CASE STUDY

Rural villages generate hydropower and income
Indonesia's micro hydropower projects

Key point

- ***The potential of micro hydropower generation can be tapped through financial and regulatory policies as well as by innovative community-based participation.***

There was a problem…

Around 100 million Indonesians in rural areas still live without electricity. And yet, despite there being a large potential for the generation of electricity from hydropower in Indonesia, the actual production remains marginal, amounting to about 5 per cent for large-scale hydropower plants (4,264 MW of production of a total 75,670 MW of projected capacity).[1] Only 17 per cent of micro hydropower generation has been developed of the 500 MW of potential capacity.[2] When hydropower appeared on the high-hopes horizon, it quickly came up against financial and regulatory obstacles as well as the overpowering competitive forces of the state-owned electricity company.

What was done?

In the 1990s, a young woman and social justice activist working with poor communities in West Java, Tri Mumpuni, started a business group NGO that has built community-run hydropower plants. The NGO, IBEKA, also known as People Centered Business and Economic Institute, works in rural areas with village communities to adopt people-centred economic systems, with an emphasis on energy and electricity services. IBEKA advocates community ownership for each micro hydropower system.

When a village asks for a micro hydropower (MHP) project, a public meeting is organized to identify the poorest group in the community. The people with no land, capital, employment and education are prioritized for inclusion in the project. A community cooperative typically is set up. Some projects are co-managed with private investors, while others have become fully owned by the community. IBEKA trains the community members to manage the system technically and financially. Before the system is up and running, IBEKA helps them plan the funding of the system, organize construction and maintenance, and set priorities for the generated revenue. After the MHP system is built, the community begins to receive a gross monthly income of approximately 31 million rupiah (US$3,300). The revenue is divided equally with the business partner, if there is one, after deducting for the cost of operating and maintenance. The remaining funds are then used for scholarships, an emergency health fund, a health facility and seed money for farmers.[3]

Institutionalizing the on- and off-grid connection to take on market forces

Once the state-owned and subsidized electricity company, PLN, entered the market, many of the operations found it difficult to survive. Mumpuni lobbied the Government for three years with three successive energy ministers to allow small electricity producers to sell back to the grid. As a result of Tri Mumpuni's persistent campaigns and lobbying for changes in state policy, new regulations supportive of micro hydropower were issued by the Ministry of Energy and Mineral Resources. The regulations made it mandatory for the state-owned utility to buy all small-scale power. In 2004, the state utility was also mandated to buy all medium-voltage co-generated power

[1] International Trade Administration, *World Factsheet: Hydropower Market in Indonesia* (Washington, D.C., Department of Commerce, 2010). Available from http://ita.doc.gov/td/energy/Indonesia%20Renewable%20Energy%20Assessment%20(FINAL).pdf (accessed 27 January 2012).

[2] ibid.

[3] ASHOKA, "Tri Mumpuni". Available from www.ashoka.org/node/3870 (accessed 20 February 2012).

as well.[4] This now requires that PLN purchases energy generated by the community projects and other renewable energy-based electricity sources by providing tariff mechanisms under power purchasing agreements.[5]

Under the IBEKA project, MHP plants with more than 2 MW of generation capacity can link the generated electricity to the central grid and gain revenue through the feed-in tariff.[6] Simultaneously, smaller off-grid plants, up to 0.5 MW, help to increase local productivity in such areas as agribusiness.[7]

An attractive business model

The business model has attracted private investment. Additionally, IBEKA finances its projects through different schemes, but mostly through grants from international donors, corporate social responsibility programmes of large corporations and funding organizations.

Mumpuni developed a pro-poor public-private partnership model for rural electrification and approached UNESCAP for equity funding. With this model, IBEKA has made joint ventures between community cooperatives and private investors feasible. IBEKA also established a centre of excellence for people to learn about micro hydropower systems for rural development. Through training programmes, IBEKA helps to educate many local government officials as well as other interested institutions within the Asia-Pacific region.

Results

IBEKA has built 60 community-run hydropower plants with 5–250 kW capacity so far that have provided electricity to 500,000 people in rural Indonesia. Tri Mumpuni and IBEKA are currently working on developing a plastic turbine for use in compact hydropower plants situated along rivers. Villagers are participating fully in the planning, construction and maintenance of the facilities in a cooperative manner. Most future plants will generate 5–60 kW, but some will have the capacity to produce up to half a megawatt.[8]

Success factors

The great potential in hydropower generation remained untapped for a long time in Indonesia, largely due to the lack of legal and financial institutions. Aware of this gap, ensuing campaigns and lobbying sought binding and enabling government regulations in parallel with a grass-roots movement propelled by local populations. The effective and simultaneous combination of bottom-up and top-down approaches was pivotal for the success.

Considerations for replicating

All regulatory barriers must to be removed to successfully develop community-run micro hydropower plants as a local business.[9] Simultaneously, empowerment and capacity building of community members to generate their command and ownership of the projects is necessary.

[4] ibid.

[5] Jon Respati, "Small hydro in Indonesia: finding the right price", *RESPECTS Renewable Energy Review*, October 2010. Available from http://respectsmagazine.com/format/respects3rd-edition.pdf (accessed on 5 January 2012).

[6] In 2009 a new regulation was issued which graded the proposed PLN purchasing price relative to regional electricity costs and needs.

[7] Siemens Stiftung and Ashoka, "Siemens Stiftung and Ashoka encourage entrepreneurs developing technologies for human needs: Investment profiles of participating social entrepreneurs" (2011). Available from www.siemens-stiftung.org/fileadmin/user_upload/gesellschaft_technik/Ashoka_Investment_final.pdf (accessed 5 January 2012).

[8] Nikesh Thapaliya, "Definition of social entrepreneurship: Tri Mumpuni", *Youth Leader Positive Action Magazine*, September 2011. Available from www.asia.youth-leader.org/?p=3457 (accessed on 22 November 2011).

[9] ibid.