



United Nations Environment Programme

برنامج الأمم المتحدة للبيئة • 联合国环境规划署

PROGRAMME DES NATIONS UNIES POUR L'ENVIRONNEMENT • PROGRAMA DE LAS NACIONES UNIDAS PARA EL MEDIO AMBIENTE

ПРОГРАММА ОРГАНИЗАЦИИ ОБЪЕДИНЕННЫХ НАЦИЙ ПО ОКРУЖАЮЩЕЙ СРЕДЕ

Aceh Solar Energy Technology Loan Programme

As part of reconstruction efforts after devastating tsunami in 2004, the German Ministry of Environment (BMU) and United Nations Environment Programme (UNEP) have launched the Aceh Solar Energy Technology Loan Programme to overcome limited access to credit from local banks, providing targeted end-user credit or loans to entrepreneurs investing in commercial solar energy applications, particularly solar dryers. Solar drying can cost-effectively improve the production and quality coffee, betel nut, fish, and cocoa, improving both local incomes and livelihoods.

Rebuilding with Renewable Energy

In December 2004, the Indian Ocean tsunami ravaged the Aceh region of Indonesia, leaving more than 100,000 people dead and 500,000 homeless. The tsunami wiped out 97% of Aceh's economy, and destroyed 15% of the island's household incomes, which were largely reliant on agriculture and fishing.

Aceh's economic recovery depends on affordable and reliable energy solutions, and presents an opportunity to rebuild with clean and sustainable energy resources. Better energy services are particularly important for Aceh's farmers and fishermen who commonly sun-dry their crops and fish in the open air, and only occasionally use mechanical dryers powered by fossil fuels due to the volatility of fuel prices, unreliable supply, and potential loss of quality from the contamination by exhaust fumes.

The gradual dismantling of government subsidies for diesel and kerosene, however, (US\$10 billion in 2004, or 3.5% GDP) and rising oil prices, has dramatically increased the cost of energy along with chronic problems of distribution. Consequently, a substantial number of renewable energy applications that were previously considered too expensive are now financially attractive alternatives to fossil fuels, including the use of commercial solar dryers.

Solar dryers have many advantages, including:

- Reduced land requirements and labor costs;
- Reduced vulnerability to climate variability, rains, humidity, mold, and fungi;
- Improved product quality, including the consistency of moisture content and reduced contamination from debris and insects;
- A cost-effective alternative to poor distribution networks for petroleum products, and
- Enhanced opportunities for employment and income.

Effective marketing of solar energy technologies such as solar dryers can help communities recovering from the tsunami access cleaner energy with lower greenhouse gas emissions while increasing productivity and creating opportunities for small rural enterprises. Expanding markets for other solar technologies, such as photovoltaic solar home systems, can also bring reliable power to a significant proportion of Indonesian households that do not have access to

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grid-based electrical power, and rely instead on expensive and unsustainable kerosene lamps and diesel generators.

Aceh Solar Energy Technology Loan Programme

One of the most significant barriers faced by Indonesian small and medium-sized enterprises (SME) and entrepreneurs seeking better energy services is the significant initial cost of solar technologies compared to the minimal capital investments for simple sun drying. The German Ministry of Environment (BMU) and United Nations Environment Programme (UNEP) have launched the Aceh Solar Energy Technology Loan Programme to overcome limited access to credit from local banks by providing targeted end-user credit or loans to entrepreneurs investing in commercial solar energy applications.

The Programme aims to stimulate markets for solar energy technologies, focusing first on expanding the use of solar dryers to help the recovering agriculture and fishing sectors rebuild with cleaner solar energy.

Targeted Commercial Lending

Although Indonesia has a banking system with adequate funds and a strong business motivation to enhance their credit portfolios, consumer finance for solar energy products is weak, mainly due to concerns about technological reliability and commercial feasibility. The Aceh Solar Energy Technology Loan Programme is helping to overcome this barrier by supporting local banks to develop and mainstream finance products for solar technologies, while also providing local businesses with an affordable source of clean energy for crop and fish drying.

To create a sustainable commercial environment for solar energy lending, the Programme:

- Promote the benefit of using solar dryer technology among crop producers and fishermen in the targeted market areas;
- Assists potential users of solar dryer technology in selecting and monitoring credible vendors with reliable after sales service;
- Improves access to credit and enhances the financial capacity of the borrower; and
- Improves terms of lending.

From a banker's perspective, the Programme improves the commercial viability of solar technologies, including the selection and monitoring of suitable vendors with reliable warranty, promotion of good practices and technological standards, and in-depth risk and market analyses.

The Aceh Solar Energy Technology Loan Programme runs from 2008-2010, with external support mechanisms such as interest rate reductions and credit guarantees phased out progressively as banks increase their confidence to lend for solar technologies.

To overcome market distortions after the tsunami, the Programme offers selective measures to mitigate risks that address the majority of ongoing reconstruction efforts based largely grant-

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based and non-commercial donor projects. Such risk mitigation measures are also needed because the tsunami diminished the economic capacity of prospective borrowers to repay loans and local banks are apprehensive of their ability to recover loans.

Solar product sales and service networks in Aceh are small and limited to specific provinces and customer segments. Consequently, the Programme will grow along existing networks so increased access to credit can progressively improve markets and geographical coverage. Capacity of partner banks to develop specialized lending products is crucial for scaling-up operations and accommodating growing demand and sales.

Pilot Projects

The Aceh region of Indonesia was chosen because solar drying of crops and fish is economically and technologically viable, with a significant potential to create social benefits.

Coffee Drying

The highland area of Central Aceh is the centre of coffee production, representing approximately 55% of national production for arabica coffee. Central Aceh is in particular need of tsunami recovery due to a lack of donor aid compared to coastal efforts. Stimulating investment and support for agriculture inland entrepreneurs can also help to diversify economic opportunities for Aceh communities beyond coastal areas.

Central Aceh hosts around 30 different coffee mills within a 30 km radius, each with a minimum production capacity of one ton per day. Locally produced coffee, known as Gayo Coffee, is sold to local and international specialty markets, including Starbucks.

Central Aceh's concentration of coffee producers provides a large potential for replicating and expanding finance for solar dryer products, and would therefore be more likely to attract commercial lending institutions. In addition, the main export markets for Takengon coffee in Europe, USA, and Japan are sensitive to both product quality and volume. The uniformity of the product standards and drying capacity are therefore crucial for sustaining and expanding the market.

Solar drying is expected to conservatively reduce the percentage of coffee beans rejected prior to export by Central Aceh coffee mills from the current 20% to 15%, while increasing production capacity, overall efficiency, and reducing labor costs.

Cocoa and Betel Nut Drying

Aceh Pidie and Southwest Aceh has a dense population and is a major center for cocoa and betel nut production – Aceh's second and third most exported commodities. The Aceh Solar Energy Technology Loan Programme aims to replace the current practice of sun-drying crops on patios and sidewalks with hybrid solar dryers that can reduce the vulnerability of cocoa beans to climatic conditions when sun-dried, particularly during the rainy season when an extra 3 to 4 days are required for sun-drying.

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Fish Drying

Before 2004, Southwest Aceh was the largest fish-producing region in Aceh. This capacity, however, was decimated by the tsunami, with annual fish production dropping the next year by more than 60%. The fish-drying pilot is in the Susoh sub-district, home of the largest fish market in Southwest Aceh where the infrastructure and human resources can support a growing solar dryer market. Susoh has also been poorly supported by donor grants compared to other areas of Aceh, and support to date has focused on fishermen but not on local fish processors who are the focus of the Aceh Solar Energy Technology Loan Programme.

Drying fish in solar dryers can reduce labor cost, decrease the quantity of inedible/poor quality fish, and substantially decrease drying times.

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