Brief Report

"Training Programme on Renewable Energy:
Community-Based Micro Hydro Power Development for ASEAN Member States"

in cooperation of the Government of Indonesia, ASEAN Foundation and NAM CSSTC

I. Introduction

Demand for electricity is substantially increasing in line with the increasing population number, the growing industry and expansion of housing complex. However, people living in some remote areas still do not have access to electricity. Governments' capacity to supply electricity to their people is limited due to budget shortage, insufficient power plant capacity and other factors. One of the solutions to this problem is micro hydro energy that is relatively cheap, sustainable and appropriate for small communities.

Countries possessing river flows and streams have potential to generate electricity using micro hydro technology, a technology that is environmentally sound and friendly. This technology is emission free and does not attempt to interfere significantly with river flows. In short, micro hydro power plant will benefit the people in two ways: supply of electricity and environment protection. With electricity the community will get more advantage for their income generating activities such as drying agricultural products, saw mill industry, rice milling and other small-scale economic activities.

The Government of Indonesia in cooperation with the ASEAN Foundation and the Non-Aligned Movement Centre for South-South Technical Cooperation (NAM CSSTC) shared its experience with ASEAN member countries through Training Programme on Renewable Energy: Community-Based Micro Hydro Power Development for ASEAN Member States.

The training programme was conducted from 5 to 11 June 2013 in Midtown Hotel, Surabaya. Field studies were conducted at the Micro Hydro Power Plants of Kalimaron and Wot Lemah in Trawas, Seloliman Village of Mojokerto District.

The participants were requested to present their respective country papers on the last session. The 8 (eight) Training Modules were shared in the Class Session, namely: (1) Basic Knowledge of Micro Hydro Power (MHP); (2) Technical Engineering of MHP;

(3) Financial Aspect of MHP; (4) Social and Economic Aspects of MHP; (5) Productive Use of Energy; (6) Community Development; (7) Sustainability Aspect of MHP; and (8) Successful Case of MHP in Seloliman. In addition, there was also lecture entited 'Towards ASEAN Community' shared by the Executive Director of ASEAN Foundation.

On the concluding session the participants also prepared and presented their Action Plans to be implemented in their respective countries when they are back home. In addition they also shared ideas to fomulate collaboration programme post training.

The series of evaluations were also made by using forms as described in the Chapter VII, *pages 6-19.* Participants were also requested to express their expectations to be further discussed in the last session. In conclusion the training is satisfactorily achieved its objectives.

II. Project Achievements

Objectives

(a) The objective of the training programme is to provide participants with the basic knowledge of micro hydro technology and its implementation within the scheme of community-based development in rural area.

The training programme covered the following subjects:

a. introduction to micro hydro development;
b. basic knowledge of technical aspects (mechanical, electrical and civil engineering);
c. financial aspect;
d. community development scheme;
e. social and economic aspects;
f. sustainability aspect; and
g. best practice developed in Seloliman village of Mojokerto District, East Java.

(b) the criteria of successful achievement ara are as follows:

a. participant's expectations were met;
b. training subjects delivered and discussed were relevant and clearly understood;
c. field studies enriched participants with technical aspects of the subjects concerned; and
d. participants could prepare action plans post training.

Actual Outputs

The actual outputs are Action Plans prepared by participants on country basis. In addition, participants also indicated future collaboration post training as described in Table of Possible Future Collaboration on *page 19*.

III. Methodology

The training programme was conducted through:

Class Session:

The session conducted using adult-learning methodology. There is no instruction but knowledge-sharing approach is applied.

Field Session:

Field study to the best practice of micro hydro power plants to see how micro hydro works to generate electric power and how this energy is used for productive activities as well.

Pesentation of Country Report:

Participants were requested to prepare and present their Country Report covering problems and potentials of renewable energy development, especially of micro hydro power. Their knowledge and experiences were shared during the class and field sessions.

Preparation of Action Plan:

At the end of the Class Session, participants were asked to prepare Action Plan supposed to be implemented in their respective countries when they are back home.

Language:

The language used in the Training Programme is English.

IV. Programme Activities

The Training Agenda was organized as follows:

Date	Session	Programme of Activity
Wed, June 5	09.00 – 10.00	**Opening Ceremony**
	10.00 – 10.15	Coffee break
	10.15 – 12.00	- Briefing on the Programme and Logistics by Achmad Rofi'ie and Christina Sudiro - Presentation on Towards ASEAN Community by Makarim Wibisono - Basic Knowledge of Micro Hydro Power by Kusetiadi Raharjo
	12.00 – 13.00	Lunch break
	13.00 – 15.15	- Basic Knowledge of Micro Hydro Power by Kusetiadi Raharjo
	15.15 – 15.30	Coffee break
	15.30 – 18.00	- Technical Engineering of Micro Hydro Power by Priyono Sutikno

Thu, June 6	08.00 – 09.30	- Technical Engineering of Micro Hydro Power by Priyono Sutikno
	09.30 – 09.45	Coffee break
	09.45 – 10.30	- Technical Engineering of Micro Hydro Power by Priyono Sutikno
	10.30 – 12.00	- Financial Aspect of Micro Hydro Power by Chayun Budiono
	12.00 – 13.00	Lunch break
	13.00 – 14.30	- Financial Aspect of Micro Hydro Power by Chayun Budiono
	14.30 – 15.45	- Social and Economic Aspects of Micro Hydro Power by Kusetiadi Raharjo
	15.45 – 16.00	Coffee break
	16.00 – 17.00	- Social and Economic Aspects of Micro Hydro Power by Kusetiadi Raharjo
	17.00 – 18.00	- Productive Use of Energy by Amalia Suryani
Fri, June 7	08.00 – 09.45	- Productive Use of Energy by Amalia Suryani
	09.45 – 10.00	Coffee break
	10.00 – 12.00	- Community Development by Salman Noersiwan Bachtiar
	12.00 – 13.00	Lunch break
	13.00 – 13.45	- Community Development by Salman Noersiwan Bachtiar
	13.45 – 15.00	- Sustainability Aspect of Micro Hydro Power by Agus Maryono
	15.00 – 15.15	Coffee break
	15.15 – 17.00	- Sustainability Aspect of Micro Hydro Power by Agus Maryono
	17.00 – 18.00	- Successful Case of Micro Hydro Power Plant of Seloliman by Suroso
Sat, June 8	07.30 – 18.00	- Field Study to MHPs (Kalimaron and Wot Lemah) in Seloliman Village (Facilitators: Suroso, Faisal Rahadian, Sentanu Hindrakusuma)
Sun, June 9		- Briefing on Action Plan by Achmad Rofi'ie - Start of Preparation of Action Plan by Participants
Mon, June 10	08.00 – 10.00	- Presentation of Country Reports by Participants (Facilitators: Christina Sudiro and Vina Novianti)
	10.00 – 10.15	Coffee break
	10.15 – 12.00	- Preparation of Action Plan by Participants
	12.00 – 13.00	Lunch break
	13.00 – 15.15	- Preparation of Action Plan by Participants
	15.15 – 15.30	Coffee break
	15.30 – 18.00	- Presentation of Action Plan by Participants (Facilitators: Faisal Rahadian and Sentanu Hindrakusuma)
Tue, June 11	08.00 – 09.30	- Post Training Collaboratio (Facilitators: Faisal Rahadian and Sentanu Hindrakusuma)
	09.30 – 09.45	Coffee break
	09.45 – 11.00	- Check Expectations (Facilitators: Christina Sudiro and Vina Novianti) - Overall Evaluation by Participants
	11.00 – 12.00	**Closing Ceremony**

V. Participants

Total participant is 16 persons from ASEAN member countries, namely: Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.

They are from the government institutions, state-owned energy institution and university. Details are as follows:

No	Country	Name	Office
1	Cambodia	Mr. So Veasna	Ministry of Industry, Mines and Energy
2	Cambodia	Mr. Hean Veasna	Ministry of Industry, Mines and Energy
3	Indonesia	Mr. Syukri Yunus	University of Andalas
4	Indonesia	Mr. Safi'i A. Rachman	Micro Hydro Power Plant of Seloliman
5	Lao PDR	Mr. Syvang Xayyavong	Ministry of Energy and Mines
6	Malaysia	Mr. Azhaili Baharun	Universiti Malaysia Sarawak
7	Malaysia	Mr. Haniff bin Ngadi	Sustainable Energy Development Authority
8	Myanmar	Mr. Kyaw Myat Htoo	Ministry of Electric Power
9	Myanmar	Mr. Win Tun Lin	Ministry of Electric Power
10	Philippines	Mr. Silverio T. Navarro	Asian Development Bank
11	Singapore	Mr. Nur Azha Putra	Energy Studies Institute
12	Singapore	Mr. Htet Lin	Energy Studies Institute
13	Thailand	Mr. Pheeraphong B.	Ministry of Energy
14	Thailand	Mr. Suriya Kaewiam	Royal Irrigation Department
15	Vietnam	Mr. Le Thai Anh	Vietnam Electrical Engineering Association
16	Vietnam	Mr. Vu Duy Duong	Institute for Hydropower and Renewable Energy

VI. Resource Persons and Facilitators

Resource persons and facilitators are from the Indonesian Ministry of Energy and Mineral Resources, Universities, Indonesia Power, the Association of Hydro of Bandung and Its Network, Board of MHP Plant of Seloliman and GIZ. Details are as follows:

No	Name	Institution
1	Mr. Makarim Wibisono	ASEAN Foundation
2	Mr. Priyono Sutikno	Bandung Institute of Technology
3	Mr. Kusetiadi Raharjo	PT. Heksa Prakarsa Teknik Small Hydropower Engineering
4	Mr. Chayun Budiono	PT. Chazaro Gerbang International
5	Ms. Amalia Suryani	Deutsche Gesellschaft fur Internationale Zusammenarbeit
6	Mr. Salman N. Bachtiar	PT. Indonesia Power
7	Mr. Agus Maryono	University of Gajah Mada
8	Mr. Suroso	Seloliman Environmental Education Foundation
9	Mr. Sentanu Hindrakusuma	Bandung Hydro Association
10	Mr. Faisal Rahadian	Bandung Hydro Association

VII. Expectations and Evaluation

Prior to the starting session, all participants were requested to expres their expectations in written form using the form prepared by the Committee. Their expectations were compiled by subject of concerns and openly discussed at the ending session. They all together checked whether their expectations were met or not. There were also post-class and post-field evaluation by subjects. Overall evaluation was also made before the Closing Session.

The results are as follows:

1. Check Participant's Expectations:

No.	EXPECTATIONS	MET			NOT MET		
		10	8	6	4	2	0
I	**ON THE GENERAL KNOWLEDGE RELATED WITH RENEWABLE ENERGY**						
1	I hope to learn more experience and knowledge of the technical for developing Micro Hydro Power from this training. (So Veasna, Cambodia)		√				
2	I hope that, this training will provide the knowledge and experience related with renewable energy, especially for Micro Hydro Power for rural communities. (Hean Veasna, Cambodia)		√				
3	To know about Renewable Energy inside deeper. How a renewable suitable for certain area (Syukri Yunus, Indonesia)			√			
4	I hope this training can contribute the knowledge for developing programme on Renewable Energy in my Centre because we have alternative energy for students that visit in our Centre for field research (Syafi'i A. Rahman, Indonesia)		√				
5	How to develop renewable energy for sustainable? What parameters we should consider? (Syvang Xayyavong, Lao PDR)	√					
6	The latest power of energy (batteries, etc.) sustainable development (Azhaili Baharun, Malaysia)						√
7	- Awareness approach to the public and local authority. - Incentive (Haniff bin Ngadi, Malaysia)				√		
8	I am Assistant Director from Dept. of Hydro Power Planning, and also responsible for Coal-fired Thermal Power projects. Renewable Energy is really important and we have to sustain this resources in cooperation with each other (Kyaw Myat Htoo, Myanmar)		√				
9	On generally, Micro Hydro Power to develop in many ways. (Win Tun Lin, Myanmar)		√				
10	Technical, Social, Financial business models, policy and regulation, best practices, networking with project developers, institutions, equipment supplier, technology, provider, and practitioners in ASEAN countries. (Silverio T. Navarro, Jr)		√				
11	I am not trained in engineering therefore I hope to gain a deeper	√					

	understanding on the technical aspects of hydro & micro hydro. (Nur Azha Putra bin Abdul Azim, Singapore)						
12	- Broad overview - Each technology limitations, Pro & Con (Htet Lin, Singapore)		√				
13	- Civil engineer - Mechanical engineer - Electrical engineer - Financial - Social & Economic (Pheeraphong Boonsang, Thailand)		√				
14	Financial, social & economy, civil & mechanical engineering (Suriya Kaewiam, Thailand)		√				
15	I want to know more knowledge related with renewable energy of Indonesia: Environment, Mineral resource (Le Thai Anh, Vietnam)			√			
16	Renewable Energy: - Natural - Good for environment - Mineral resources: Sun, wind, water - Micro Hydro Power (Vu Duy Duong, Vietnam)		√				
II	**ON THE BASIC TECHNICAL ASPECTS OF BUILDING AND DEVELOPING MICRO HYDRO POWER PLANT**						
1	Technical Engineering of Micro Hydro Power, Financial Aspect of Micro Hydro Power, Social and Economic Aspects of Micro Hydro Power and Community Development. (So Veasna, Cambodia)		√				
2	I also hope that this training will improve my knowledge, technical to developing and maintenances Micro Hydro Power. (Hean Veasna, Cambodia)		√				
3	How to make feasibility study (FS) and detail engineering design (DED) of Micro Hydro Plant (Syukri Yunus, Indonesia)		√				
4	As media for alternative energy programme in our Centre for educating to the people (Syafi'i A. Rahman, Indonesia)		√				
5	To develop or building of micro hydro power plant, what is very importance to consider beside the Technical part (Syvang Xayyavong, Lao PDR)		√				
6	Hydro analogical data (waterflow, catchment area) and head for generating expected kilowatts. Turbine and electromechanical by technology by Indonesia (Azhaili Baharun, Malaysia)	√					
7	Initial Stage: Feasibility study - Resources - Selection of technology - Impact and effect consideration (Haniff bin Ngadi, Malaysia)	√					
8	This is same as large scale hydro power plant, but want to know how it works (Kyaw Myat Htoo, Myanmar)		√				
9	Micro Hydro Power Plant is based on rainfall season and how to analysis? (Win Tun Lin, Myanmar)	√					
10	The basic steps in developing micro hydro project, from conceptualization, resource assessment, demand evaluation, system			√			

	design, detailed technical design, operation & maintenance, monitoring & repair (Silverio T. Navarro, Jr)						
11	I hope to understand fully project development of hydro & micro hydro (Nur Azha Putra bin Abdul Azim, Singapore)		√				
12	- How to locate resources & hydro power - Power transmission - Safety in wet environment - Energy security in term of continuous power supply (Htet Lin, Singapore)			√			
13	- Engineer - Financial - Social and Economic (Pheeraphong Boonsang, Thailand)		√				
14	Engineering, Financial, Social, Technology about developing hydro power (Suriya Kaewiam, Thailand)			√			
15	What new technology that Indonesia used to build micro hydro plant. Where it from: Transformers, Turbine (Le Thai Anh, Vietnam)					√	
16	- Equipment, control automatic - Transmission line - Manager - Site selection, mechanic selection (Vu Duy Duong, Vietnam)		√				
III	**HOW YOU MAY RELATE THE SUBSTANCES (EITHER POLICY OR TECHNICAL ASPECTS) THAT WILL BE DELIVERED IN THE SESSION TO YOUR COUNTRY'S INTEREST**						
1	Technical study for Mycro Hydro Power, Cost of Material of Micro Hydro (So Veasna, Cambodia)			√			
2	As my country is less experience and awareness in Micro Hydro power Developing. So we need to improve. (Hean Veasna, Cambodia)		√				
3	About social, economic and financial aspect. (Syukri Yunus, Indonesia)		√				
4	Theory and technical aspects are needed to develop the alternative energy for environmental education to the people that visit in our Centre (Syafi'i A. Rahman, Indonesia)		√				
5	Share some experiences of small hydro power development in ASEAN member countries (Syvang Xayyavong, Lao PDR)			√			
6	Successful story of community based MHP in Indonesia in term of managing and monitoring by community (Azhaili Baharun, Malaysia)	√					
7	- Commercial benefits - Community benefits (Haniff bin Ngadi, Malaysia)	√					
8	Both theory and technical aspects are important but technical aspects are preferable (Kyaw Myat Htoo, Myanmar)			√			
9	Different countries have different ways to develop Micro Hydro Power (Win Tun Lin, Myanmar)	√					
10	Our country is already doing micro hydro, but needs support to be sustainable and replicable through understanding best practices od successful implementation of MHP project done in other countries (Silverio T. Navarro, Jr)	√					
11	Singapore has no hydro plans. However, it has a potential to finance		√				

	such projects as a climate change international agenda (Nur Azha Putra bin Abdul Azim, Singapore)						
12	- How to develop community based projects - How to overcome financial constraints in remote communities (Htet Lin, Singapore)			√			
13	Civil & mechanical engineer development for MHP plant (Pheeraphong Boonsang, Thailand)			√			
14	I will get knowledge from this training about finance, social, and technic to develop in hydro power (Suriya Kaewiam, Thailand)			√			
15	Effect environment, Cost of build micro hydro plant, Cultivation forest (Le Thai Anh, Vietnam)	√					
16	Effect environment, technical of turbine, cheap equipment, financial, and other application (Vu Duy Duong, Vietnam)		√				
IV	**POSSIBLE APPLICATION OF KNOWLEDGE AND EXPERIENCES SHARED IN THE SESSION TO YOUR COUNTRY'S RENEWABLE ENERGY PROGRAMME**						
1	Yes because we have Master Plan for development for Renewable Energy (So Veasna, Cambodia)	√					
2	Renewable energy for rural community, good practice Micro Hydro Power in rural communities (Hean Veasna, Cambodia)	√					
3	To know the parameters…make the Plant of Seloliman because successful case of Micro Hydro (Syukri Yunus, Indonesia, Indonesia)	√					
4	It's possible to share experiences about renewable energy (Syafi'i A. Rahman, Indonesia)	√					
5	After this programme, I would report to my colleagues how Indonesia develops micro hydro community based for sustainable, and how ASEAN member countries develop (Syvang Xayyavong, Lao PDR)		√				
6	MHP on ASEAN, the successful of project (Azhaili Baharun, Malaysia)	√					
7	Getting permission to develop the project: The methodology (Haniff bin Ngadi, Malaysia)		√				
8	We need to learn and exploit so many renewable resources in our country (Kyaw Myat Htoo, Myanmar)		√				
9	In ASEAN countries, possible to share (Win Tun Lin, Myanmar)	√					
10	Knowledge acquired in this workshop will be applied in our present project in Mindanao and future projects in the planning stage (Silverio T. Navarro, Jr)	√					
11	Develop bottoms-up social programme to utilize renewable energy (Nur Azha Putra bin Abdul Azim, Singapore)	√					
12	Marine flows/streams energy generation (Htet Lin, Singapore)					√	
13	- Technical engineering of MHP - Financial aspect of MHP (Pheeraphong Boonsang, Thailand)	√					
14	Technical financial & social knowledge to develop MHP (Suriya Kaewiam, Thailand)		√				
15	After training I will share knowledge and experiences to VEEA's member via email, website. Sending copy document to companies that want to invest micro hydro plant (Le Thai Anh, Vietnam)	√					
16	Flood alert, repair equipment, old construction (Vu Duy Duong,		√				

	Vietnam)						
V	**OTHER EXPECTATIONS**						
1	I hope this training good for all participants, exchange the experience, to improve knowledge for developing Micro Hydro Power Plant for rural area. (So Veasna, Cambodia)	√					
2	I am hoping the participants still can communicate to each other after this training. (Syukri Yunus, Indonesia)	√					
3	After training I am still hoping there is networking for the participants to each other (Syafi'i A. Rahman, Indonesia)	√					
4	One more to make micro hydro communities based for sustainable, I would like to know how to make the high profit from small micro hydro power development (Syvang Xayyavong, Lao PDR)	√					
5	- R&D has been develop on the technology - Incentive provided by government, financial institution and private sector (Haniff bin Ngadi, Malaysia)						√
6	Other renewable energy like: wind, solar, tidal, bio-mass technologies are there and I would like to take some training programme specificly (Kyaw Myat Htoo, Myanmar)					√	
7	For Micro Hydro Power, how about causes for all (i.e. turbine, generator and for power line (Win Tun Lin, Myanmar)					√	
8	My expectation is to learn the basic steps in developing micro hydro project: - To learn the regulatory and policy issues from other countries and how they can help accelerate the development of MHP - To know the social aspects in the experience of developing MHP projects with local communities and the response of the utilities to the project - To understand the successful financial models and financial design of MHP project that can be bankable and commercially replicable - To link with manufacturer of electro mechanical equipment and MHP design and consulting firm that can be tapped in developing MHP projects and help support the project during implementation and operation (Silverio T. Navarro, Jr)			√			
9	See it there is a common renewable energy policy & development agenda emerging across the ASEAN states (Nur Azha Putra bin Abdul Azim, Singapore)		√				
10	Field trips to real remote communities to learn how they utilize micro hydro power (Htet Lin, Singapore)	√					
11	I will receive knowledge and experiences shared in this programme and bring it to improve and develop technical engineering of MHP (Pheeraphong Boonsang, Thailand)		√				
12	I will know participant from others country (Suriya Kaewiam, Thailand)	√					
Total		**25**	**32**	**11**	**2**	**4**	**2**
		68			**8**		
Percentage		**89**			**11**		

Based on the percentage of met expectations (89%), we may conclude that the participants are satisfied with the training programmes they participated.

[*As a reference, the scoring range is classified as follows: 81-100% met is Satisfied; 51-80% met is Good; 26-50% met is Sufficient; and 0-25% met is Failed*]

2. Summary of Evaluation by Training Subjects:

Participants were requested to fill up the Evaluation by Subject/Field Form right after the related subject/field was finished. The tabulation result of the filled up questionnaires shows the conclusion as follows:

No	a1	a2	b1	b2	b3	**Score**	**Relevance**	**Efficiency**	**Resource Person**
1	4,4	4,2	4,3	4,6	4,4	**4,4**	**4,3**	**4,4**	Makarim Wibisono
2	4,1	4,2	4,2	4,2	4,4	**4,2**	**4,2**	**4,3**	Kusetiadi Raharjo
3	4,1	4,2	4,2	4,3	4,0	**4,2**	**4,2**	**4,1**	Priyono Sutikno
4	4,3	4,3	4,2	4,6	4,2	**4,3**	**4,3**	**4,3**	Chayun Budiono
5	4,1	3,9	3,9	4,0	4,1	**4,0**	**4,0**	**4,0**	Kusetiadi Raharjo
6	4,5	4,4	4,3	4,5	4,2	**4,4**	**4,5**	**4,3**	Amalia Suryani
7	3,9	3,9	4,0	4,1	4,1	**4,0**	**3,9**	**4,1**	Salman N Bachtiar
8	4,3	4,1	4,0	3,9	4,1	**4,1**	**4,2**	**4,0**	Agus Maryono
9	4,4	4,4	4,3	4,6	4,1	**4,4**	**4,4**	**4,3**	Suroso
10	4,7	4,6	4,2	4,6	4,6	**4,5**	**4,6**	**4,5**	Field Study
	4,08	**4,03**	**4,08**	**4,26**	**4,02**	**4,09**	**4,06**	**4,12**	Average

The score range is from 1 to 5. [1=strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree]. If the average score of all training subjects is closer to 5, it means that all subjects delivered in the Class and Field Sessions are well understood by the participants and most appropriate for them. Based on the average of scores described above, the evaluation result is good.

As reference, following is the number of subjects evaluated (left coloumn of the above table):

1. Towards ASEAN Community
2. Basic Knowledge of Micro Hydro Power
3. Technical Engineering of Micro Hydro Power
4. Financial Aspect of Micro Hydro Power
5. Social and Economic Aspects of Micro Hydro Power
6. Productive Use of Energy
7. Community Development
8. Sustainability Aspect of Micro Hydro Power
9. Successful Case of Micro Hydro Power Plant of Seloliman
10. Field Study to Micro Hydro Power Plants of Kalimaron and Wot Lemah

[a1=level of understanding; a2=level of application; b1=training materiall; b2=professionalism of resource person; b3=time given; a1+a2=relevance; b1+b2+b3=efficiency].

The ranging figures are from 1 to 5. If the average score of all training subjects is closer to 5, it means that all subjects delivered in the Class and Field Sessions are well understood by the participants and most appropriate for them.

3. Result of Overall Evaluation:

Participants were requested to fill up the Overall Evaluation Form on the last session. The tabulation results of the filled up questionnaires show the conclusion as follows:

(*See tabulation results on the following pages*).

1. On General Information:
   - Sector which participants work: Government Ministry of Energy (62,50%)
   - How participants heard about this course: Colleague (62,50%)

2. On Pre-Event Information:
   - Information circulated before the course: Mostly useful (50%)
   - Information circulated before the course: Mostly accurate (50%)

3. On Rating of the Course's Objectives:
   - Clarity of objective in the context of MHP development: Completely clear (50%)
   - Relevance of objective to the needs: Mostly relevant (62,50%)
   - Success to what certain extent to meet the needs: Mostly met (62,50%)
   - Clarity of objective in the context of workability of MHP development: Mostly clear (56,25%)
   - Relevance of objective to the needs: Mostly relevant (68,75%)
   - Success to what certain extent to mee the needs: Mostly met (62,50%)
   - Clarity of objective in the context of improving skills on each subject: Completely clear (50%)
   - Relevance of objective to the needs: Mostly relevant (56,25%)
   - Success to what certain extent to meet the needs: Mostly met (56,25%)
   - Clarity of objective of all MHP aspects shared: Completely clear (50%)
   - Relevance of objective to the needs: Mostly relevant (75%)
   - Success to what certain extent to meet the needs: Mostly met (62,50%)

4. On Value of the Training:
   - Information presented was new: Agree (62,50%)
   - Content is relevant to job and will use it: Agree (56,25%)
   - Training material was relevant: Agree (75%)

5. On Methodology:
   - Effectiveness: Mostly effective (68,75%)
   - Appropriateness: Mostly appropriate (75%)

6. On Organization and Logistics:
   - The course was well organized: Agree (62,50%)
   - The facilities were good: Agree (68,75%)

7. Overall Satisfaction:
   - Satisfaction with the course: Mostly satisfied (68,75%)
   - Value and relevance: Good (68,75%)
   - Duration of one week course: Not sure (68,75%)
   - To recommend this course to others: Yes (100%)

	1	General Information											
	1								2				
RESPONDENT	1	2	3	4	5	6	7	8	1	2	3	4	5
1	1												1
2		1							1				
3	1								1				
4	1								1				
5	1								1				
6	1								1				
7	1												1
8		1							1				
9			1						1				
10	1								1				
11	1									1			
12	1												1
13			1										1
14		1											1
15		1							1				
16	1								1				
	62,50%	25%	12,50%	0%	0%	0%	0%	0%	62,50%	6,25%	0%	0%	31,25%
	100%								100%				

	2	Pre-event information						
	1				2			
RESPONDENT	1	2	3	4	1	2	3	4
1		1				1		
2		1				1		
3			1				1	
4		1				1		
5		1				1		
6	1				1			
7		1				1		
8		1				1		
9	1				1			
10	1				1			
11	1				1			
12			1				1	
13	1				1			
14	1				1			
15		1				1		
16		1				1		
	37,50%	50,00%	12,50%	0%	37,50%	50,00%	12,50%	0%
	100%				100%			

	3 Objectives																																											
	1												2												3												4							
	1				2				3				1				2				3				1				2				3				1				2				3			
RESPONDENT	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	1				1					1			1				1					1			1				1				1					1				1				1		
2		1			1					1				1			1					1				1				1					1				1				1				1		
3		1				1				1				1					1			1				1				1					1				1				1				1		
4	1				1				1				1				1				1				1				1				1					1				1				1		
5		1			1				1				1					1				1					1			1					1				1				1				1		
6		1				1				1				1				1				1				1				1					1				1				1				1		
7		1				1				1				1				1				1				1				1					1				1				1				1		
8			1			1				1				1				1			1					1					1		1		1				1				1				1		
9	1					1			1				1					1			1				1				1					1				1				1				1		
10	1					1			1				1					1			1				1						1		1		1				1				1				1		
11	1				1				1				1				1				1				1				1				1					1				1				1		
12	1					1				1					1			1					1				1				1					1				1				1				1		
13	1				1				1					1				1				1			1				1				1					1				1				1		
14		1				1				1				1				1				1				1				1					1				1				1				1		
15		1				1				1				1				1				1			1				1				1					1				1				1		
16	1					1				1				1				1				1			1				1				1					1				1				1		
	50%	43,75%	6,25%	0%	37,5%	62,5%	0%	0%	37,5%	62,5%	0%	0%	37,50%	56,25%	6,25%	0%	25%	68,75%	6,25%	0%	31,25%	62,50%	6,25%	0%	50%	37,5%	12,5%	0%	31,25%	56,25%	12,5%	0%	43,75%	56,25%	0%	0%	43,75%	50%	6,25%	0%	25%	75%	0%	0%	31,25%	62,5%	6,25%	0%
	100%				100%				100%				100%				100%				100%				100%				100%				100%				100%				100%				100%			

	4	Value of the training									
	1			2			3			4	5
RESPONDENT	1	2	3	1	2	3	1	2	3		
1		1		1				1			
2		1		1				1			
3		1			1			1			
4		1			1			1			
5		1		1				1			
6		1			1			1			
7	1				1			1			
8		1			1			1			
9		1			1		1				
10		1			1		1				
11	1			1			1				
12	1			1				1			
13			1		1			1			
14	1				1		1				
15		1		1				1			
16	1			1				1			
	31,25%	62,5%	6,25%	43,75%	56,25%	0%	25%	75%	0%	0%	0%
	100%			100%			100%				

	5	Methodology						
	1				2			
RESPONDENT	1	2	3	4	1	2	3	4
1		1				1		
2		1				1		
3			1			1		
4		1				1		
5		1				1		
6		1				1		
7		1				1		
8			1				1	
9	1				1			
10		1				1		
11	1				1			
12		1				1		
13		1				1		
14		1				1		
15	1				1			
16		1				1		
	18,75%	68,75%	12,5%	0%	18,75%	75%	6,25%	0%
	100%				100%			

	6	Organization and Logisticc						
	1				2			
RESPONDENT	1	2	3	4	1	2	3	4
1	1				1			
2		1					1	
3		1				1		
4		1				1		
5		1				1		
6	1				1			
7		1				1		
8		1				1		
9	1				1			
10	1					1		
11	1				1			
12		1				1		
13			1			1		
14		1				1		
15		1				1		
16		1				1		
	31,25%	62,5%	6,25%	0%	25%	68,75%	6,25%	0%
	100%				100%			

	7 Overall Satisfaction													
	1				2				3			4		
RESPONDENT	1	2	3	4	1	2	3	4	1	2	3	1	2	3
1	1				1					1		1		
2		1			1					1		1		
3		1				1				1		1		
4		1				1			1			1		
5		1				1				1		1		
6		1			1					1		1		
7		1				1				1		1		
8		1				1				1		1		
9	1				1					1		1		
10	1					1			1			1		
11	1				1				1			1		
12		1				1			1			1		
13	1					1				1		1		
14		1				1				1		1		
15		1				1				1		1		
16		1				1			1			1		
	31,25%	68,75%	0%	0%	31,25%	68,75%	0%	0%	31,25%	68,75%	0%	100%	0%	0%
	100%				100%				100%			100%		

Future Collaboration Post Training

No	Proposed Activity	Subject	Proposed Venue	Remarks
1	Focused Training on Micro Hydro Power (MHP)	- Turbine manufacturing - Feasibility Study of MHP - Design and engineering	Any city in Indonesia	Need implementing institution
2	Visiting Turbine Factory in Indonesia	- Field assessment to import turbine from Indonesia - Technical assistance	Bandung, Indonesia	- Arrange business meeting in Bandung - Prepare TOR on Technology Transfer
3	Regional Conference on Renewable Energy	Sharing of experiences on policy, regulation and technical knowhow of MHP	Sarawak, Malaysia	Need participation of ASEAN member countries
4	Research and Development on Renewable Energy Technology, (including Research on MHP Turbine)	To improve the existing applied appropriate technology for better efficiency, performande and local manufcaturing capabilities.	Nanyang Technical University, Singapore	Need implementing institution

VIII. Conclusion and Recommendation

Following is the conclusion and recommendation for further anticipation:

The overall implementation of the training programme on renewable energy: community-based micro hydro power development for ASEAN states has been well implemented, both substantially and logistically.

However, there are some feedbacks from the participants expressed during the overall evaluation that could be accommodated in future similar training, as follows:

1. Despite the training subjects have been considered appropriate, it could be enriched with supporting references from other countries that have similar cases.
2. Tehnical exercises at fieldsite might be added with other instruments which are not complicated.
3. Since the field study is not merely on technical matters, it is suggested to extend more days at feldsite to observe and practise relevant field works related to social and economic benefits.

There is also strong recommendation to conduct another similar training with considering the feedbacks from participants. In this regard, NAM CSSTC and the Ministry of Energy and Mineral Resources instantly identify another best practice of community-based microhydro prower development that also generates value added to local communty. Potential plants are located in West Sumatera, South Sulawesi and Lombok. These three sites should assessed at field level before they are selected.

IX. Selected Photos

Welcoming Remarks by H.E. Ambassador Linggawaty Hakim,
Director of NAM CSSTC

Remarks by H.E. Ambassador Dr. Makarim Wibisono,
Executive Director of ASEAN Foundation

Opening Remarks by Ronggo Kuncahyo
Senior Assistant to the Minister of Energy and Mineral Resources of Indonesia

Sitting (Left to Right): Munir Ahmad (MoEMR of Indonesia), Ronggo Kuncahyo (MoEMR of Indonesia), Linggawaty Hakim (MoFA of Indonesia/NAM CSSTC), Makarim Wibisono (ASEAN Foundation), Achmad Rofi'ie (NAM CSSTC)
Standing (Left to Right): Syvang Xayyavong (Lao PDR), Htet LIN (Singapore), Nur Azha Putra Bin Abdul Azim (Singapore), Suriya Kaewiam (Thailand), Pheeraphong Boonsang (Thailand), Win Tun Lin (Myanmar), Vu Duy Duong (Vietnam), Le Thai Anh (Vietnam), Silverio T. Navarro, Jr. (The Philippines), Syukri Yunus (Indonesia), Safi'i A. Rachman (Indonesia), Suroso (Resource Person), Chayun Budiono (Resource Person), Hean Veasna (Cambodia), Kusetiadi Raharjo (Resource Person), So Veasna (Cambodia), Kyaw Myat Htoo (Myanmar), Azhaili Bin Baharun (Malaysia), Priyono Sutikno (Resource Person), Haniff Bin Ngadi (Malaysia)

Group photo of participants and the VIP guests

Class Session at the Midtown Hotel, Surabaya


Field Session at MHP Plant in Seloliman, Mojokerto District

River that is used as source of energy

Checking the waterways

Power House of MHP Kalimaron

Turbine made in Indonesia in the Power House

Group photo at the fieldsite

Visiting consumer who productively uses electricity supplied by MHP Seloliman

Preparation of Action Plan

Presentation of Action Plan

Participants' representative delivering Vote of Thanks to the Training Committee on the Closing Session

Remarks by Representative of the Ministry of Energy and Mineral Resources on the Closing Session

Certificate Awarding on the Closing Session

Closing Remarks by Representative of NAM CSSTC on the Closing Session