



Contributing to poverty Alleviation through Regional Energy Planning in Indonesia

# **Contributing to poverty Alleviation through Regional Energy Planning in Indonesia (CAREPI)**

Deliverable No. 12: Summary Report on identified  
capacity development needs and work plan for the  
implementation of the activities

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## Acknowledgement/Preface

This report is deliverable No. 12 of the COOPENER project 'Contributing to poverty Alleviation through Regional Energy Planning in Indonesia (CAREPI)'. The CAREPI project aims to develop institutional and technical capacity in selected regions in Indonesia for conducting energy policy analysis and providing improved energy services to poor communities, in order to alleviate poverty and contribute to sustainable development.

The CAREPI project is partly funded the European Commission and implemented by the Energy research Centre of the Netherlands (ECN) together with Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ) GmbH, Germany, Entec Consultancy & Engineering, Switzerland, and five organisations from Indonesia: Data and Information centre of the Ministry of Energy and Mineral Resources (DICEMR), Institute for Research and Community Empowerment of the Institute of Technology of Bandung (ITB), Center for Regional Energy Management (PUSPER) of the Muhammadiyah University of Yogyakarta, Electric Engineering Department, University of Sumatra Utara and the University of Mataram. The project is registered under ECN project number 77804.

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## Abstract

This report presents a description of the capacity development activities that have been conducted during the first nine months of the CAREPI project and gives an overview of the identified capacity development needs for the remaining duration of the project.

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# 1. Introduction

The capacity development needs of many stakeholders in the four regions targeted by CAREPI will be addressed as part of Work Package 5. The training activities carried out in WP 5 are needed to enable the selected region to formulate sound regional energy strategies that incorporate energy & poverty aspects. In this report an overview is presented of the identified capacity building needs, the envisaged training activities that address these needs and reports are presented of the capacity building activities already completed.

WP 5 relates to several other WPs in the CAREPI project (see also the project concept outline below). The main areas in which capacity development is needed are:

- institutionalising of the Regional Energy Forum (REF)
- establishment and training of the Regional Technical Team (RTT)
- identification of energy related needs and priorities of poor communities.

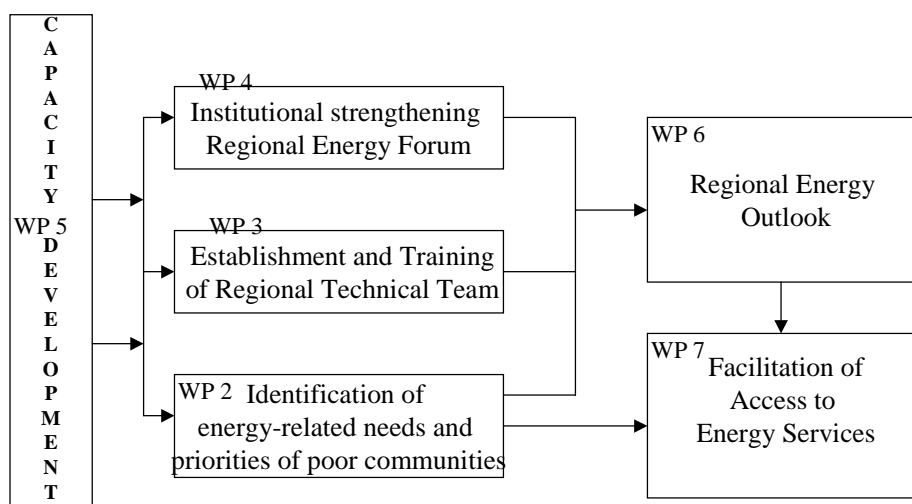
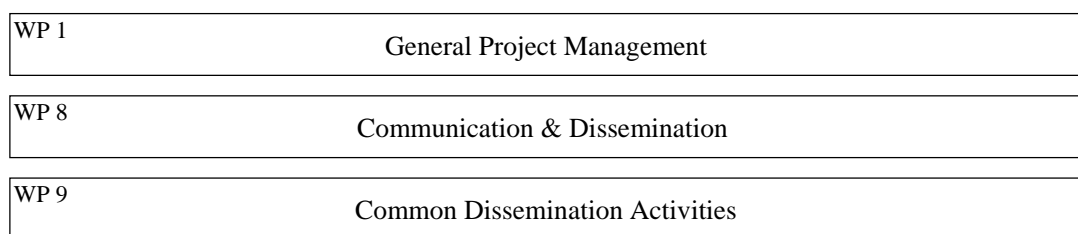


Figure 1.1 *Schematic representation of the CAREPI project structure*

Of these areas, the second one, the setting up and training of the technical teams is considered to be the largest effort. Their role in the whole project as supporting and implementing team is also quite considerable. Their tasks relate to assessment of energy and energy related data, the establishment of a working analytical tool (LEAP database and model), the support of the REF by quantitative scenario results, the preparation and implementation of feasibility studies for the micro-hydro projects and support of these projects' implementation.

This report describes first the capacity needs of the different work packages identified for the project (Chapter 2). The second part (Chapter 3) describes the activities that have been undertaken in 2007 to enhance capacity in the mentioned fields.

## 2. Identification of capacity building needs in the selected regions

### 2.1 Capacity needs related to WP 2

This work package has received somewhat less attention than the other two, which is obvious since the bulk of the work for WP3 and WP7 falls early in the whole duration of the project. Nevertheless, a survey was held during the August 2007 project team meetings in order to list the required capacity needs in the technical teams and the regions.

All teams acknowledged that they do not have a large experience regarding the identification of energy related needs of poor communities. In particular they would welcome support, guidance and methodologies in order to:

- Select an appropriate community
- Establish energy-related priorities of poor communities who are not connected to the grid
- Identify 'best practices' for provision of energy services
- Formulate policies to improve access to modern energy for poor people

As possible steps to establish a working relationship with community and local energy service providers the following tentative proposal was suggested in order to increase local involvement and collaboration:

- Present the CAREPI project
- Explain the reasons for conducting a workshop/survey/interview
- Explain importance of local participation in developing policies to improve access to modern energy

### 2.2 Capacity needs related to WP 3

During the preparation of the project and at the kick-off meeting held in November 2006 in Jakarta, the identification of needs and priorities for capacity development activities for the regional technical team - as focal points in each region - took place.

It became clear that the RTTs would need support and guidance on:

- setting up the regional teams (staffing)
- data collection :
  - identifying which energy and energy related data was required for the establishment of a regional energy profile;
  - identifying sources for such data;
  - methodology to structure, assess, interpret and complement these data;
- developing energy modelling tool:
  - the setting up and use of such a tool (LEAP model);
  - the conversion of the collected data into the tool's format;
  - running base case scenario with the tool;
  - analysis of the results;
  - translation scenario outcomes into policy relevant messages.
- integration into the regional energy policy framework.

For each of these issues, the necessary actions were taken and planned. For the establishment of the regional teams, experience of existing teams at regional universities (e.g. Mataram) was shared with relative new teams. This process went smoothly and by the time the opening seminars took place, all teams were up and running.

## 2.3 Capacity needs related to WP 4

WP 4 aims at the establishment and institutional strengthening of the regional energy forums. During the inception phase the energy forums in Central Java, Yogyakarta and West Nusa Tenggara are formally established. A proposal for the establishment of the energy forum in North Sumatra was submitted to the regional government but has not yet been approved pending the outcome of the current discussion on the precise composition of the forum.

To strengthen the regional energy forums, several meetings and workshops will be arranged to discuss the medium and long term objectives of the energy sector in the region and to identify and evaluate policy measures that can be used to achieve these objectives. The various policy scenarios developed by the technical teams will form the starting point for these discussions.

Concrete capacity building needs have been identified only to a limited extent because WP 4 has not yet started. However, first discussions with some members of the newly established energy forums indicate that there certainly is a need for training courses on national and regional energy planning and on the development of regional energy strategies. In addition, there is insufficient capacity in the regions to develop concrete energy supply projects and identify and attract potential investors in energy supply infrastructure.

## 2.4 Capacity needs related to WP 6

WP6 has as target the development of a regional energy outlook and the formulation of a pro-poor strategy. As such it is the condensation of the work done in WP3, WP4 and WP2 respectively into a final report. However it covers more than just retrieving information from other WPs within CAREPI. The discussions within the REF with support of the RTT is a new process in most of the regions and as such it will involve a learning by doing process for most participants. This process needs guidance and support from the national government in order to streamline the course of these discussions and the required as well as the resulting interactions between the REF and RTT and other stakeholders.

Further support will be provided when writing the regional energy outlook, especially on the use and interpretation of the scenario analyses as support for energy policy formulation and during the formulation of the pro-poor strategies.

Capacity building has not started yet for this WP since it is scheduled only to start in month 18 of the project (June 2008). However preparatory work is being done by convening the RTT and REF during project meetings or during regional meetings and discussions on regional energy planning and policy.

## 2.5 Capacity needs related to WP 7

Parallel to the capacity development regarding energy data and analysis, the RTTs also needed to develop their capacity in the domain of access to modern energy for local and poor communities. In the CAREPI project, this is scheduled to be executed by the study and possible implementation of micro-hydro projects.

A thorough introduction to the matter during the kick-off meeting in November 2006 by GTZ and the provision of useful material (standardised survey forms to assess the local situation and feasibility of micro hydro, in English and in Bahasa Indonesia) made it possible that by the time of the opening seminars, the RTTs had already short listed a number of sites in their region for which prospects looked favourable. During the setting up of the short list and the site visits (some of) the teams made, it became clear that further support and training by GTZ was re-

quired. Moreover, since the RTTs are located at universities, their knowledge is more of an academic kind than of an implementation kind. This part of the CAREPI project - which is focused towards local energy markets - caused a number of questions during the inception phase of the project.

A programme to cope with these questions and to enhance knowledge and capacity at the RTTs, similar to the training and coaching programme made by ITB, was elaborated by GTZ.

In 2007 the technical teams will work on selection and evaluation of potential sites for mini-hydro projects. This will result in the realization of actual energy projects providing a tangible contribution to improved access to reliable energy services.

The training planned to be conducted under WP 7 aims to develop and enhance local capacity in the field of MHP project identification, assessment and preparation.

### 3. Capacity enhancement

In order to satisfy the above identified capacity building needs, a number of activities have been planned and started already in 2007.

#### 3.1 Capacity enhancement related to WP2

For this work package, no formal training or support activity has been undertaken in 2007. During the August team meetings, it was agreed that the teams would do a survey about existing information sources or methodologies regarding the identification of energy related needs of poor communities for their region and to reflect on a suitable methodology and workplan.

It was suggested by ECN to gather as much as possible information on:

- Selection of an appropriate target location(s)
- Assessment of current energy use
- Identification of energy needs and priorities
- Identification of ‘best practices’: successful initiatives by end users, energy companies and service suppliers that improve provision of modern energy
- Formulation of ‘pro-poor’ strategy that addresses the identified energy priorities

The training/capacity building needs that have been identified so far include:

- Developing and implementing a (small) energy household survey. This includes drawing up a questionnaire, sampling techniques and processing and analysing the results.
- International experience with best energy practices that address the energy needs of poor people
- Formulation of pro-poor energy strategies

Most training will be provided on-the-job. In addition, specific training courses will be given if the need arises. At the joint November 2007 team meeting session, a more detailed plan of capacity development, including methodological issues, for this work package will be discussed among all regional teams.

#### 3.2 Capacity enhancement related to WP3

The integration in the regional energy policy framework was started at the openings seminars where all stakeholders were present. Most regional teams are now accredited by the regional authorities and have established good connections with the regional energy office and the regional planning office (BAPPEDA).

The energy data collection and energy modelling needs were taken care of by ITB following an extensive training and coaching programme (see annex A). Between 9 and 26 April 2007, each of the regional teams received a training on regional energy profile and regional energy planning. The trainings sessions were set up similarly for all teams and consisted of the following:

Table 3.1 *Programme for training session on energy planning and LEAP model*

Day	Substance	Format
1	a. Introduction to Energy Planning	Lecture and Discussion
	b. Energy Database and Energy Balance	
2 and 3	Energy Planning Modelling with LEAP	Hands-on Practice on Computer

For this training, the following materials, in translated into Bahasa Indonesia versions, were made available to the participants:

- Book of "Energy Planning & Energy Profile"
- Book of "Guidance to Energy Planning with LEAP"
- CD of "Guidance to Energy Planning with LEAP"

These sessions were attended by all members of the technical teams, which also comprise local governmental officers from e.g. the regional energy and regional planning office. Attendance varied between 20 and 55 persons per session and ITB provided the trainings and training material.

For the remaining duration of the project, training activities are planned in the first half of 2008, comprising specific lectures on integrated energy planning with a focus on scenario development and on-the-job training, to enable the regional teams to produce the regional energy outlook. Finally, in 2009 training is envisaged with a particular focus on implementation aspects of the regional energy strategy.

### 3.3 Capacity enhancement related to WP7

The training approach and basic contents for the micro hydro project implementation was identical for all four regional training programs. Training was conducted in the classroom as theoretical lessons (presentations and analyses), complemented with a one day practical on-site session where practical application of the survey and data collection techniques was practiced. This was carried out at the pre-selected site locations.

The training took three to four days at each university and covered the following items:

- Day 1: Classroom Session: Feasibility of a Mini Hydropower Project
  - factors influencing the feasibility of a project
  - site assessment: survey and data collection
  - initial design (feasibility level)
  - cost estimating
  - economic and financial analysis
- Day 2 (+ Day 3, if required due to difficult access to the site):  
Site Assessments at the pre-Selected Sites  
(detailed field work supported by theoretical sessions)
  - selection of suitable location for MHP components
  - flow measurements
  - head measurements
  - topographic survey
  - socio-economic data collection
  - GPS survey of the proposed distribution network
- Day 3 (Day 4, if two days in the field):  
Classroom Session: Analysis of Field Data & Initial preparation of the pre-/Feasibility Studies

Training in the field in order to perform site assessments and data collection usually took one full day, however, two days were allocated for the field training in North Sumatra and in Lombok due to the length of travel required to reach the site.

The following items were covered during these field trainings:

- **Reconnaissance of the site** and selection of suitable locations for the individual components of the scheme, discussion of possible alternative configurations
- **Flow measurements**, using a current meter (propeller) and a conductivity meter (salt dilution method)
- **Head measurements**, using various types of levels, altimeter, GPS and clinometer.
- **Topographic survey** (theoretical introduction)

- **Socio-economic data collection**
- **GPS survey** of the future distribution network

The training sessions were attended by 12 to 20 persons, both from the universities and from regional offices. The session took place between 30 April and 24 May 2007, preceded by a less formal pre-session support and coaching during the early months of 2007. An extensive training session report, including all training material is available through GTZ and Entec.



*Training session for WP3*



*Field trip during training session for WP7*

Figure 3.1 *Impression of the training sessions and field trips carried out as part of WP 5*

Further on-the-job training is envisaged in 2008 focussing on the construction and operation of micro hydro plants. A second training course is planned for 2009 which will focus more on the technological aspects of the micro hydro projects developed in the four regions.

### 3.4 Planning of capacity building activities

Table 3.2 presents the planning of the capacity building activities identified during the inception phase for WP3,4,6 & 7.



## Appendix A Report on training courses on regional energy profile and regional energy planning

### I. MATARAM

#### 1. Date and Place

Date : 9 – 11 April 2007  
Place : Meeting Room of Engineering Faculty - UNRAM  
Jl. Majapahit No 62, Mataram  
West Nusa Tenggara

#### 2. Participant

The training was attended by 35 participants, that consist of:

- CAREPI Team of NTB (West Nusa Tenggara)
- Energy Office of NTB Province
- Energy Offices of City/Regencies in NTB
- Planning Office of NTB Province
- Trade and Industry Office of NTB Province
- Transportation Office of NTB Province
- Statistics Office of NTB Province
- Lecturers of UNRAM
- Students of UNRAM

List of participant is attached.

#### 3. Schedule and Training Format

Day	Substance	Format
I	c. Introduction to Energy Planning d. Energy Database and Energy Balance	Lecture and Discussion
II dan III	Energy Planning Modeling with LEAP	Practising in Computer

#### 4. Kit for Participant

Kit for Participant consists of:

- a. Book of "Energy Planning & Energy Profile"
- b. Book of "Guidance to Energy Planning with LEAP"
- c. CD of "Guidance to Energy Planning with LEAP"

## I. MEDAN

### 1. Date and Place

Date : 17 – 19 April 2007  
Place : Meeting Room of Electrical Engineering Department - USU  
Jl. Almamater, Padang Bulan, Medan  
North Sumatera

### 2. Participant

The training was attended by 20 participants, that consist of:

- CAREPI Team of North Sumatera (Sumut)
- Energy Office of Sumut Province
- Energy Office of Medan City
- Planning Office of Sumut Province
- Trade and Industry Office of Sumut Province
- Transportation Office of Sumut Province
- Lecturers of USU (North Sumatera University)
- Students of USU

List of participant is attached.

### 3. Schedule and Training Format

Day	Substance	Format
I	e. Introduction to Energy Planning f. Energy Database and Energy Balance	Lecture and Discussion
II dan III	Energy Planning Modeling with LEAP	Practising in Computer

### 4. Kit for Participant

Kit for Participant consists of:

- d. Book of "Energy Planning & Energy Profile"
- e. Book of "Guidance to Energy Planning with LEAP"
- f. CD of "Guidance to Energy Planning with LEAP"

## I. SEMARANG

### 1. Date and Place

Date : 23 – 25 April 2007  
Place : Insitute for Quality Assurance of Education – Central Jawa  
Jalan Kyai Mojo, Semarang  
Central Jawa

### 2. Participant

The training was attended by 55 participants, that consist of:

- CAREPI Team of Central Jawa (Jateng)
- CAREPI Team of DI Yogyakarta (DIY)
- Energy Office of Jateng Province
- PLN Region Jateng - DIY
- Pertamina – Marketing Unit of Jateng - DIY
- Energy Office/Environment Office/Planning Office/Trade and Industry Office/Economy Bureau of Cities/Regencies in Jateng (35 Cities and Regencies)
- Lecturers of UNDIP

List of participant is attached.

### 3. Schedule and Training Format

Day	Substance	Format
I	g. Introduction to Energy Planning h. Energy Database and Energy Balance	Lecture and Discussion
II dan III	Energy Planning Modeling with LEAP	Practising in Computer

### 4. Kit for Participant

Kit for Participant consist of:

- g. Book of "Energy Planning and Energy Profile"
- h. Book of "Guidance to Energy Planning with LEAP"
- i. CD of " Guidance to Energy Planning with LEAP"

## I. YOGYAKARTA

### 1. Date and Place

Date : 26 – 28 April 2007  
Place : a. Meeting Room of Engineering Faculty - UMY  
b. Lab of Computer - UMY  
Jl. Lingkar Barat

Yogyakarta

## 2. Participant

The training was attended by 20 participants, that consist of:

- CAREPI Team of DI Yogyakarta (DIY)
- Energy Office of DIY Province
- Energy Office of Yogyakarta City
- Energy Office of Sleman Regency
- Energy Office of Gunung Kidul Regency
- Energy Office of Bantul Regency
- Energy Office of Kulonprogo Regency
- Lecturers of UMY
- Students of UMY

List of participant is attached.

## 3. Schedule and Training Format

Day	Substance	Format
I	i. Introduction to Energy Planning j. Energy Database and Energy Balance	Lecture and Discussion
II dan III	Energy Planning Modeling with LEAP	Practising in Computer

## 4. Kit for Participant

Kit for Participant consists of:

- j. Book of "Energy Planning & Energy Profile"
- k. Book of "Guidance to Energy Planning with LEAP"
- l. CD of "Guidance to Energy Planning with LEAP"



Picture of Training in Mataram



Picture of Training in Medan



Picture of Training in Semarang



Picture of Training in Yogyakarta

Appendix B Report on the training of local experts on the  
identification, evaluation and development of concrete  
micro hydro projects