

LIRE-Pico hydropower in Laos

Innovation and Capacity Building Program

Overview

Laos has a big potential for hydropower, because of its large mountainous areas. Over the past years, a lot of attention has gone out to developing large hydropower projects in tributaries of the Mekong River and there are even plans for mainstream dams. Although these projects can yield macro-economic benefits for the country, these projects usually do not benefit poor people in remote rural areas.

Small and very small hydropower has received much less attention from the government, multilateral organizations and NGOs. Nowadays pico-hydropower, with a power range between 2 kW and 5 kW, is very common in remote rural areas. It is completely market-driven and provides many people with a source of electricity. Estimations gives a value of 60,000 low-head pico-hydropower units providing electricity to around 90,000 households, making it the most important renewable energy technology in the country. Current challenges of this technology are the low quality hardware copies, risks of electrocution and electronic devices and light bulbs breaking easily. Many problems have been overcome by innovation of actors in the pico-hydro supply chain: users, village technicians, shopkeepers, traders and producers.

In 2008, LIRE started research on pico hydropower and found opportunities for scaling up and improving the quality and safety, efficiency and reliability of pico hydropower technology through existing and potential new market channels. To achieve these goals, LIRE, between 2008-2010, conducted the Capacity Building Program, funded by Dutch NGO ETC energy. The aim of the program is to educate various parties on issues surrounding pico hydropower technology via training sessions and technical document creation. The program is made up of the following 4 activities:

- Workshops for shop owners

The workshop aims to provide shop owners with basic technical understanding and market opportunities for the pico hydropower system.

- Workshop for technical advisors

Training aimed to build the network of technical advisors at different levels: provincial, district and village. Skilled people were selected as technical advisors; these technical advisors give technical advice to end users.

- Introduction of Electronic Load Controller (ELC)

One of the problems of pico hydropower is the unstable voltage produced; this situation is affected by the fluctuation of flow due to change in seasons. Unstable voltage can cause damage to electrical appliances, therefore to solve this problem, the ELC was introduced and promoted to end users.

- Edition of the Pico-hydro installation and user manual in Lao language

Even though pico hydropower has been used for a long time, there are no reference documents in the Lao language to help end users when they encounter technical issues. The installation and user manual in Lao was developed to help tackle this problem.



Workshop for shopkeepers



Workshop for technical advisors

Apart from the Innovation and Capacity building program, LIRE, in 2010, launched a demonstration project to promote shared pico hydro use. The project, funded by German embassy BORDA, was set up in Angsang village, Viengxay district, Houaphan province. LIRE did most of the implementation but villagers also contributed to some of the activities. The main objective of the project was to study and do research on the technical and management aspects of shared pico hydro. Experience gained from this project will lead to the development of an appropriate shared hydro pico operational model and technical design, and this will later be applied to other provinces, districts and villages.



Demonstration project on shared pico hydro in Angsang village, Viengxay district

17 old turbines were replaced with two 1 kW turbines, successfully providing electricity to 24 households, 3 teacher houses and a village development group office. On the management side, a village energy committee, village technicians and an accountant were assigned to take care of the system.

Activities

Workshops for shop owners

Between 2009-2010 LIRE conducted workshop for shopkeepers in three provinces in the northern part of Laos composing of Xiengkhuang, Houaphanh, and Phongsaly. There are three targeted districts each province. For Xiengkhuang, the workshops were hold in Phonsavan, and Kham district.



Workshop for shop owners in Xiengkhuang province



Workshop for shop owners in Phongsaly



Workshop for shop owners in Houaphanh province

- **Technical advisor**

LIRE pico hydro project's technical advisors were classified into 3 levels, consisting of provincial, district and village level. Between 2009 and 2010, training sessions for technical advisors were organized in 3 targeted provinces: Xiengkhaung, Houphanh, and Phongsaly.

- Xiengkhuang province

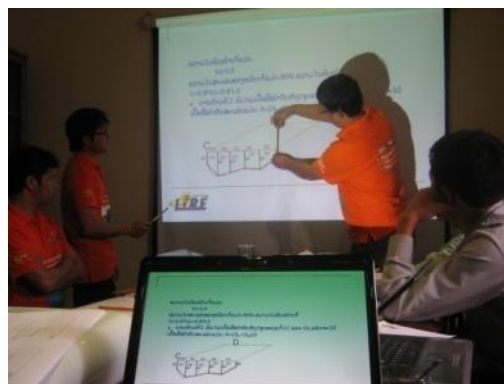
- 2 PDAs from PDEM, 1 DTA from Kham district, and 1 DTA from Khoun district, were trained by LIRE.
- VTAs from 5 targeted villages from Khoun district were trained by LIRE
- VTAs from 6 targeted villages from Kham district were trained by LIRE



VTA training in Kham district, Xiengkhuang province



VTA training in Khoun district, Xiengkhuang province



Training for PTA and DTA of Xiengkhaung province in LIRE office

➤ Houaphanh province

- 2 PDAs from PDEM, 1 DTA from Samneua district, and 1 DTA from Viengxai district, 1 DTA from Samtai district, were trained by LIRE.
- VTAs from 5 targeted villages from Samneua district were trained by LIRE
- VTAs from 5 targeted villages from Viengxai district were trained by LIRE
- VTAs from 5 targeted villages from Samtai district were trained by LIRE



PTA and DTA training in Houaphanh province



VTA training in Houaphan province

➤ Phongsaly province

- 2 PDAs from PDEM, 1 DTA from Phongsaly district, and 1 DTA from Bounneua district, 1 DTA from Bountai district, were trained by LIRE.
- VTAs from 5 targeted villages from Phongsaly district were trained by LIRE
- VTAs from 5 targeted villages from Bounneua district were trained by LIRE
- VTAs from 5 targeted villages from Bountai district were trained by LIRE



VTA training in Phongsaly province



PTA and DTA training in Phongsaly province

- **Hanging posters**

In order to disseminate information, LIRE created posters advising people on where/how to get advice from technical advisors, where to get the manual, info on VDO training, ELC etc. Those posters were displayed in public places such as: PDEM, District Cabinet Office, markets, restaurants, bus station, village development group office, and village offices, with the objective of spreading the information to as many people as possible.



**Hanging poster at PDEM
in Xiengkhaung province**



**Hanging poster in the Administrative
Office of Phongsaly district**



**Hanging poster at a restaurant in
Phongsaly province**



**Hanging poster at an electronics shop
in Phongsaly province**