Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

INTERNATIONAL CLIMATE INITIATIVE (IKI)

Renewable Energy Resources for the Galápagos Islands

The Galápagos Islands are an ecosystem of global significance. Since 1959, the archipelago has been a national park protected by the government of Ecuador. In 1979, UNESCO declared the islands World Natural Heritage. With a population estimated at some 30,000 on the archipelago's four inhabited islands, the 200,000 tourists who visit the islands each year are the most important source of income. So far, diesel generators using fuel transported to the island by sea, form the basis for electricity generation. As a result the Galápagos Islands have repeatedly suffered from tanker accidents and oil spills.

IKI PROJECT EXAMPLE:

The IKI project "Renewable Energy Resources for the Galápagos Islands" (ENERGAL) ran from 2012 until 2015 and was part of the Ecuadorian government's initiative "No Fossil Fuel on the Galápagos". The aim of the project was to substitute diesel and its derivatives with biofuels for electricity generation on the islands. This was done specifically through the use of pure plant oil (PPO) extracted from the fruits of the jatropha curcas plant. The project's focus was on small agricultural producers in the coastal province of Manabí, who use the plants as "natural hedges". The project involved investment, policy advice, specific consulting contracts and training of small agricultural producers through workshops as well as knowledge and experience transfer.

The project was implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on behalf of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB). It was funded through the International Climate Initiative (IKI).

Initial project objectives:

- Support the Ecuadorian government and other relevant actors in the adequate use of renewable energy resources on the Galápagos Islands. The project promotes thermal electricity generation on the island of Floreana with jatropha PPO as well as the reactivation of an existing photovoltaic (PV) plant. Aiming at the reduction of CO_2 emissions, the project also promotes further feed-in of thermal and PV electricity into a hybrid system that is to be expanded into an intelligent grid.
- Small rural communities and especially women generate additional income with the production of PPO by means of a producer cooperative in the coastal province of Manabí.
- Actors from both the private and public sector at the local, regional and national level are trained to introduce renewable energies to the energy mix.
- Plant oil producers in small rural communities are trained in the maintenance of existing jatropha curcas hedges as well as in the management of the PPO communal producer cooperative.

Project Strategies:

- Establishment of hybrid systems and intelligent grids: The programme promotes the establishment of hybrid grids on the islands of Floreana and Isabela, in which photovoltaic energy is integrated with thermal energy from jatropha PPO. Based on this hybridisation, Ecuador's first intelligent energy grid will be created on the island of Floreana; a computer-controlled system will optimise electricity generation and distribution and reconcile supply with demand.
- Production of plant oil in rural communities: In Manabí

province, thousands of kilometres of jatropha hedges will be exploited for oil generation, increasing the amount of oil produced in the communal pressing facilities. In addition, research facilities will be supported in using agricultural and processing knowledge as well as in the use of biofuels.
- Knowledge transfer and experience exchange about the use of renewable energy resources: The formation of networks will be stimulated which promote knowledge transfer and exchange of experience in the use of renewable energy resources and the sustainable production of PPO biofuels.

Expected impact:

- Mitigation of contamination risk to the Galápagos ecosystem.
- Initial introduction of hybrid system on the islands of Floreana and Isabela. The energy generated by PV and the jatropha thermal process leads to the establishment of the first intelligent grid in Ecuador on the island of Floreana.
- Technical support for Electricity and Renewable Energy Ministry (MEER) and energy provider ELECGALAPAGOS for substituting fossil fuels with electricity generated from jatropha PPO.
- Generation of supplementary income for rural production communities in Manabí.
- Establishment of a cooperative for oil extraction.
- Knowledge transfer and experience exchange.

Project achievements to date:

- During harvest, 800 families from 50 communities in Manabí province have generated a supplementary income of USD 50 per family by harvesting sufficient jatropha fruits to satisfy the oil demand on the island of Floreana and to begin to supply the island of Isabela.
- Preparation of a feasibility study for the substitution of fossil fuels by biofuels for electricity generation on the island of Floreana.
- Implementation of an educational programme on renewable energy resources and energy efficiency.
- Dedication of a power plant with two dual generators of German manufacturing with 69 kilowatts (KW) output each. The new power plant supplies the island of Floreana with electricity around the clock.
- Draft and implementation of a new logistics concept for the transport of biofuels to Floreana.
- Ten educational seminars on renewable energy resources and energy efficiency held on the Galápagos Islands and the mainland as well as a technical conference in Berlin.
- Study tour in Denmark and in Germany with stakeholders from MEER and ELECGALAPAGOS.
- Furnishing the Ecuadoran Instituto Nacional de Investigaciones Agropecuarias (INIAP) with laboratory equipment for monitoring the quality of the oil and delivery of a plant-oil propelled vehicle to a university in Ecuador.

Find more information on the project at:
http://195.76.147.227/renforus/site/?p=1643

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