Third Meeting of Network of Experts on Domestic Biogas Quality Control

March 26-27, 2007
Dhaka, Bangladesh

A Brief Overview of Activities and Outcome of Discussions

April, 2007

Table of Contents

1. Introduction

SNV has been supporting for the promotion and extension of biogas technology in Nepal since 1992, in Vietnam since 2003, in Laos, Bangladesh, Cambodia and Rwanda since 2005 and in Ethiopia since 2006. Under the framework of Asia Biogas Program (ABP), SNV has been supporting these countries to further disseminate Biogas technology at the grassroots level. The overall objective of the Asia Biogas Programme (ABP) is to further develop the market for biogas as an indigenous, sustainable energy source in selected countries in Asia. Under the framework of one of its major specific objectives to establish strategic partnerships with relevant institutes in Asia by creating a regional network of partners in biogas, ABP/SNV has instituted a regional network of experts working in the field of domestic biogas technology. The first and second meetings of the network members were held in Hanoi, Vietnam and Bangkok, Thailand respectively in April and September 2006. The third meeting of network of experts was organised in Dhaka, Bangladesh during the period March 26-27, 2007.

This brief report summarises the purpose, schedule, country presentations and outcome of discussions related to the Third Meeting of Network of Experts on Domestic Biogas.

2. Objective of the Meeting

The overall objective of the meeting was to create an organised platform for experts working in domestic biogas sector in different countries to share best practices on Quality Control of the technology-dissemination activities at the meso and micro levels.

The following were the specific objectives:

- To familiarise with country programs and associated activities related to quality control of technology-dissemination activities in China, India, Nepal, Vietnam, Bangladesh, Cambodia, Laos and Rwanda.
- To exchange knowledge and information related to the quality control of technology-dissemination activities and share lessons learnt and best practices being adopted in different countries
- To identify the best tools/methods for the quality control and to discuss on issues that facilitates/hinders effective quality control
- To discuss on potential areas of cooperation between the experts

3. Key Agenda

The tentative schedule and key agenda of the 3rd Meeting was agreed upon during the second meeting of experts in Bangkok in September 2006. The Biogas Practice Team Coordinator prepared the detailed schedule of the meeting and circulated it among the potential participants.

He prepared the draft guidelines for the preparation of the country presentations on quality management of biogas technology dissemination activities (Annex-1).

4. Schedule

The meeting was conducted for two days. The following table shows the schedule of activities during the meeting.

Meeting Schedule

Day-1: March 26, 2007	
7:30-13:30	Field visit to under-construction biogas plants for quality check; and operational biogas plants for effect monitoring
13:30-14:30	Lunch
14:30-18:00	Presentation of country papers on Quality Control
Day-2: March 27, 2007	
08:00-11:30	Group work and presentation on Core quality issues
11:30-12:30	Progress overview (Plan of Action as set in Hanoi and Bangkok meetings)
12:30-13:30	Summarisation and closing
13:30-14:30	Lunch

5. Participants

Participants from China, India, Nepal, Vietnam, Bangladesh, Cambodia, Laos, Rwanda, Ethiopia and The Netherlands took part in the meeting. The following table shows the details of the participants.

List of Participants

SN	Name	Organisation	Address	E-mail
1	Dr. Anjan Kalia	Regional Biogas Development & Training Centre	CSK, H.P . Agriculture University, Palampur 176062 (H.P.) India	anjankkalia@hillagricernet
2	Prof. Zhang Mi	Chengdu Energy-Environment International Corporation	CEEIC, Chengdu, Sichuan, China	zhangmij@sohu.com
3	Ms. Doan Bich Van	MARD/BPO	298 Kim Ma, Ba Dinh, Ha Noi, Vietnam	vandb@biogas.org.vn
4	Mr. Felix ter Heegde	SNV/Vietnam	298 Kim Ma, Ba Dinh, Ha Noi, Vietnam	fterheegde@snvworld.org

5	Mr. Robert van den Heuvel	SNV/Vietnam	298 Kim Ma, Ba Dinh, Ha Noi, Vietnam	rvandenheuvel@snvworld.org
6	Mr. Bastiaan Teune	SNV/Vietnam	298 Kim Ma, Ba Dinh, Ha Noi, Vietnam	bteune@snvworld.org
7	Mr. Jan Lam	SNV/Cambodia	P.O. Box 2590, Phnom Penh, Cambodia	jlam@snvworld.org
8	Mr. Prakash C. Ghimire	SNV/Cambodia	P.O. Box 2590, Phnom Penh, Cambodia	pghimire@snvworld.org
9	Dr. Suon Sothoeun	Department of Animal Health and Production	#74, Monivong Blvd. Phnom Penh, Cambodia	sothoeundahp@online.com.kh
10	Mr. Sundar Bajgain	SNV/Nepal	Bakhundole, Lalitpur, Kathmandu, Nepal	sundar_bspnepal@yahoo.com
11	Mr. M. Ashrafuzzaman	Infrastructure Development Company Ltd.	G.P.O. Box 619, Dhaka-1215, Bangladesh	azaman@idcol.org
12	Mr. Christopher Kellner	SNV/Nepal	Bakhundole, Lalitpur, Kathmandu, Nepal	ckellner@snv.org.np
13	Mr. Uttam Prasad Jha	SNV/Nepal	Bakhundole, Lalitpur, Kathmandu, Nepal	ujha@snv.org.np
14	Mr. Saroj Rai	BSP-Nepal	Bakhundole, Lalitpur, Kathmandu, Nepal	srai@bspnepal.wlink.com.np
15	Mr. Ndahimana Anaclet	SNV/Rwanda	P.O. Box 1049, Kigali, Rwanda	andahimana@snvworld.org
16	Mr. Willem Boers	SNV/Ethiopia	Addis Abba, Ethiopia	
17	Mr. Kidane Workneh Fufa	Ethiopian Rural Energy Promotion and Development Centre (EREPDC)	Addis Abba, Ethiopia	kidane_workneh@yahoo.com
18	Mr. Andrew Williamson	SNV/Lao PDR	Nongbone Road, Vientiane, Lao PDR	andrew@biogaslao.org
19	Mr. Ivo Besselink	SNV/Lao PDR	Nongbone Road, Vientiane, Lao PDR	ibesselink@snvworld.org
20	Mr. Thong Xaysombath	SNV/Lao PDR	Nongbone Road, Vientiane, Lao PDR	pxaysombath@snvworld.org
21	Mr. Deepak Uprety	SNV/Lao PDR	Nongbone Road, Vientiane, Lao PDR	duprety@snvworld.org
22	Ms. Surapha Viravong	Biogas Pilot Programme, Laos	Vientiane, Lao PDR	surapha@biogaslao.org
23	Mr. Willem van Nes	SNV/HQ	Bezuidenhoutseweg 161, The Hague, NL	nesvliet04@yahoo.co.uk

6. Process and Outcome

6.1 Day-1: Morning Session-Field Visit

The activities of the first day of the meeting started with the field visit to biogas households in three different locations in Gazipur district. Participants (Members of Expert's Network) were divided into three groups and the agenda of the field visit was discussed prior to the departure of the participants to the respective sites. The participants were provided with quality control forms being used by National Domestic Biogas and Manure Programme (NDBMP), Bangladesh; and other related documents. The staff members of NDBMP and respective biogas construction agencies facilitated the visit to the selected biogas households.

The participants visited under-construction biogas plants and collected information on various aspects of the installation from the mason and the owner. They filled the quality control forms at the site. The participants also observed the physical status and functioning of operational biogas plants and collected related information.

The field visit has been instrumental in enhancing the knowledge of the participants on various aspects of construction and quality control of biogas plants being practiced in NDBMP. Observation of the biogas plants, under-construction and operational, as well as discussions with the masons and owners of the biogas plants have been beneficial in getting acquainted with the technology at the deeper level. Moreover, filling of the quality control forms at the construction sites helped the participants in familiarisation of the methodology being practiced by NDBMP in controlling quality of under-construction biogas plants.

The group of participants who visited the construction sites of Grameen Sakti, one of the construction partners of NDBMP, were welcomed in their regional office and briefed on various biogas related activities being undertaken by them.

6.2 Day-1: Afternoon Session - Meeting on Quality Control

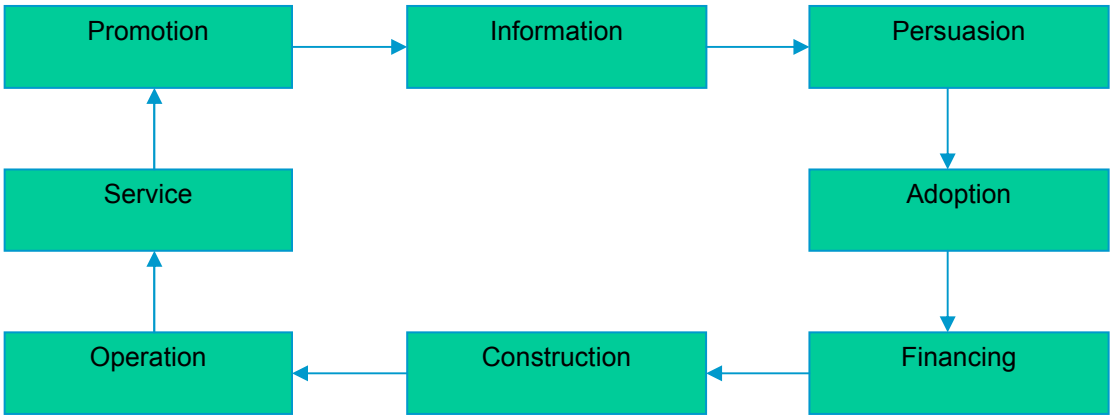
6.2.1. Opening and Introduction

The meeting started with opening remarks from Mr. Wim van Nes, Biogas Practice Team Leader. He welcomed the participants and highlighted the processes and outcomes of two previous meetings in Hanoi and Bangkok. He then introduced the theme of the meeting, 'Quality Control' and highlighted the importance of the effective quality control systems in promoting biogas technology at the grassroots communities. He thanked the NDBMP team for their willingness and commitments to organise this meeting in Dhaka, Bangladesh.

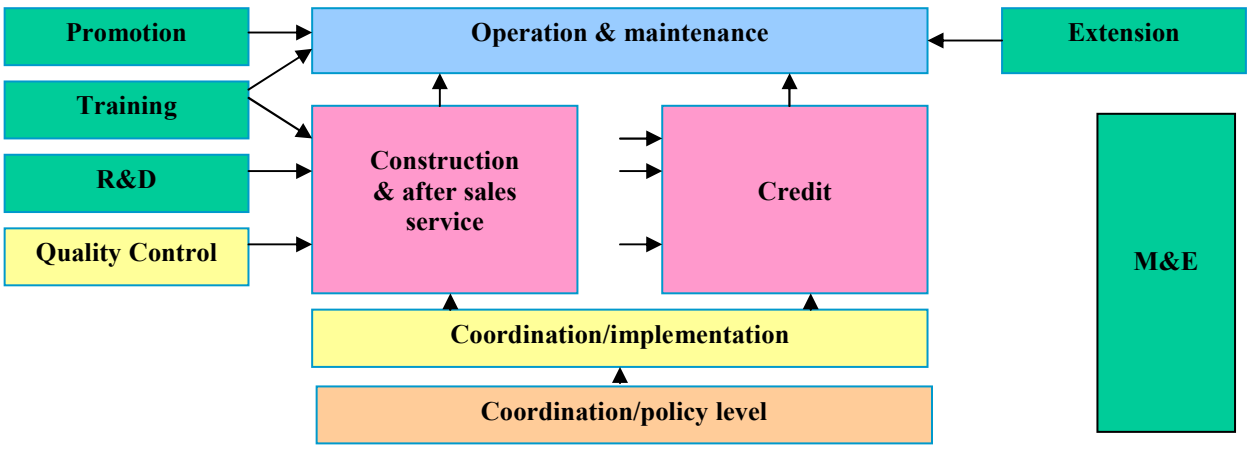
The participants then introduced with each other. This introduction session was followed by the presentation of Mr. Wim van Nes on the Theme of the meeting, 'Quality Control within Biogas Programmes'. He focussed his presentation on the following two questions:

- How to establish and control the quality of the operation of domestic biogas plants?
- How to make use of the results of quality control for improvements?

Emphasising on the reality, 'you get what you inspect, not what you expect', Wim described the importance of quality control at every steps of the implementation of any biogas programme as given in the following diagram.



Wim pointed out the need of effective quality control not only during construction of a biogas plant but also in the process of promotion, information dissemination, operation and after-sales-services. He recapitulated the functions in any national biogas programmes as given in the following figure and described the significance of quality control in each function.



He urged the presenters of the country papers to pay attentions to the following questions while their deliberations:

- Which quality standards have been set in your programme/country for the design and construction materials, the construction work, and training of the workforce? Are the standards controlled and enforced? If yes, how?
- Are the results of the quality control used to improve the design and construction materials, the construction work, and training of the workforce? If yes, how?
- Which quality standards have been set in your programme/country for the optimal operation of the biogas plants? Are the standards controlled and enforced? If yes, how?
- How are the customers instructed?
- How is ensured that customers make proper use of the bio-slurry?
- Which quality standards have been set in your programme/country for the after sales service? Are the standards controlled and enforced? If yes, how?
- Are the results of the quality control used to improve the after sales service? If yes, how?
- Which guarantee is provided?
- If the carbon credits (CERs and/or VERs) of biogas plants are sold for a period of 7-10 years, how to ensure the quality of operation during this long period?

6.2.2. Presentation of Country Papers on Quality Control

The presentation of Mr. Wim van Nes on the theme 'quality control' was followed with the country papers on quality control from Bangladesh, China, India, Nepal, Vietnam and Cambodia.

a. Bangladesh

Mr. Sundar Bajgain, Senior Advisor in National Domestic Biogas and Manure Programme (NDBMP), presented the quality control procedures and practices being followed in Bangladesh and highlighted associated challenges to enforce the quality standards. According to him, the biogas plants being constructed by Construction Partner Organizations (CPO) as per quality standards are monitored and checked by quality inspectors (under-construction plants on random sampling basis - about 10-15% of the total numbers; all the completed plants; and plants with complains from users) from Infrastructure Development Company Limited (IDCOL), which is the NDBMP implementing partner of SNV. The works of quality inspectors are further monitored and supervised by a technical officer from IDCOL. The IDCOL technical officer and SNV advisor also visit some plants selected randomly to validate the data and information collected and reported by the quality inspectors. Mr. Bajgain explained the penalty system in practice to discourage non-compliances of quality standards by CPOs. He also described the

bonus mechanism to encourage the CPOs who act in accordance with the quality standards. Mr. Bajgain also highlighted the associated challenges in effective quality control due to the existing mind set of CPOs to construct biogas plants with out any quality standards, temporary nature of cattle holdings in households and difficulty in institutionalization of quality control system within programme and CPO levels.

Queries ware raised by Mr. Jan Lam and Mr. Uttam Jha on effective management of field data and impact of quality control system on institutionalization of CPOs.

b. China

Presenting his paper entitled 'Quality Control in the Biogas Programme in China', Mr. Zhang Mi, Managing Director of Chengdu Energy-Environment International Corporation (CEEIC) introduced the "the standards for check and acceptance of the quality for household hydraulic biogas digesters in rural areas in China". He also highlighted 'the operation rules for construction of household hydraulic biogas digesters in rural areas - suitable to biogas digester works based on the GB4750-84'. He described the quality standards on: (a) site selection for construction of biogas plant, (b) earth work in excavation and preparation of mould for construction, (c) concreting and other construction works, and (d) sealing and coating of gas holder. Mr. Zhang told that the quality standards have been put into practice since 1985 at different levels of biogas dissemination offices, companies and other concerned agencies in the whole country. He told that there are many biogas plants in China which were constructed without paying proper attentions to quality standards resulting in poor functional status. He told that the compliances, at present, are checked and controlled by authorized and accredited biogas agencies which are provided with special training courses for their technicians and construction workers to become qualified on doing so. According to Mr. Zhang, the quality of construction of biogas plants has been improved after 1985 when the standards were introduced and enforced. He also mentioned that the standards were revised to adapt to new design, construction materials etc. in 1990s.

Concluding his presentations Mr. Zhang acquainted with the following procedures and activities in practice in China to ensure the compliances of the quality standards:

- Formulation of rules and regulations by the national and/or provincial biogas offices or institutes based on scientific research and practice in different areas;
- Training to and certification of managers, engineers, technicians and skilful labours prior to the contract agreement with them to undertake responsibilities to construct biogas plants;
- Use of different IEC materials and propaganda mechanisms including mobilising media such as newspapers, TV and radios, VCDs, user's manual etc. to aware the users on quality standards;
- Monitoring and checking for quality control in newly-built plants by specialised teams;

- Regular checking from certified biogas technicians for assessing the status of operation and after sale services;
- Trouble-shooting and treatments in defective biogas plants by biogas service stations.

Mr. Zhang also shared his experience on the causes of the failure of some biogas plants in Kenya. According to him, farmers without cattle were also selected to install biogas plants as the neighbours of such farmers were ready to contribute dung free of cost to them. Later when the neighbours realised the benefits the user is enjoying from biogas plant, they asked much higher sum to be paid for the dung. Failure to pay the sum claimed by the dung-owners ultimately led to the closure of biogas plants.

Mr. Christopher Kellner wanted to know if the subsidy being provided by the government to install biogas plant is related to quality control or vice versa. Mr. Jhang's answer was in affirmation.

c. India

Mr. Zhang's presentation was followed by the presentation of Dr. Anjan Kalia from Regional Biogas Development & Training Centre, Department of Agricultural Engineering, CSK H.P. Agriculture University, India, entitled, 'Glimpses of Biogas Technology in Rural India'. Dr. Kalia highlighted various issues related to promotion, installation and extension of biogas technology in India.

Replying to a query from Mr. Christopher Kellner on the linkages of subsidy and quality control, Dr. Kalia told that quality control of biogas plant is mandatory whether the subsidy is provided or not. Mr. Uttam Jha wanted to know if all the biogas plants are ISO certified. Dr. Kalia made it clear that the biogas plants are not ISO certified.

d. Nepal

The Nepal country paper on 'Quality Control in BSP' presented by Mr. Saroj Rai, Executive Director of BSP-Nepal, mainly focussed on the history of comprehensive quality control mechanism within the framework of Biogas Support Programme/SNV Nepal that was formulated and enforced from the very first phase of the programme in 1993/94. He highlighted the standards on 4 quality indicators (production, default, penalty & feeding) that were formulated mainly for construction of plants in the first phase of the programme and the other standards on two more indicators (accuracy in reporting and maintenance) related to operation and After-Sales Service (ASS) that were added in Phase II. According to him, some standards on another quality indicator (ASS progress) were added in the Phase III of BSP and because of the effectiveness of enforcement of all these standards, two core BSP Activities (Quality Control and Subsidy Administration) achieved ISO Certification at the end of Phase III.

Mr. Rai then described the process of quality control of the construction of biogas plants as follows:

- Simple random sampling method is used to select 5% sample biogas plants from among the list of under-construction plants being installed by biogas companies.
- Random sampling is also done for plants in the 2nd and 3rd years of operation for quality control of After Sales Services. The sample size for this is also 5% each year.
- BSP quality control staff members, after selecting the plants, inspect the sampled biogas plants for quality control.
- All the data and information collected from the field is entered to Oracle based BSP database (the data supplied by biogas companies at the time of subsidy application are also entered in the database).
- These data form the basis for the calculation of Biogas Performance Index (BPI) of each biogas company. The BPI figures are used for company grading, reward, penalty, disqualification, allocation of quota, etc.
- Reporting to Companies on their performance and areas of improvement is done through Early Warning Reports (after each field trip) and Annual Report (comprehensive reporting after BPI calculation, grading, etc.)

Mr. Rai shared the effectiveness of the BSP Quality Standards Manual in which minimum standards for all the construction materials and appliances have been described. He also explained other miscellaneous tools such as user's photographs, copy of citizenship certificate, use of GPS, encoding of dome gas pipe, introducing of pressure gauge etc. used to check, verify and control the activities of the biogas companies. He told that BSP is considering absolute grading systems, additional bonus on proper utilisation of bioslurry, partial outsourcing of QC job to expert institutions as BSP is overloaded due to increasing works, and strengthening of quality control system with in biogas companies. He also told that Alternative Energy Promotion Centre within the government ministry, CDM verifier and consultant through annual Users' Survey, are also involved in quality control of the biogas programme in Nepal.

Mr. Rai concluded that effective quality control mechanism, demonstrational effects, capacity building of biogas companies and other grassroots stakeholders, and awareness on cost and benefits at the user's level are instrumental in promoting biogas technology in Nepal.

Mr. Jan Lam asked for further clarifications on two issues: building of quality control system within biogas companies, and awareness building of stakeholders on quality control. Mr. Rai mentioned that the prime objective of these two activities is to make the company personnel aware of the 'why' part of quality standards and minimise the reliance of companies on BSP for each and every task of quality management.

Mr. Zhang put forth a question on the potential risk of plant failure after the completion of 3 years guarantee period. He was curious to know if there are any mechanisms developed in Nepal to ensure the quality of operational activities even if the users fail to carry out operation and

maintenance activities as anticipated. Mr. Rai pointed out the compulsion of BSP to ensure the functional status of all the plants under the CDM regime. He also highlighted the effectiveness of user's training as well as availability and access of spare parts in the local market to ensure the continued functioning of any biogas plants.

Replying to the query of Dr. Sothoeun if the users' voices are heard while formulating and enforcing quality standards, Mr. Rai told that the Biogas Users' Survey which is carried out each year, provides rooms for users' say and the outcome of the survey provides impetus to include the voices of users.

e. Vietnam

Ms. Doan Bich Van of Biogas Project Division (BPD) of Ministry of Agriculture and Rural Development (MARD) presented her paper on quality control system in Vietnam. According to her, the role and responsibilities of quality control of the biogas related activities are shared among the stakeholders at various stages. She described the roles of farmers (the users), biogas construction technicians (masons), district biogas technicians, provincial biogas project division (PBPD) and biogas project division at the national level in quality control. Biogas Construction Technicians are responsible for the construction of biogas plants and to ensure effective after-sales-services adhering to the national quality standards. District biogas technicians are involved in acquisition, pre and post construction training to the users, supervision of construction activities, acceptance and annual check of biogas plants. Likewise, provincial biogas project division carries out the tasks of contracting, quality control of under-construction and completed plants and training of masons. The main tasks of biogas project division are organising training for biogas technicians, validation of quality control works carried out by provincial technicians, conducting refresher trainings and carry out annual biogas user's surveys.

Ms. Van highlighted on the different forms and formats developed to facilitate the quality control activities. According to her, though there is not strict quality enforcement system in place to check the compliances, BPD is considering some penalty provisions in terms of withholding quota, suspending mason's from works or any other suitable provisions in the near future. She also described the present system of organising provincial level QC meetings to discuss on issues related to findings of QC visits. Concluding her presentations, Ms. Van talked about the need of carrot on the stick to encourage and streamline the process of effective quality control within any biogas programme.

Mr. Andrew Williamson asked if there are any standards developed within BPD for the delivery of services by masons and technicians. Ms. Van told that there are no such standards in practice but the voices of the users are heard to make the service more effective.

On Ms. Van's deliberation that demonstration plants are constructed in different locations in Vietnam, Mr. Jan Lam wanted to know if there is any relationship of quality control with these

plants. Ms. Van told that these plants are constructed to facilitate the promotion of biogas technology in the country, not to raise awareness on quality control.

Similarly, Mr. Sundar Bajgain raised the issues if the penalty provision will be enforceable in Vietnam given its socio-political situation. Ms. Van made it clear that BPO is just in the early stage of formulating penalty mechanism and hence nothing can be spelt clearly at this instance.

f. Cambodia

Mr. Jan Lam, Sr. Biogas Advisor from SNV Cambodia presented his paper on Quality Management within the National Biodigester Programme (NBP), Cambodia. He stressed that the non-functioning and poorly functioning biogas plants cause not only capital wastes but also harm the reputation of biogas technology and eventually to the desired establishment of permanent biogas sector. He emphasised the use of the term quality management than quality control. He told that NBP Cambodia relates quality management to the following aspects of technology dissemination:

- Quality of the design of biogas plants
- Quality of capacity building of supervisors and masons
- Quality of information dissemination and communication (quality of promotional and marketing activities)
- Quality of construction
- Quality of operation and maintenance by the users and technical backstopping from the installer
- Quality of after-sales-services on behalf of the installer
- Quality of the process of validation of data and information collected during quality control visits

Mr. Jan Lam described the quality management cycle in which learning and feedback in each steps of programme implementation provides impetus to fine-tuning design, technical standards, methodology and practices. He emphasised that the quality standards are compromise between cost and performance.

He then highlighted the process and practices of quality control within NBP Cambodia in each of the seven aspects of technology dissemination as described above. He emphasised the need of a well-managed user-friendly database to monitor the findings of quality control visits and shared few examples of the results of analysis from the database being managed in NBP Cambodia. Finally, he highlighted the importance of control of quality control activities to validate the reliability, authenticity and conformity/consistence of data and information collected form the field level staff.

Mr. Christopher Kellner and Mr. Saroj Rai raised concerns over the quality standards on the utilisation of bioslurry and mechanisms to ensure that the installer response the grievances on

time. Likewise, Ms. Surapha and Mr. Uttam Jha had queries on monitoring of compliance of guarantee provisions and areas of major defaults respectively. Dr. Kalia asked what happens if the masons after receiving training and constructing some defective plants run away. Mr Jan Lam pointed out the need of selecting right person for the training of masons. He told that not all the masons will run away. Those masons who are active, committed and responsive will take over the role of those masons who flee the scene.

6.3 Day-2: Group Discussion and Presentation

6.3.1 Group Discussion

Mr. Felix ter Heegde initiated the session with the summary of the country presentations on the first day of the meeting. He summarised three core-issues based upon the country presentations which were considered as the core questions for further discussions.

a. **Quality management**: why and for whom? What is the overall objective?
b. **Awareness building within the programme**: How to make each actor responsible for the quality aspects of his/her work?
c. **Empowerment of the clients**: What is needed to make the consumer quality conscious and how to make him/her capable to stand-up for his/her own interests?

The participants were then divided into three groups - each to discuss one issue as mentioned above. The participants were facilitated to focus the discussions on orientation and inspiration for quality management development within biogas programmes. The central question of discussion was 'to what direction quality management should go'? The following dimensions were suggested to be taken into consideration for the group discussions:

- Programme management in terms of activities.
- Economy, time and resources, cost-benefits.
- Ideological/cultural dimensions.

6.3.2 Outcome of Discussions

Mr. Andrew Williamson facilitated the session on presentation of summary of group discussions. He asked the presenters to pin-point most important issue that guide the future quality management system within SNV biogas programmes. The following section provides the outcome of the discussions.

a. Group-1: Objectives of Quality Management

Mr. Uttam Jha and Mr. Bastiaan Tuene presented the summary of discussions on the objectives of quality management. According to them, answers to the following three key questions were sought for while formulating the objective of quality management.

Q-1: What happens without quality control?

Client level
- unsatisfied clients, gossip/negative image, anarchies, loss of investment, land and initiative

Mason level
- losing of quality of biogas plants
- lose of knowledge for masons

Programme level
- waste of resources
- loss of momentum/slow down of distribution
- set back of the programme
- drop out of donors
- programme failure
- management

Q-2: What is quality control from the point of view of different stakeholders?

Client/end users
Good functioning and convenient biogas plant

Management
Need for total quality control system

Q-3: How can we ensure high performing and good quality biogas systems providing fuel, manure and good environment to the beneficiaries?

General umbrella
- Total quality control (TQC)

Client level (End user related)
- Ensure user convenience of operation regarding input and output of plants
- Proper training geared to needs of clients/beneficiaries

Programme level
- Design of the plant should be substrate and region specific
- Adoption of appropriate technologies for slurry management
- Proper selection of beneficiaries/clients, sites in respect of inputs (dung, urine, water, organic matter, night soil) and outputs (GIFT – Gas, Improved Hygiene, Fertilizer and Time saving)

- Focused statistical quality control during and after construction, (ensure feedback to improve quality)
- Proper follow up in quality control set up with emphasize on efficiency of piping system and appliances
- Performance appraisal
- Proper training to masons and supervisors
- Certification of design, masons and companies
- No compromise in quality and quantity of construction materials

Conclusion

- Total quality control (TQC) is essential.
- Effective follow up of quality control endeavours is necessary
- Convenience of operation in quality control is vital.
- Client focus/awareness in quality control is important.

Questions and Clarifications

Questions were raised by Mr. Saroj Rai, Mr. Willem Boers and Mr. Prakash C. Ghimire on various issues such as vagueness of client focus on quality control, concentration more on quality control than quality management, compromise between cost, quality and performance.

b. Group-2: Awareness building within the programme on Quality Management

Mr. Willem Boers presented the outcome of discussion on awareness building within the programmes on quality management. The following was the summary of the presentation:

Present practice

- Approach of Quality Control is more enforcing and controlling than facilitating.

Constraints on quality enforcement:

- Conflicting interests of stakeholders at different levels
    - Programme Level: Commercialisation, long-term market and fund accountability
    - Provincial/supplier's level: immediate targets/short-term benefits
    - User's level: Low-cost product
- Higher cost involved in Quality Management (QM)
- Low consumer awareness on QM vs. benefits

Major issues to be considered:

- Are we becoming more enforcing/controlling (top-down)?
- What are the benefits vs. costs of quality?
- Can quality control at the supplier's level function?
- To what extent can consumer be involved in QM?

- Can we aware all users on QM prior to the construction?

Recommendation
- Integration of QM issues in promotional and extension activities
- Integrate interests of all the stakeholders at different levels in QM system
- Capacitate the suppliers and gradually transfer the task of QM to them.

Questions and Clarifications

Mr. Felix ter Heegde explained that the responsibilities and nature of quality management task differ at different levels. For example, at management level, the responsibility is more on process/functional issues where as at the suppliers level the focus is more on product issue. Dr. Sothoeun told that the users may not be familiar with the quality standards but they are aware of the quality as they have paid for the quality services. Mr. Jan Lam shared his experience in Cambodia that the users are ready to pay for quality biogas plant but they do not know how to monitor the quality. His concern was on the cost involved in quality control as more intensive quality monitoring system adds to the cost of installation. Mr. Sundar Bajgain told that users are more concerned with the quality of construction materials but not on quality of workmanship. In contrary, installers are more concerned with quality of workmanship rather than quality of materials. Dr. Kalia emphasised the need of awareness building at the user's level before the construction works really starts.

c. Group-3: Empowerment (Awareness & Action on Quality

Mr. Robert van den Heuvel presented the outcome of the group discussions on the need to make the consumers quality conscious. He informed that **'a conscious, not an unconscious client'** has been identified as the vision statement for empowering the clients on quality issues. The outcomes of the presentation have been given below:

The basic questions
- How can we make the client/user aware about quality?
- How can the clients express their needs?
- What are the conditions & constraints on empowering the client's on quality?

Starting points
- We want to give clients the feeling that they are in control, can influence product and product improvement.
- Benchmark: how do private companies do this: TV, insurance?
- Decision making process in people's mind.

Client's Empowerment - Why?
- More confident potential clients are more likely to purchase

- Sector sustainability
- Product improvement: design, construction, maintenance
- Product adapted to and adopted by the market

Client's Awareness – How?

- Stakeholder consensus building – *together*
- User group formation - *action*
- Quality promotion – *advertising-like*
- Quality grading & labelling - *visible*

Potential Mechanisms

- List with specifications
- Card for complaints & system
- Card for suggestions and ideas
- User survey for in depth feedback

Condition and Constraints

- Perception that Quality is not the responsibility of the client, but of the donor
- Low level of organization of clients (for user groups, discussion)
- Wrong assumption of constructors that ignorant clients are better to handle

Questions and Clarifications

Mr. Willem Boers wanted to know the definition of 'ignorant client'. According to Mr. Jan Lam, the term ignorant client means such client who knows the benefits of biogas technology but does not know the quality management aspects. He told that the term ignorance in this particular context is used to describe their inability to know about various aspects of quality management. Mr. Felix ter Heegde expressed that the term 'ignorant client' may not be suitable in this context. Mr. Saroj Rai clarified that most often people get overwhelmed by the feeling that they get new things without knowing much about quality.

7. Summary of Group Discussion and Presentations

Summarising the presentation, Mr. Andrew Williamson emphasised that there are many good reasons for quality control and hence, quality management should be an integral component of biogas programme in all the stages. Mr. Wim van Nes stated that the notion of 'sharing of responsibilities of quality management among stakeholders' sounds great, however, it is very difficult for the stakeholders to internalise the process. There are lots of difficulties in coordinating shared responsibilities. Mr. Saroj Rai emphasized the need of formulating and strengthening the internal quality control mechanisms within the stakeholders. According to him, given the higher competition in the market between the installers and increased awareness of the users on quality, the only means for the installer to survive in the market will be quality

management. Mr. Christopher Kellner pointed out the need of integrating investment subsidy with quality management. Dr. Sothoeun cautioned on the adverse impact of sharing of responsibilities if the activities are not coordinated effectively.

Concluding the discussion, Mr. Wim van Nes pointed out the need of biogas programmes in Nepal and Vietnam to transit from quality control to quality management given the maturity of these programmes. Each stakeholder in these countries has to be oriented to share, more importantly, claim the responsibility and formulate country specific sector vision on quality management.

8. Follow-up of Action Plan and Other Issues

The group discussion and presentation on quality management was followed by the reviewing of action plan agreed in the previous meeting of experts in Hanoi and Bangkok. Mr. Wim van Nes moderated the discussions on the following issues as stipulated in Hanoi action plan:

8.1 Testing of Appliances

Terms of Reference (ToR) has been formulated to solicit proposals from recognised institutes on the testing of biogas stoves. The scope of work in this ToR includes the testing of various parameters of biogas stoves from different countries for their efficiencies. Quotations have already been received form potential research and development institutes in Netherlands and India to carry out this task. Quotation is also being collected from China. Mr. Zhang Mi told that he will follow up the progress on submitting the quotation and promised to send it to SNV with in a week.

8.2 Micro-credit

This issue is still pending.

8.3 Bio-slurry Workshop

A two-day international workshop on 'Use of Bioslurry from Domestic Biogas Plants' was organised and conducted during the period 27-28 September, 2006. The workshop; conducted in Bangkok, Thailand; was participated by 51 participants from 13 different countries in Asia, Africa and Europe.

8.4 Dhaka Meeting

The meetings of biogas practice team members and members of expert's network have successfully been conducted in Dhaka.

8.5 Issue of Escape of Methane from Biogas Plants

Mr. Wim van Nes pointed out the importance to minimise, if not eliminate, the leakage of methane from the biogas plant given its adverse impacts to the environment. It is more important for the programme in Nepal from CDM point of view. The escape can be monitored with the mandatory provision of pressure meters in the kitchen and orientation to the users to use biogas if the pressure is in the higher side. BSP Nepal is in the process of conducting a study on this issue.

8.6 Gas Tightness of the Gas Holder (Dome)

Methods of making the gas holder of the biogas plant air-tight differ form one programme to another. The effectiveness of these practices needs to be monitored periodically on plants selected on random sampling basis. Mr. Wim van Nes stressed the need of making the checking of gas tightness of dome an integral component of any biogas programme.

8.7 Comments and feedbacks on Findings of Field Visit

Because of the time constraints, the participants were not able to discuss the findings of the field visit. Mr. Wim van Nes requested all the participants to provide their comments and feedback to the NDBMP, Bangladesh via e-mails.

9. Closing Remarks

Each participant was asked to express his/her closing remarks on the outcome of the two days meeting. The following remarks were made:

Willem:	Enjoyed the meeting. It was beneficial in many ways.
Anaclet:	Very happy to participate in this meeting. Good to learn from different people with different levels of understanding. The theme quality control was very useful and field visit was beneficial.
Saroj:	I fully support the outcome. Issue of gas leakage from biogas plant is very important for BSP Nepal. I request the participants to provide their comments and suggestions on the draft ToR for the study, which will be circulated to the participants in the near future. Where can we get gas meters that are easy to read?
Dr. Sothoeun:	Thank you very much for the sharing. Topic of QC is very important especially for Cambodia. Field visit has been beneficial.
Uttam:	Thank you for the nice arrangements. Let us internalise the outcome of the discussions!
Surapha:	The programme in Laos is new. Learning from this meeting will be very much beneficial and valuable for Laos programme.
Thong:	The topic QC is very important for a new programme like ours. The outcomes of discussions are beneficial.

Christopher:	We should address the convenience of the users and utilisation of bioslurry should be given due importance.
Jan:	World of appreciation to Bangladesh team. Chinese pressure meters, which are being used in Cambodia, are cheap and easy to use.
Andrew:	Many thanks to Bangladesh team. The filed visit was beneficial.
Robert:	Thanks for the sharing. Field visit was good. Good to know new people.
Asraf:	Happy to receive appreciations. Please share the findings of the field visits with us.
Bastiaan:	Thank you very much for the sharing!
Evo:	Thank you very much. Field visit was beneficial.
Van:	The meeting has been beneficial. Thank you for the sharing.
Dr. Kalia:	Thank you for the invitation. Happy to be here. The meeting has been useful and fruitful. Please share the information in the future. Inform me if I can bring some new products. Happy to be involved in R&D.
Kidane:	Thank you. I am happy to be here prior to the commencement of activities in Ethiopia. The learning will be beneficial for our programme.
Sundar:	Sorry for the inability to organise the city cruise.
Deepak:	Happy to learn about the programme challenges particularly in the new programme countries.
Felix:	Dhaka is nicer than expected. Good to get opportunity to go around the city. Thank you Andrew, for your role in moderating the session.
Prakash:	Good to meet the colleagues and share learning. Many thanks to Sundar and his IDCOL team for hosting this meeting.
Wim:	Thank you very much for your active participation in the meeting. The sessions on QC has been challenging and complicated which indicates that the internalisation of the process too is difficult. The next meeting is still undecided. It can be at the end of 2007 or early next year.

10. Evaluation

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

Evaluation Results

Issues	Very poor	Poor	Fair	Good	Very good	Remarks
Hotel Arrangements	4.5%	-	22%	55%	18.5%	- Food and drinks should have been a little more variety. - Hotel arrangement was very good. Less practical was the shifts of venues. - Internet connection in the hotel was often not working. - Meeting rooms very small and uninspiring. - In hot country hotel should have swimming pool (as long as that does not increase the cost). - Moving between hotels is not helpful. - It would have been good if accommodation and meetings were arranged in the same hotel.
Field visit arrangements	4.5%		4.5%	36.4%	54.6%	- Good hospitality of farmers (users). - Good exercise to fill the QC form. - While appreciating the extra efforts that would be needed, visiting the plants with smaller groups would have given an even better impression of the work. - Experienced different aspects of quality control forms. - Good to see the reality. - Excellent and extremely useful. - Good exposure, good opportunity to interview the users, masons and company.
Presentations						- A handout should be given. - China and India presentation were not focused on the theme. The presentation of India included too much issues on the whole biogas programme in India which is irreverent to this meeting. - Time was very short for some of the presentations. - Presentation of India not focussed on QC. - Presentations from India and China were longer and out of topic. - Allow more time for quality presentations and discussions rather than all countries do
Bangladesh			31.8%	59.2%	9%	
China		4.5%	54.5%	32%	9%	
India		41%	50%	4.5%	4.5%	
Nepal			4.5%	45.5%	50%	
Vietnam			9%	45.5%	45.5%	
Cambodia			4.5%	50%	45.5%	
Overall			9%	73%	18%	

						the presentations. - The presentations were well prepared. There were numbers of points to cover – time limit. - Presentations from India and China did not address the theme. - In case a broad topic like QC is discussed with such experienced group, it may go out of the line. External facilitators can be right option in this case. - Focus more on the contents rather than elaborating the same issues. - Presentation from India is too general, does not fit in the agenda topic. - Some presentations are rather long and out of focus in quality control. - Would like to get copies (hard or soft) of the presentations, they may help us in the future.
Group discussions, presentations and plenary discussions			27.3%	45.4%	27.3%	- Discussions in the groups were enthusiastic but more guidance could perhaps been given to move away from the more technical aspects. - Focus is difficult with a large and diverse group. - Very important issues discussed, should be addressed and implemented. - Limited time for discussions. - Lacked clear purpose and outcomes. No one takes responsibilities. Dominated by usual loud voices. - Plenary session confused by moderation. Good English but not mastering the issue. - Brief documentation of proceedings would be very helpful as reference to share with others. - The topic of quality is too bulky to capture in a short time frame. - Topic was rather complicated but group discussion was good.
Overall rating of the meeting	Useless	Not useful	Moderate	Useful 50%	Very useful 50%	- Very good chance to share experiences with all countries and to learn from others. - Good to get new ideas and new information. - Extremely valuable. - Discussions can continue.

						- This is very good opportunity to learn and improve our programme. - Excellent opportunity to networking and sharpening of issues related to quality. - It is useful and should be continued. - Very important for starting programmes.
Comments and suggestions	- Useful meeting. Experiences of various experts were shared which could be applied to new countries - Continue to organise network meeting every year. Next topic for discussion should be how to harmonise the cooperation between stakeholders (donors/government etc.) - The topic of QC should be readdressed in the light of 'Biogas 2020' and 'exit strategy'. - From logistic arrangement point of view, visa formalities were rather difficult, still great job Sundar and Asraf! - My participation in the meeting is satisfactory. I met the expectations on quality control, particularly experiences from different countries. - Let the presentation be screened in advance. India's presentation was waste of time and that of China was long. Any penalty system? - Focus presentations on subjects concerned (check the presentation before). Reward system? - Allow more time for discussions. - We have few very dominant personalities, who are extremely valuable, but we risk losing the input and motivation of other members, especially national counterparts. - Techniques needed to give voice to the whole team (e.g. writing on note cards, posting on boards etc.) - Too short meeting! - This type of meeting should be arranged in every 6 months. - Meeting should be conducted in one place. Duration of the meeting is short. - Complements for the organisers for the excellent set up of the meeting. - It is better that meetings/sessions are arranged at the same hotel if possible. - It will be appropriate if the copy of the proceeding of the meeting/sub-sections be prepared (soft copy) along with the email addresses of the delegates and provided to each delegate for future interactions.					

11. Closing

The meeting came to an end with the vote of thanks from Mr. Wim van Nes. According to him, the next meeting of experts is still undecided. He promised to correspond with the members once the decision is made. However, majority of the participants expressed strong need to organise such meeting bi-annually.

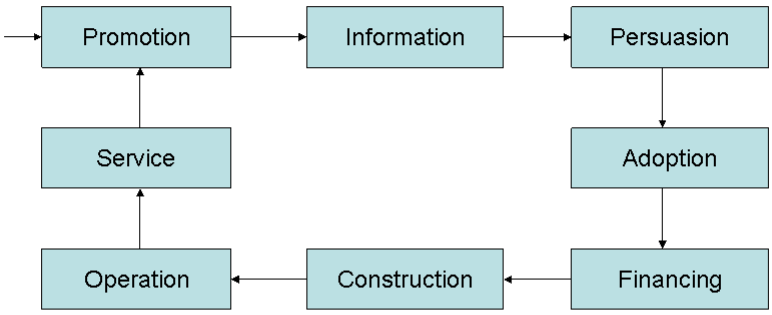
Annex

Guidelines (draft) for the preparation of presentations on quality management.

Introduction

How to establish and control the quality of the operation of domestic biogas plants in your country? This will be the focus of the meeting of experts on domestic biogas to be held in the last week of March, 2007, in Dhaka, Bangladesh.

The following model could be used to distinguish the different phases of dissemination of domestic biogas:



Promotion of biogas towards potential users leads to awareness; reliable information to evaluation; and (personal) persuasion to adoption. After adoption, financing is required before construction can take place. Proper operation and after sale service are critical to keep the biogas plants well functioning which is a pre-condition for credible promotion towards other potential users

The benefits of domestic biogas plants for the customers and the society can only be realised if sufficient quality is observed in all dissemination phases. For example, the promotion needs to be based on realistic information; otherwise the expectations of the customer will never be met by the biogas plant, bringing the optimal operation of the plant in danger. If the provision of biogas credit is affected by unpredicted fees, the customer may get difficulties to repay the loan and become negative about the unit.

For the focus of our presentations and discussions in Dhaka, it is proposed to limit ourselves to the last three phases of this model, being construction, operation and (after sales) service:

- Construction: Which quality standards have been set in your programme/country for the design and construction materials, construction, and training of the workforce? Are the standards controlled and enforced? If yes, how?
- Operation: Which quality standards have been set in your programme/country for the optimal operation of the biogas plants? How are the customers instructed? How is ensured that customers make proper use of the bio-slurry? Are the standards controlled and enforced? If yes, how?
- After sales service: Which quality standards have been set in your programme/country for the after sales service? Which guarantee needs to be provided? What are the standards for the after sales service? If the carbon credits (CERs and/or VERs) biogas plants will sold for a period of 7-10 years, how to ensure the quality of operation during this long period? Are the standards controlled and enforced? If yes, how?

Guidelines for the presentations

The following are the guidelines to be used for the preparation of the presentations:

- Every country with a running biogas programme (China, India, Nepal, Vietnam, Cambodia and Bangladesh) prepares one presentation and it if there two or more persons from one country participating, they could divide the preparatory work among themselves;
- We all know that it is more easy to put standards on paper that to enforce them in practice. Please be frank in addressing also the weaknesses of the quality control system;
- Limit your presentation to maximum 15 minutes;
- Prepare your presentation in PowerPoint or on paper. There will be a beamer and laptop available in Dhaka;
- Finally, it would be nice if you could bring samples of quality control materials (reports, forms) being used in your country to Dhaka.

Hopefully, this information serves its purpose. Wishing you all success in the preparation and please do not hesitate to contact me in case of questions or lack of clarity.

Wim J. van Nes
5 March, 2007