 5.26. What interest rate method your MFI follows in biogas loan? (1.Declining balance, 2.Flat, 3.Other...)

- 5.27. How your MFI calculates interest rate on your biogas loan (1.Daily, 2.monthly, 3.Annually, 4.Other...)?
- 5.28. What is the installment method you use in biogas loan? (1.equal, 2.flexible, 3.lumpsum, 4.other...)
- 5.29. What is the appropriate installment amount for biogas loan for you?
- 5.30. What is the appropriate term/period for biogas loan for you? (month)
- 5.31. What is the appropriate frequency of installment repayment for you?
- 5.32. What is the appropriate interest rate for biogas in your opinion?
- 5.33. Is there any special time more suitable to repay the biogas loan?
- 5.34. Where is the suitable place to repay the biogas loan (1.office, 2.home collection, 3.other...)?
- 5.35. How do your MFI monitor your biogas loan?
6. Do you have any other problems related to biogas? Explain
7. What are the benefits of biogas for you? (1.time saving, 2. Health, 3.environment, 4.sanitation, 5.other.....)
8. Have you attached toilet with the biogas?(yes/no)
9. Give reasons (why yes, why no?)
10. What would be the cost for fuel if you don't have biogas? (Calculate the cost of firewood, kerosene, gas, etc.)
11. Suggestions
 - 11.1. What are the major obstacles of expanding biogas?
 - 11.2. What could be the best options to solve these problems?
 - 11.3. What could be your contribution to promote biogas in your community?
 - 11.4. What could be the role of the government/ MFI and other stakeholders to promote biogas?

Thank you for your valuable responses

Annex 8: Number of Biogas Plants by District

S.N	Districts	Total Plant	zone	S.N.	Districts	Total Plant	Zone	
1	Bhaktapur	775	Bagmati	41	Arghakhanchi	790	Lumbini	
2	Dhading	6,745		42	Gulmi	1,630		
3	Kathmandu	1,312		43	Kapilvastu	4,483		
4	Kabhrepalanchok	9,068		44	Nawalparasi	10,205		
5	Lalitpur	1,541		45	Palpa	6,515		
6	Nuwakot	3,304		46	Rupandehi	7,417		
7	Rasuwa	460		47	Baitadi	44		Mahakali
8	Sindhupalchok	1,332		48	Dadeldhura	129		
9	Banke	4,401	Bheri	49	Darchula	295	Mechi	
10	Bardiya	8,726		50	Kanchanpur	11,094		
11	Dailekh	132		51	Ilam	4,166		
12	Jajarkot	15		52	Jhapa	21,813		
13	Surkhet	2,924	Dhaulagiri	53	Panchthar	721	Narayani	
14	Baglung	799		54	Taplejung	115		
15	Mustang	14		55	Bara	4,551		
16	Myagdi	974		56	Chitwan	17,458		
17	Parbat	865	Gandaki	57	Makwanpur	21,888	Rapti	
18	Gorkha	5,665		58	Parsa	831		
19	Kaski	16,258		59	Rautahat	2,002		
20	Lamjung	9,408		60	Dang	10,798		
21	Manang	0	Janakpur	61	Pyuthan	1,257	Sagarmatha	
22	Syangja	7,621		62	Rolpa	42		
23	Tanahu	18,050		63	Rukum	59		
24	Dhanusa	661		64	Salyan	163		
25	Dolakha	1,446	Karnali	65	Khotang	61	Seti	
26	Mahottari	1,493		66	Okhaldhunga	194		
27	Ramechhap	1,432		67	Saptari	486		
28	Sarlahi	5,019		68	Siraha	757		
29	Sindhuli	6,791	Koshi	69	Solukhumbu	100	Total	
30	Dolpa	4		70	Udayapur	4,701		
31	Humla	2		71	Achham	17		
32	Jumla	6		72	Bajhang	267		
33	Kalikot	90	Koshi	73	Bajura	5	Total	
34	Mugu	8		74	Doti	104		
35	Bhojpur	271		75	Kailali	16,192		
36	Dhankuta	2,410		Total		2,90,509		
37	Morang	12,110	Koshi					
38	Sankhuwasabha	466						
39	Sunsari	4,843						
40	Terhathum	1,719						

Annex 9: Investment on Biogas Plants – Subsidy, Cash and Loan

Phase	Fiscal Year		Subsidy (Rs)	No. of Cash Plants	No. of Loan Plants	Total Plants
	A.D.	B.S.				
I	1992/93	2049/50	28,872,000	192	3126	3318
I	1993/94	2050/51	30,776,000	571	2935	3506
II	1994/95	2051/52	44,175,000	1203	3914	5117
II	1995/96	2052/53	61,838,000	2142	5015	7157
II	1996/97	2053/54	73,333,000	3398	4989	8387
III	1997/98	2054/55	85,074,000	4134	5735	9869
III	1998/99	2055/56	94,457,000	4753	6299	11052
III	1999/00	2056/57	111,900,000	8282	4983	13265
III	2000/01	2057/58	153,360,000	12923	4934	17857
III	2001/02	2058/59	125,148,500	11801	3726	15527
III	2002/03	2059/60	131,991,000	13153	3187	16340
III	2003/04	2060/61	78,414,000	9479	1780	11259
IV	2004/05	2061/62	120,853,000	15006	2797	17803
IV	2005/06	2062/63	107,744,000	13749	2369	16118
IV	2006/07	2063/64	135,269,000	14093	3570	17663
IV	2007/08	2064/65	115,028,000	10365	4519	14884
IV	2008/09	2065/66	216,165,900	13569	5910	19479
IV	2009/10	2066/67	239,526,100	16626	4532	21158
	2010/11	2067/68	228,606,800	16218	3443	19661
	2011/12	2068/69	209,869,800	15975	3004	18979
	2012/13	2069/70	608,458,200	21945	165	22110
	Total		3,000,859,300	209,577	80,932	290,509

Annex 10: BCU Progress by Fiscal Year 2069/70

SN	Fiscal Year	Disbursed Loan	Outstanding Loan	No. of Loans	Installed No. of Plants - Planned	Installed No. of Plants - Actual
1	2058/2059	3,037,500	3,037,500	20	243	838
2	2059/2060	8,669,250	9,949,514	39	686	575
3	2060/2061	5,538,500	9,772,109	20	444	431
4	2061/2062	16,210,000	18,670,974	56	1099	1152
5	2062/2063	28,473,202	36,404,883	36	1886	1091
6	2063/2064	27,979,260	52,304,581	33	1735	1367
7	2064/2065	52,546,171	67,610,719	58	2643	3881
8	2065/2066	90,058,096	122,485,018	68	3943	6154
9	2066/2067	59,866,493	130,688,114	50	2428	7799
10	2067/2068	27,617,950	111,139,576	34	1106	1286
11	2068/2069	5,280,186	50,843,859	5	219	392
12	2069/2070	26,245,200	47,234,075	53	1050	1050
13	2070/2071	0	45,973,014	0	0	0
Total		351,521,808	45,973,014	472	17482	26016