

Energy-Saving Institutional Stoves in the Mt. Kenya Region, Kenya

Themes

- ★ Energy Efficiency
- * Linkages with other environmental goals
- ❖ Financing mechanisms and private sector involvement
- * Education (MDG 2)
- * Health (MDGs 4-6)

PROJECT DATA

Name: Energy-Saving Institutional Stoves
Implementing Organization: Renewable Energy Technology Assistance Programme (NGO)
Location: rural areas around the Mt. Kenya World Heritage Site, Kenya
SGP Contribution: \$45,000
Start Date: August 2001

ENERGY OVERVIEW

Energy Resource: biomass
Technology: stainless steel, brick-insulated, energy-efficient stoves
Application: cooking and water heating
Sector: public (education)
Efficiency improvement: 60 - 70% biomass fuel saved
Institutions Served: 100 schools in Mt. Kenya Region (20 resulting from SGP funding), and a total of 150 schools nationally, including non-SGP funded areas

BACKGROUND

About 80% of the Kenyan population relies on biomass-based energy for cooking and heating. One set of biomass users includes educational institutions (primary and secondary schools, as well as colleges). Of Kenya's 20,000 educational institutions, about 90% use wood fuel to prepare meals. Firewood collection leads to the destruction of trees that could absorb carbon dioxide emissions and degrades local ecosystems, particularly in the watershed region of Mt. Kenya, a World Heritage Site. Recently, the Kenyan government has banned the collection of firewood from the World Heritage Site itself. This has caused a significant rise in the cost of firewood for schools in the area, which now pay approximately \$25 per ton. Finally, in some schools children use significant amounts of time searching for fuel wood – time which could otherwise be spent on learning.

PROJECT DESCRIPTION

Overview

This project involves replacing open fire cooking systems in schools with heavy-duty, brick-insulated stainless steel stoves that require 60 - 70% less firewood. In doing so, schools save money on fuel costs and reduce smoke and emissions. In schools where children must collect firewood, the use of more efficient stoves allows children to spend more time studying.



Heavy-duty brick-insulated stainless steel stoves, school kitchen (Kenya).

Implementation

The implementing NGO, the Renewable Energy Technical Assistance Programme (RETAP), has addressed financial barriers via a credit system that enables a school to pay off the cost of a stove over two years. Some schools have also started planting their own woodlots, using certain varieties of eucalyptus trees, to grow their own fuel. Since the new stoves use much less fuel than before, the schools may even be able to sell excess wood to other schools and tea and tobacco factories in the region, thereby generating income for the school. A number of schools estimate that the financial savings resulting from the stoves and woodlots may translate into 5-10% reductions in the cost of education per year.

Environmental Benefits

Global: So far, a total of 100 schools in the Mt. Kenya region have installed improved stoves. Prior to installation, each school used an average of about 160 tons of wood per year. The new stoves have saved each school 96 tons per year, making the total reduction in firewood use about 9600 tons annually. In addition, some schools have begun to plant their own trees (20 schools participating in the SGP-funded project planted a total of 100 acres of forest). Together, the reduced firewood use and increased tree planting reduces carbon dioxide emissions and increases carbon sinks.

Local: The local environment benefits substantially, since the forests suffer less degradation and tree loss. Water resources in the region are also better protected due to less forest destruction. Further, the planting of fast growing eucalyptus trees as alternative sources of fuelwood has contributed to conservation of the indigenous species within the World Heritage Site.

Local Livelihood Benefits

Education: Schools with the improved stoves spend 60% less on fuel costs. A school with an average of 300 students saves \$1,025 per year, not counting the initial purchase of the stove. This means that educational institutions can channel these savings, totaling \$100,000 so far, to meet other needs, such as reducing tuition costs, providing extra instructors, and improving facilities. Some schools have also required students to help search for firewood. Where this is the case, these students will no longer have to collect so much firewood, thereby allowing them more time to study. The project has also provided practical environmental education for students, focusing on energy efficiency, tree planting and biodiversity conservation. Environmental education for students is essential in securing sustainable management of energy and forest resources in the future.

Savings/income generation: The direct financial savings from reduced fuel wood use represent a significant economic benefit to schools. The cost of stoves is repaid using financial savings accrued from reduced fuel wood use, thus schools do not have to incur additional debts and/or raise money from other sources. This self-financing of the stoves is the most unique innovation of the project and underpins the success and sustainability of the revolving fund credit scheme. Taking into account the fact that the stoves have a lifespan of ten years, and the credit is fully repaid in two years, the financial savings in the subsequent years can be treated as direct economic benefits to the schools.

Partners

The Mt. Kenya region World Heritage Site is part of the Community Management of Protected Areas Conservation (COMPACT) effort. This initiative is the result of a collaboration at the global level between the GEF Small Grants Programme and the United Nations Foundation to promote community involvement in protecting World Heritage sites. The RETAP project was funded by SGP in this context, since it reduces threats to the area's forests while also improving livelihoods. The project has also been co-financed by the Ashden Trust of United Kingdom. Another partner has been the Forest Department and Tree Bio-technology Project in Kenya. RETAP has received seedlings and technical advice from them in order to start the woodlots.

Locally, RETAP works with schools, helping them to understand the benefits the stoves can offer and then working with them to make this financially possible. RETAP also works with the private companies producing the stoves to ensure that they produce high-quality stoves and provide much valued after-sale repair and maintenance. The fact that schools are guaranteed quality products and after-sale support gives them the confidence to acquire the stoves and pay for them in installments over a two-year period.

LESSONS LEARNED

Environmental Management

The project experience suggests that kitchen staff and school management needed more training on how to maintain the stoves so that the stoves last as long as possible (10-15 years with good maintenance). In addition, since schools do not keep good records of their energy use, many do not realize how much they could save with the stoves. Additional training on bookkeeping is also necessary to address this problem.

Barrier Removal

Financial: Additional financial resources are necessary to remove financial barriers. Since the producers of the stoves are generally small-scale businesses, they require full payment for the stoves at the time of purchase. Therefore, another source of credit is necessary to enable schools to make the purchases. Also, a larger project would have better economies of scale, leading to significant reduction in the final cost of stoves to schools.

Institutional: Currently, there is no setting in which educational and other institutions can come together to discuss common energy concerns. This would be of great help in addressing other barriers, including the policy barriers listed below, as well as leveraging additional funding and support from the government and the private sector in Kenya.

Policy: The project has not addressed policy barriers, but has identified some of them. They include the requirement that stove producers pay VAT taxes for stoves delivered to schools, yet other essential learning inputs are tax exempt. Lack of quality standards for stove production is another barrier. These two elements must be addressed if the project is to be successfully scaled up.

Scaling Up

There is good potential for scaling up this project. In the Mt. Kenya area alone, there are 400 remaining educational institutions that could use the improved stoves. However, in order to scale up, the barriers listed above must be addressed. In addition, the manufacture of stoves must be spread over a wider number of producers. This can help keep the prices of the stoves from rising as demand increases.

SOURCES CONSULTED

- Project Record KEN/UNF-GEF/01/01, SGP Project Database, <http://www.undp.org/sgp>
- Kenya SGP National Coordinator, 2002. "Energy Saving Institutional Stoves: Removing barriers to the adoption of energy saving stoves in institutions around Mt. Kenya. A GEF/SGP Project for Upscaling to a Medium-Size GEF Project."
- SGP Kenya. "Community-based Alternative Energy Systems." Booklet 2, 2002.
- Email communication with Charles Kirubi, executive director, RETAP, September and October 2003.