

ASEAN Hydropower Competence Centre

HYCOM

Learning

Know-how

Implementation



THE PARTNERS

IMPLEMENTING PARTNERS



Technical Education Development Centre Bandung (TEDC)

The Indonesian TEDC is a country-wide organisation that certifies students on behalf of the Indonesian government and offers high standard vocational training for teachers, trainers and employees. TEDC made available the premises where the HYCOM building has been constructed, develops suitable training curricula in cooperation with PT Entec Indonesia, implements training courses and is responsible for the overall operation, maintenance and management of the facility.



PT Entec Indonesia

PT Entec Indonesia is an Indonesian based consulting and engineering company with a long track-record in developing small-scale hydropower schemes and providing training in the MHP sector. PT Entec Indonesia acquired the HYCOM laboratory equipment, was responsible for the engineering and construction of the laboratory, provides training on operation and maintenance of the facility for the staff of HYCOM and TEDC, and assists TEDC in the development of the training curricula.

SUPPORTING PARTNERS



ASEAN Centre for Energy (ACE)

The ACE is an intergovernmental organisation of the 10 ASEAN member states, that envisions to be a catalyst for the economic growth and development of the ASEAN region by initiating, coordinating and facilitating regional activities on energy. ACE promotes HYCOM and its services regionally in the framework of the Renewable Energy Support Programme for ASEAN (ASEAN-RESP). Furthermore ACE is a member of the HYCOM Steering Committee.



Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

GIZ is a German federal enterprise in the field of international cooperation, sustainable development and international education work around the globe. In the framework of the Renewable Energy Support Programme for ASEAN (ASEAN-RESP) GIZ supported the establishment and setup of the HYCOM facility. GIZ gives input on HYCOM marketing and networking and advises the implementing partners as a member of the HYCOM Steering Committee.



Renewable Energy & Energy Efficiency Promotion in International Cooperation (REPIC)

The REPIC Platform contributes to the creation of a coherent policy and strategy in Switzerland, for the promotion of renewable energy and energy efficiency in international cooperation. The equipment for the HYCOM facility, originating from the University Zürich, was dismantled in Switzerland and shipped to Indonesia with the support of REPIC.

THE HYCOM

The use of hydropower for electricity generation is often the most cost efficient solution to address people's energy needs. In regions with abundant water resources, using hydropower to generate electricity can reduce the dependence on expensive fossil fuels. Especially in developing countries and emerging economies, small-scale hydropower solutions have proven to be important for the electrification and development of remote and rural areas. Nevertheless, to date, the significant hydropower potential in such countries is frequently underutilized.

The Indonesia-based *ASEAN Hydropower Competence Centre* (HYCOM) is an international training facility promoting mini hydropower development (<1MW) and dissemination of know-how in the sector.

HYCOM offers high-quality training on all aspects of the development and implementation of mini hydropower (MHP) plants and builds upon a long experience in manufacturing equipment and implementation of MHP schemes in Indonesia. The competence centre was established in the Bandung area (Java, Indonesia) where a number of established turbine and equipment manufacturers founded their businesses.

HYCOM is strategically located on the premises of the Technical Education Development Centre (TEDC) in Bandung. TEDC is well supplied with lecture facilities (educational infrastructure) and accommodation, which is ideal for trainings with groups of 15 up to 20 participants. HYCOM is equipped with a high class Swiss hydraulic laboratory and the building provides sufficient space for groups of visitors and features class and meeting rooms.

The laboratory equipment consists of following items:

- One 11kW Francis turbine which can be converted to a Kaplan turbine. This unit is equipped with a eddy current brake and a control panel.
- One 11kW Pelton turbine equipped with a DC- Generator brake and control panel.
- One 30kW semi axial pump with pressure vessel, motor and control to operate the Francis/Kaplan turbine.
- One 30kW radial centrifugal pump with motor and control panel to operate the Pelton turbine.
- One PC with lab view software to conduct measurements; several instruments required for flow, torque and pressure measurements.
- One seminar room for up 20 participants, one functional room for up to 20 participants.



THE TRAINING

The HYCOM trainings are designed according to the specific needs and demands of hydropower practitioners. Trainings combine a sound theoretical basis with 'real life' experiences in order to increase the practical benefit for the participants.

The trainings are conducted by a team of international and Indonesian MHP experts with more than 15 years experience in providing training and capacity building for MHP practitioners. In addition, HYCOM can draw on a large network of resource persons able to contribute their extensive knowledge to the trainings when required.

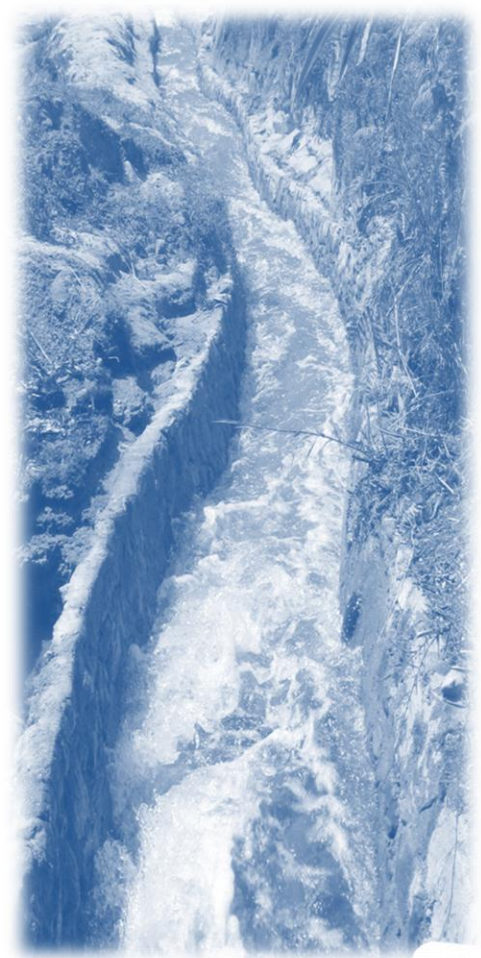
The various training modules offered comprise comprehensive knowledge of and practical exercises on the following topics:

- 01 – Introduction to MHP & Best Practices
- 02 – Management of MHP Projects
- 03 – MHP Project Development
- 04 – Operation and Maintenance of MHP Schemes
- 05 – Site Identification for MHP
- 06 – MHP Feasibility Study
- 07 – Equipment and Turbine Fabrication for MHP

All modules are designed either for a beginner, intermediate or advanced level and can focus on managerial or technical aspects of MHP development.

HYCOM is committed to high-quality capacity development and conducts the trainings as close to the participants' needs as possible. The training modules can therefore be booked either individually or be combined according to the specific training needs. To optimally meet the demands of its customers, all courses can be adjusted on demand. Moreover, HYCOM offers completely *tailor-made trainings* upon request.

In order to ensure a good learning environment, the group size of the trainings is limited, ranging from 3 (minimum) to 12 (maximum) participants. For *tailor-made trainings* or seminars other conditions might apply.



01 Introduction to MHP & Best Practices

COURSE DESCRIPTION: This introductory course on MHP provides a general overview on the most crucial aspects of MHP development and project implementation. It addresses the most important technical, institutional and organizational matters during the implementation and lifetime-cycle of an MHP scheme. This comprises introductory information on site identification and technical project development, community preparation, operation & maintenance and project monitoring.

The course is designed for people without previous experience in the MHP sector and highlights good practices and common mistakes in MHP development.

COURSE CONTENT:

- Introduction to MHP
- Site Identification and Technical Project Development
- Community Mobilisation and Involvement
- Management, Operation & Maintenance
- Monitoring and Evaluation
- Best Practices and Common Mistakes of MHP
- Field Visit

TARGET PARTICIPANTS: Local Government, Educational Institutions, Policy & Decision Makers, Investors & Financers, Development Agencies.

PREREQUISITES: Beginner Level (Managerial)

DURATION: 5 Days (1 Week)

LANGUAGES AVAILABLE: English, Bahasa Indonesia

FEE: On Request

INCLUDED IN THE FEE: Participation in the Training, Training Material, Field Visit

02 Management of MHP Projects

COURSE DESCRIPTION: The ability to manage MHP projects in a sustainable way is key to their success and therefore important for all stakeholders involved. In this course the participants will learn on a managerial level how to manage and administer a MHP plant. This includes important management considerations during the development, construction and setup of a MHP plant on the one hand and the setup of a sustainable management and administration at village level on the other. The course will be completed by an introduction to general technical aspects of MHP construction and operation. This training touches upon administrative, financial and legal aspects and therefore addresses a large target group. For the successful participation a basic knowledge of MHP schemes is advisable.

COURSE CONTENT:

- Principles of MHP
- Role and Task of MHP Management Team
- Introduction to the Operation and Maintenance of MHP
- Project Planning and Financial Feasibility
- Financial Administration
- Economic Aspects of MHP
- Legal Aspects of MHP
- Community Mobilisation and Involvement
- Community-based Management and Administration
- Field Visits

TARGET PARTICIPANTS: Project Developers, Educational Institutions (e.g. Vocational Schools), NGOs, Development Agencies, Trainers (i.e. Train-the-Trainers), Community

PREREQUISITES: Beginner or Intermediate Level (Managerial)

DURATION: 10 Days (2 Weeks)

LANGUAGES AVAILABLE: English, Bahasa Indonesia

FEE: On Request

INCLUDED IN THE FEE: Participation in the Training, Training Material, Field Visits

03 MHP Project Development

COURSE DESCRIPTION: This course offers insights into the most important technical and economic aspects of mini-hydropower technology as well as the construction and development of community based MHP schemes. The course covers the whole MHP project cycle and elaborates on all major aspects of the project development. This includes an introduction to site identification and selection criteria, civil engineering and appropriate turbine technology, generation and electrical equipment. A strong focus lies on sustainability of MHP plants which includes operation and maintenance as well as community-based management and administration.

The content is tailored for practitioners with fair to good prequalifications in MHP development and/or management and combines managerial and technical aspects.

COURSE CONTENT:

- Principles of MHP
- Introduction to Site Identification & Selection criteria
- Project Planning and Financial Feasibility
- MHP Design Drawing
- Civil Engineering of MHP
- Turbine Technology and Performance
- Generation & Electrical Equipment
- Operation and Maintenance of MHP
- Community Mobilisation and Involvement
- Field Visits & Practice

TARGET PARTICIPANTS: Project Developers, Educational Institutions (e.g. Vocational Schools), NGOs, Development Agencies, Trainers (i.e. Train-the-Trainers), Engineers

PREREQUISITES: Intermediate Level (Technical & Managerial)

DURATION: 10 Days (2 Weeks)

LANGUAGES AVAILABLE: English

FEE: On Request

INCLUDED IN THE FEE: Participation in the Training, Training Material, Field Visits

04 Operation and Maintenance of MHP Schemes

COURSE DESCRIPTION:	<p>The lifetime of a MHP plant is considerably increased when properly operated and maintained. Especially community based MHP schemes often face the challenge of ensuring good operation and maintenance practices are maintained over time. While one crucial aspect is the regular maintenance of technical equipment and appropriate trouble-shooting, a sound administrative setup and committed management is equally important.</p> <p>This training course covers the maintenance and operation of civil works as well as technical and electrical equipment. In addition, how to setup and run a functional village based management unit is an important part of the training.</p> <p>The course targets participants with prior experience in implementing MHP projects. Depending on the background of the group this course can be offered on a beginner or intermediate level.</p>
COURSE CONTENT:	<ul style="list-style-type: none">▪ Principles of MHP▪ Introduction to Civil Engineering▪ Turbine Technology and Performance▪ Generation & Electrical Equipment▪ Community-based Management and Administration▪ Payment and Adequate Tariffs▪ Introduction to Productive End Use▪ Field Visits
TARGET PARTICIPANTS:	Project Developers, Community, Trainers (i.e. Train-the-Trainers), Engineers, Vocational Schools
PREREQUISITES:	Beginner or Intermediate Level (Technical & Managerial)
DURATION:	5 Days (1 Week)
LANGUAGES AVAILABLE:	English, Bahasa Indonesia
FEE:	On Request
INCLUDED IN THE FEE:	Participation in the Training, Training Material, Field Visits

05 Site Identification for MHP

COURSE DESCRIPTION: The development of any MHP project starts with the identification of a feasible project site. Apart from the available streamflow over the year, the feasibility of the civil structures is a major consideration. The sound assessment of these basic preconditions is an essential component of a full feasibility study.

The training course aims at the pre-assessment of a potential MHP site. The participants will gain insights on techniques of site identification which comprises topics such as head & flow measurement, introduction to civil design and construction design and hydrological aspects of MHP implementation.

The course targets participants with prior experience in implementing MHP projects. Depending on the background of the group this course can be offered on a beginner or intermediate level.

It is suggested to combine this training course with course # 06.

COURSE CONTENT:

- Principles of MHP
- Introduction to Hydrology Survey and Topography
- Head & Flow Measurement
- Hydrological Aspect
- Introduction to MHP Design
- Introduction to Civil Construction Design
- Introduction to Community Mobilisation and Involvement
- Field Visits and Practice

TARGET PARTICIPANTS: Project Developers, Community Stakeholder, Trainers (i.e. Train-the-Trainers), Engineers, Vocational Schools

PREREQUISITES: Beginner or Intermediate Level (Technical & Managerial)

DURATION: 5 Days (1 Week)

LANGUAGES AVAILABLE: English, Bahasa Indonesia

FEE: On Request

INCLUDED IN THE FEE: Participation in the Training, Training Material, Field Visits

06 MHP Feasibility Study

COURSE DESCRIPTION: No project and no investment without feasibility study! A detailed study on the technical, economic, ecological and social feasibility of a MHP is the core document for all involved stakeholders and needs thorough preparation.

While course # 05 focus on the identification of an appropriate project site, this course addresses the technical and economic, but also ecological and social aspects. The training covers all aspects of a sound MHP feasibility study and enables the participants to assess the feasibility of proposed MHP schemes.

The course targets participants with a sound knowledge of MHP implementation to follow the technical prerequisites of the course. Depending on the background of the group this course can be offered on an intermediate or advanced level.

It is suggested to combine this training course with course # 05.

COURSE CONTENT:

- Principles of MHP
- Demand and load
- Introduction to Field Survey Instruments
- Assessment on Site's Potential
- Fundamentals and Institutional Setup
- Economic and Financial Analysis
- Payment and Tariffs
- Productive End Use
- Field Visits & Practice

TARGET PARTICIPANTS: Project Developers, Engineers, Vocational Schools

PREREQUISITES: Intermediate or Advanced Level (Technical & Managerial)

DURATION: 8 Days (1 1/2 Weeks)

LANGUAGES AVAILABLE: English, Bahasa Indonesia

FEE: On Request

INCLUDED IN THE FEE: Participation in the Training, Training Material, Field Visits

07 Equipment and Turbine Fabrication for MHP

COURSE DESCRIPTION: One key factor for the successful and sustainable operation of MHP plants is the quality of its technical equipment. This training course covers quality and manufacturing aspects of the mechanical MHP plant components. A special focus is set on the characteristics, performance and design of different turbine types. In-depth knowledge will be provided on the cross-flow turbine, supported by numerous practical lessons in the workshop.

A large part of the course includes practical exercises. This advanced level training addresses participants with a sound technical background and prior experiences in steel fabrication and machine shop work.

COURSE CONTENT:

- Principles of MHP
- Mechanical Components of an MHP
- Basics on Turbine Technology / Types of Turbines
- Principles of MHP Equipment Fabrication
- Characteristics of Cross-Flow Turbines
- Designing of Turbines
- Practice: Fabrication of a Cross-Flow Turbine
- Turbine Installation
- Hydraulic Design & Analysis
- Field and Manufacturer Visits

TARGET PARTICIPANTS: Manufacturers, Engineers, Educational Institutions

PREREQUISITES: Advanced Level (Technical)

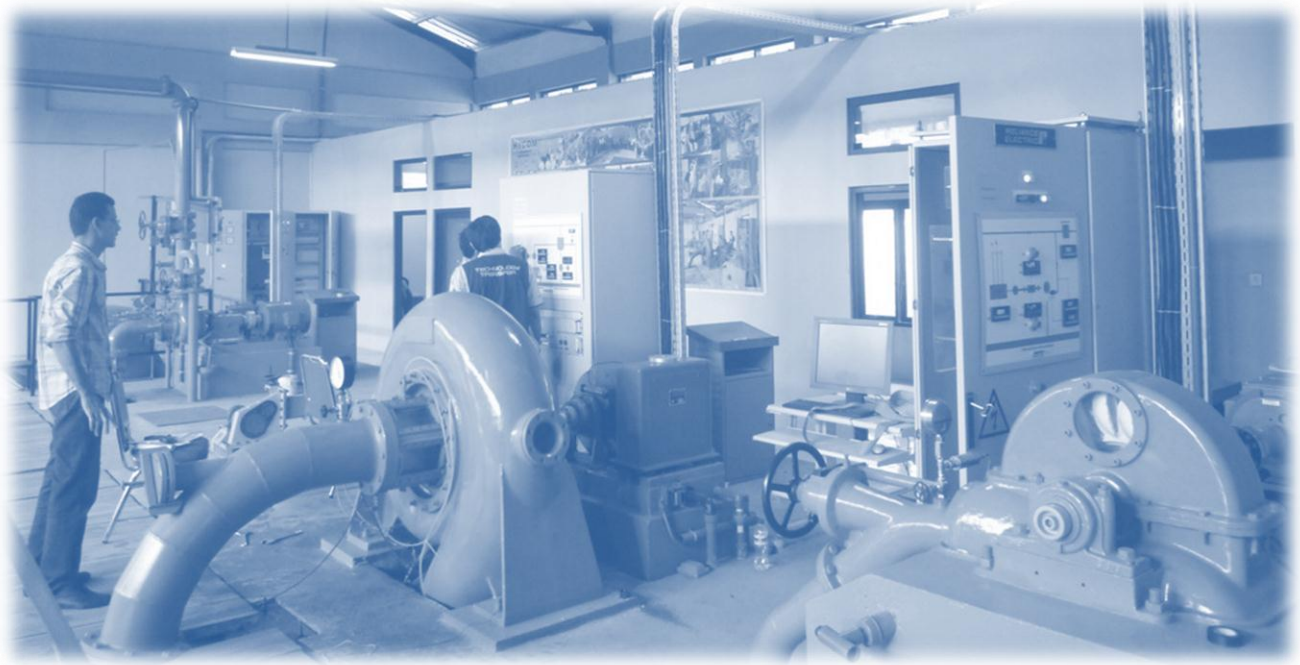
DURATION: 10 Days (2 Weeks)

LANGUAGES AVAILABLE: English, Bahasa Indonesia

FEE: On Request

INCLUDED IN THE FEE: Participation in the Training, Training Material, Field Visits

CONTACT DETAILS



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