

## GEF Small Grants Programme

# NICARAGUA: Adopting Energy Efficient Cook Stoves and Sustainable Forest Management near the Cerro Apante Natural Reserve

**Project No:** NIC/SGP/OP5/CORE/CC/2011/17

**Grantee:** Asociacion de Desarrollo Comunitario de Matagalpa (ASODECOMAT)

**Location:** San Ramón, Matagalpa

**SGP Contribution:** US\$ 4,560

**Cash Co-Financing:** US\$ 27,139

**In-Kind Co-Financing:** US\$ 22,479

**Project Duration:** 09/2011 – 10/2012

**Number of people benefiting:** 342 families

**Focal area:** Climate Change

### Project Description

Located in the mountain range of Apante Hill, a protected area, five communities carried out a project to address local deforestation and land degradation. The main strategies were the introduction of an eco-stove that requires less firewood and training in improved agricultural practices. The project eliminated 1,080 tons of CO<sub>2</sub> emissions per year and reforested 4.3 hectares of degraded land.

### Background

The project took place in five communities located in the hills of Apante and Kawasquilla, southwest of Matagalpa. The mountain range of Apante Hill, a protected area, comprises a preserved tropical forest, - some in pristine condition, rich in fauna and flora. There are 75 species of plants, including a mix of trees, shrubs, vines and epiphytes.

The forest is also an important habitat some endangered species such as the spider monkey (*Ateles geoffroyi*), the howler monkey (*Alouatta palliata*), the peacock (*Crax rubra*) and chachalacas (*Highland guan*).

Forming part of the forested watershed of the Rio Grande de Matagalpa and the Atlantic, the area serves as main source for irrigation water for the surrounding communities downstream. The environmental situation in this area and, specifically, in the five communities, is the progressive deterioration of its landscape, due to agricultural expansion for coffee, basic grains and cattle. In particular, agriculture, which provides the main basis for the livelihoods of 1,850 families in the area, has contributed to deforestation and the pollution of the local watershed.

The use of firewood as primary energy source for cooking, on the other hand, has been exerting additional pressure on forest resources. Although the forest belongs mainly to small farmers, many families do not have access to firewood due to the strong degradation of the forest resources. Consequently, poor families then often resort to healthy forests in the protected area or enter the private property of big farmers to extract firewood. In sum, deforestation and unsustainable agricultural practices have impacted the health of the local watershed and its water supply, which had already been strained by a strong reduction in the raining season.



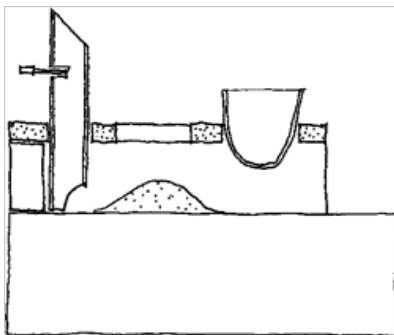
Traditional, open-fire cook stoves

### Project Implementation and Key Activities

The goal of the SGP project, which was initiated by the CBO ASODECOMAT, was to rehabilitate local land, including the watershed area, and develop sustainable forest practices. To achieve this, the CBO sought to strengthen the local capacity of the communities on the proper use of natural resources. A key focus of ASODECOMAT was to encourage the use of energy efficient cook stoves to reduce the consumption of firewood and to promote tree planting to provide a sustainable energy source for the stoves. Based on previous positive experiences with this concept in three other communities in the area, ASODECOMAT worked with SGP to replicate the project in these five communities.

The intervention targeted 342 low-income families located at the highly degraded top and southwestern parts of the protected area. The project participants were trained in how to build improved cook stoves so they can build and replicate the concept in their communities. In addition, they learned about sustainable, agricultural practices, including planting hedgerows, establishing tree nurseries and managing forests. Gender sensitivity training was an important component in all sessions.

### About the Energy Efficient Cook Stove Technology



The CETA modified eco-stove features two burners and a chimney and is effective for pots of up to 12 litres capacity. It works especially well for foods that require direct heat such as rice. This stove model, which costs about \$44, is widely used in rural Nicaragua, Guatemala and El Salvador. It is mainly built from simple materials such as clay, bricks, cast iron, cement, metal, and mud. Achieving high fuel economy and reductions in smoke, the stove meets the standards of fuel savings and reduced carbon inside homes. Its design is similar to the

traditional kitchen, - a feature that facilitates the adoption of the technology in rural households.

SGP Nicaragua's intervention point was to support the dissemination of the efficient stove, and help the women refine the stove model to suit their own local, traditional kitchens. The "know-how" of the stove technology was initially transferred through "train-the-trainer" concept. Initially, 4 environmental promoters were trained by a local NGO who then trained another 11 women in the construction of the stove through a workshop. Much learning rested on "learning by doing" (tacit learning). The women trainees, who were selected by their communities, then built and replicated the stoves for other households in their communities. Relatives and other beneficiaries joined in at the stove building.



CETA Modified Eco-Stove

### Environmental Impact

Through the training sessions, project trainees managed to build 300 energy efficient stoves for their community households. As a result, the project brought about a notable reduction (50%) in firewood consumption. These energy savings translate into an elimination of 1,080 tons of CO<sub>2</sub> emissions on an annual basis.

The proposed efficient stove technology was accepted by the beneficiaries because they were also introduced to various practices for sustainable natural resource management through workshops held by the Ministry of Natural Resources. More than 300 community members became more aware of the importance of sustainable forest management, learning about environmental protection; techniques for reforestation and crop diversification to relieve pressure on forest degradation; and pollution prevention of the principal watershed of the protected area. The increased awareness motivated participants to rehabilitate the forest. Giving priority to reforestation in the river areas, the project participants managed to plant more than 6,000 tree seedlings covering 4.3 hectares of degraded forestland in the main watershed area. One part was reserved as an energy forest.



Reforestation of the degraded watershed area

### Socio-Economic Impact

The energy efficient stoves improved living conditions in participating households. For one, 15 environmental activists were trained in the construction and maintenance of the stoves. This skill has provided them with the opportunity to earn additional income. Moreover, the eco-stoves require 50% less firewood than the old models, which resulted in considerable financial savings as families were able to downsize their purchases. For those women who could not afford to buy firewood, the time required to search and collect firewood was cut down in half. Health conditions improved as well. The new eco-stove is enclosed and has a chimney. It thus eliminates indoor toxic fumes, which primarily affect women and children, from the houses and reduces the risk of burn injuries for children. Overall, these energy efficient stoves are appreciated as an improvement in the houses, if not seen as more beautiful than the traditional open cook stove models.



Families enjoy indoor cook stoves with ventilation, eliminating smoke



The project focused primarily on women because most male farmers migrate for work further north or sell their labour in neighbouring Costa Rica outside the farming season. Therefore, it is the women in these communities who play an important role in community development projects, and the adoption of new approaches and technologies. For this project, ASODECOMAT managed to engage 293 women and 49 men, including 141 indigenous community members.

### **Beyond Project Impact: Replication, Up-scaling and Policy Influence**

The sustainability of the project is enhanced by the capacity of 15 community members to build and maintain the energy efficient stoves. This project is a replication of a similar project carried out in three other communities in the area. The CBO has widely shared the technology with other nearby communities as well, including through an annual SGP Knowledge Fair in 2013. With support of SGP, the NGO PROLEÑA compiled a technical publication evaluating different cook-stove models, including the CETA Modified cook stove.

### **Contribution towards National and Global Environmental Benefits**

The technology enables communities to lower firewood consumption and therefore reduce deforestation. In Nicaragua, excessive use of firewood is a serious issue for the environment. SGP Nicaragua has thus placed great emphasis on helping to improve environmental conditions in the dry areas such as Apante Hill by supporting energy efficient cook stove projects and by establishing energy forests for sustainable firewood supply. The government has also acted on the serious deforestation issue and launched a National Strategy for Firewood and Charcoal (2011-2012). SGP Nicaragua is one of the government's partners to support the implementation of the strategy.



CETA modified cook stove

### **The role of SGP and its Partners**

SGP successfully mobilized co-financing from HIVOS in the Netherlands, who funded 85% of the total cost of the project. In addition, through its partnerships with the Technical University in Valencia, Spain and a local NGO, SGP provided technical expertise for the construction of the energy efficient stoves. The Ministry of the Environment and Natural Resources (MARENA) provided training for the project participants in environmental protection for protected areas. Furthermore, the National Forest Institute (INAFOR) provided technical assistance for the planting of energy forests while the Council of Protestant Churches of Nicaragua (CEPAD), a national NGO, advised ASODECOMAT on the administration of the project finances.

### **Challenges**

The prices of building materials turned out to be significantly higher than initially projected due to fluctuations in the currency, so ASODECOMAT and stove recipients had to contribute the investment which was had originally been intended for a revolving fund. Thus, the intended revolving fund to further spread the technology and increase access to the eco-stoves was not established. In addition, adoption of the new

cook stove technology needs support from local, municipal laws. Increased public pressure could motivate lawmakers.

### Lessons learned

The approach applied in the project focused on the reduction of firewood consumption in five communities. Specifically, the project introduced the communities to new forms of sustainable forest management and awareness that eco-system degradation also damages livelihoods and people's health.

The eco-stove technology can easily be transferred and replicated throughout the country. In Nicaragua, the majority of the rural population uses stoves that need firewood. More and more information is now available about the damage to health and the environment from traditional cook stoves and demand for efficient stoves is rising from the communities. Adequate financial access and legislative support can speed up the process of diffusing energy efficient stoves. In addition, the CBO found that the best way to transfer technology is through building the capacity of community groups to construct these cook stoves themselves, so more people can gain access to the technology through their peers.

### Testimonials

"[The project] has helped me to use less firewood and protect the environment, planting trees for firewood. I feel the change, I feel more protected with my children because the smoke goes out of the house " –Ms. Isabel Hernandez, project participant, Susuli, Matagalpa.

"[The project] helped those households that lacked cook stoves, to save more firewood and reduce time preparing food. It is also possible to keep our kitchens more clean without danger of burning ourselves. "- Ms. Reyna Rizo, Piedra Colorada

