

# Empowering Women One Community at a Time

**SGP** The GEF  
Small Grants  
Programme



## THE MEKHE SOLAR COOKER PROJECT

### Project Description

The project aims to create a model for the sustainable use of renewable energy and regeneration of plant resources. The overall goal is to preserve vegetation through reforestation and the use of solar energy as an alternative to firewood. The project's Technical Advisor, Mr. Abdoulaye Toure, built and introduced the first solar cooker in Senegal in 1990.

The success of this model, as demonstrated in over 50 villages in Senegal, Mauritania and Burkina Faso, led to a partnership among the ecovillage of Ngaye, SGP, CRESP NGO and GEN Senegal (the first African national ecovillage network that seeks to improve and protect its 45-member village, striving for sustainability). This project encourages women of Ndiop to take advantage of the solar cookers as an alternative to firewood and to lead in effort to preserve vegetation.

### Background

The successive droughts of the 1970s and 1980s, in addition to population growth, led populations of fragile areas like Mekhe to rely heavily on natural resources for firewood, charcoal and livestock survival (e.g., cattle breeding), thereby causing deforestation and forest degradation. According to a survey done in 2003 by the research team from the Centre for Resources for the Emergence of Social Participation (CRESP), consumption of firewood per family results in four hectares of deforestation annually. Due to poverty, 85% of the energy used for cooking comes primarily from wood. The use of wood for cooking not only causes environmental damage, but also has health implications, specifically chronic respiratory problems.

The Senegalese government, together with development partners including UNDP and UNEP, began a series of national and regional initiatives for the sustainable management of the Sahelian ecosystem. This policy is based on an approach that integrates many sectors under the responsibility of the local population.

Mekhe is situated 130 km from Dakar and has a population of 15,291. It consists of 1,699 households divided into 1,241 compounds. There



Implementing Organization: Ndiop Women's Association

Location: Mekhe Village, Thies Region, Senegal

SGP Contribution: US\$ 49,808

In-cash cofinancing: US\$ 34,567

In-kind cofinancing:

US\$ 826 (Centre de Ressources pour l'Emergence Sociale Participative, CRESP and Réseau des Ecovillages du Sénégal, GEN SEN)

Number of Beneficiaries: 107 direct women beneficiaries and 1,700 indirect beneficiaries overall

Duration: October 2004 – September 2006

Awards and Recognition:

The neighborhood of Ndiop is now registered as an 'ecovillage', a member of the Senegal Ecovillage Network and Global Ecovillage Network (GEN)

is a slight predominance of women (8,181) over men (7,101). For this reason, the solar cooker initiative was conceived in the area as the target actors were primarily women.

## Implementation

Project implementation relied on the availability, willingness, participation and commitment of its members, particularly women. The problems were clearly identified: deforestation, use of inappropriate energy sources (as financial difficulties make it difficult to access other sources), and insufficient capacity to make informed decisions.

Abdoulaye Toure introduced the concept of the solar cooker to the community. The model uses materials produced locally. Villagers were trained to produce the cooker, enabling availability and access, and guaranteeing ownership and sustainability. There were also efforts to build capacity for the promotion and marketing of solar cookers.

To empower women, 10 women were trained to use the solar cooker and five were trained as trainers; the project also identified 30 local recipes that can be easily prepared with the cooker. This capacity



building exercise allowed the women to be better prepared to use and promote this technology. Multiple uses of the ovens allowed households to save money and to improve cooking conditions: no smoke and less time in the kitchen. With a monitoring system in place, project leaders provided guidance and assistance to maintain the solar cooker.

During project implementation, women were also involved in tree planting and community reforestation, which paved the way for the creation of the Centre for Women's Development of Tivaouane. These activities were replicated.

The success of this project was due to the following activities:

- Raising awareness about the use and promotion of renewable sources
- Manufacture and marketing of solar cookers
- Establishment of a nursery
- Regeneration of vegetation by reforestation
- Capacity building of grassroots actors
- Cost-benefit analysis of the use of the solar cooker vs. use of coal and firewood
- Establishment of a micro-credit scheme to finance activities of women

## Environmental Impact

In August 2006, a mid-term survey was conducted with the first group of 44 families that had received the solar ovens on May. The evaluation survey asked families to recall the amounts of different fuel sources that they had used before they received their ovens and to report the amounts of these same fuels that they still were using, in addition to their ovens.

The evaluation found that each family's cooker saved an average 3 metric tones (MT) of equivalent carbon dioxide (CO<sub>2</sub>e), which is the equivalent to 12 trees per year. The first green tags sold by this project in the informal voluntary carbon market enabled the construction of 10 additional solar cookers.

The second survey conducted in April 2007 included reliable data from the first 44 families and a second group of 49 families who received their ovens between August 2006 and April 2007.

In this assessment, given the imperfect quality and incomplete use of the early ovens, the calculation was extremely conservative and was based on the assumption that each oven received only one year of use on average (although, in fact, a well constructed and managed oven lasts for eight years).

The assessment concluded that there was an annual median emissions saving of 4 MT per oven. However, if each oven lasts for at least two years, the amount would be 8 MT per oven.

In addition, the community reforestation programme established a nursery with the support of the local technical forestry service. 3,132 forest trees and 719 fruit trees were planted.

## Socio-Economic Impact

Those who use solar cookers are families who do not have access to government subsidized butane gas, those who live in rural areas, or those who do not have enough money to purchase butane.

The use of solar cookers saved the women time from gathering firewood from the forest. It also decreased physical labour, reduced health risks caused by smoke exposure, and generated additional income through the sale of baked goods and other food products.

The solar cooker project created 10 jobs, built the capacity of 105 women and 22 men, and placed 30 facilitators; 700 people, including two government ministers, visited the site.

## Policy Impact

The Minister of Biofuels, Renewable Energy and Scientific Research visited the project and briefed the President during a meeting of the Council of Ministers. The President instructed the Minister to mobilize resources to make the solar cooker project a platform for the research, production and use of solar energy.

SGP had a meeting with the Ministry to discuss integration and replication at the national level. The Department of Renewable Energies sponsored two training workshops in Diourbel and Sédhiou to build and use solar cookers.

In a particularly noteworthy development, a member of the board of the Women's Association became a town councilor.

## Gender Equality and Women's Empowerment

Women's empowerment and intervention were manifest in:

- Promotion of women-led entrepreneurship
- Promotion of solar cookers in households
- Promotion of solar energy as an alternative to firewood and reduction of tree cutting
- Preservation of the environment by planting trees
- Training in the use and maintenance of the solar cookers

## Sustainability

Capacity building proved to be an important component, ensuring sustainability of the project. 260 artisans were trained in the construction of the solar cookers while 300 women were trained in the use of this technology. In partnership with the Miami Country Day School, there was an exchange of knowledge to test the solar bakery. To spread knowledge and ensure institutional memory, the following were developed:



Making crafts and producing additional income with the time saved by using the solar cooker.

- A manual on solar cookers, in partnership with the University of Aval
- A DVD movie (in French and English), Women and Climate Change: The Solar Oven, A Priority for Sustainable Management of Forest Resources in the Sahel
- An article, "Solar Cooking to Improve the Environment", in Women & Environments International Magazine, No. 74/75, Spring/Summer 2007, pp. 15-17

## Replication and Upscaling

There were two training workshops with support from the Ministry of Renewable Energies to build and use the solar cookers in Diourbel and Sédhiou. Furthermore, the project is being replicated in eight other communities in the country.

## Lessons Learned

The biggest challenges that the project faced from project inception were the introduction and acceptance of this technology among a marginalized and illiterate group of women. Thus, awareness raising and education were crucial components of this project. It was also necessary to demonstrate the benefits (e.g., fewer health risks, greater income, improved well-being of women) that the project would bring.

Technical and financial barriers were the major challenges that the group encountered. To overcome technical barriers and to ensure community control over prices, local carpenters were trained to produce the first ovens.

One of the initial experiences revealed that the quality of the first ovens was sub-standard. After the mid-term project evaluation, only 30 of the original 44 solar cookers were still operational, as 14 had malfunctioned due to wear and tear and construction weaknesses. Thus, it was necessary to retrain the carpenters to ensure the durability of the ovens.

As a result, training in and evaluation of the use of these ovens have improved local construction. To lower financial barriers to the purchase of the solar cooker, each unit was sold on an installment plan at a cost of US\$60 over 15 months. As the total manufacturing cost at the time was US\$ 100, the project provided a US\$ 40 subsidy for each oven.



## Contribution to the MDGs



- Increased alternative sources of income for women of the Mekhe village
- Cost reduction, as solar cookers are cheaper than firewood



- Women spearheaded the project and are the main implementing organization
- Women were trained to use solar cookers and to share knowledge with other members of the community
- Inclusion of a woman member from the Women's Association in the town council



- Reduction of about 187,390 kg in use of fuel wood over the past three years
- Reduction of 47,000 kg of CO2 emissions annually
- Decrease in pressure on forests for firewood



# Community Action Global Impact

The GEF Small Grants Programme  
 220 E 42nd Street, 21st Floor  
 New York, NY 10017  
 Phone: +1 (646) 781-4353 | Fax: +1 (212) 906-6568  
 Email: [sgp.info@undp.org](mailto:sgp.info@undp.org) | Website: [www.sgp.undp.org](http://www.sgp.undp.org)