



Case Study – Small Scale Bioenergy

Background

Your organisation is engaged in a project to increase access to energy in the outer islands of Kava. Kava is a group of 150 islands in the Pacific Ocean, 500 km from the coast of the main island. The population of Kava is 600,000. Half of that population resides in the two main cities on the main island, a further quarter of the population is spread between 10 smaller towns on the main island and 8 of the other islands, and the remainder of the population resides in communities of 100-200 people on the outer islands.

- The total population of Kava is 600,000. Half of that population resides in the two main cities on the main island, a further quarter of the population is spread between 10 smaller towns on the main island and 8 of the other islands, and the remainder of the population resides in communities of 100-200 people on the outer islands.
- Population growth rates are 2.5% with an increasing number of people from the outer islands moving into the urban centres, meaning there is declining population in the outer islands.
- Rural populations in Kava are primarily non-cash economies with the main sources of livelihoods being fishing, subsistence agriculture (kava (of course), taro, papaya, yams okra, mango, eggplant and coconut), animal husbandry (cows, pigs, goats and honeybees),



Integrated Assessment Tools for Small Scale Renewable Energy Projects Regional Training Workshop

- There is farming assistance available on the main islands but limited assistance available in the outer islands.
- Land is communally managed and rights to land access are managed through community decision processes and then registered with the central government.
- The country experiences cyclones on a seasonal basis.
- Biodiversity on several of the outer islands is rich, with endemic species dominating the mix particularly in highlands where there is less agricultural activity and in islands which are not settled.
- Invasive species are an issue particularly where habitats have been modified for agriculture and settlements. Many of the outer islands have experienced further erosion of ecosystems from the introduction of invasive species such as pigs, goats and mongoose as well as plant species such as passion fruit and elephant grass.
- There are limited controls in place to manage the risk of introduction of invasive species.
- Coconut plantations exist, but are 50-60 years old
- Coconut plantations are primarily along the coasts and are often inter-cropped.
- Cows and goats are allowed to graze in coconut plantations where there is no intercropping.
- Farmers gather coconuts when they need money, and sell to the local market for local consumption.
- Some copra is dried using husks and shells and wood and then transported in inter-island boats to the larger cities for consumption there or for export.
- There are 2 buyers for export markets in each of the main cities in Kava.
- Farmers typically manage 1-5 hectares of land.
- Good (low-lying) agriculture land is increasingly scarce everywhere, and particularly in the outer islands.

Project

- The project will be implemented in 30 islands
- Cook-stoves will be given to 200,000 households
- Multifunctional platforms will be provided to 500 communities
- The total project budget is 2.5 million USD.

More information

Plant oil cookstoves



Integrated Assessment Tools for Small Scale Renewable Energy Projects Regional Training Workshop

The plant oil is filled in the tank. The burner is pre-heated with a small amount of alcohol or other fuel source. Through application of the pump, the tank is pressurized with 1.0 bar. The oil rises into the vaporizer where the heat of the flame converts the liquid into a gaseous mixture. The gas flux emits from a nozzle into the burning area, where it mixes with surrounding air and burns in a blue flame. The power output can be adjusted with a valve in the fuel line.

Power Range: 1.9 - 2.6 kW

Durability: ~ 4000 h

Efficiency: 55%

Fuel: Various plant oils, plant oil esters

Usage: 1 l = 3-5 h

Emissions: Ten times lower than a high

Noise Level: 67 - 69 dB

quality kerosene stove

The Multifunctional Platform

- The multifunctional platform is built around a diesel engine, which can also run off pure vegetable oil.
-