

# Findings

Africa Region . Number 122 . March 2006

Good Practice  
Infobrief



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## Senegal: Sustainable and Participatory Energy

*The Sustainable and Participatory Energy Management project - PROGEDE (IDA \$ 5.2 million; DGIS \$8.8 million; GEF \$4.7 million) was implemented by the government between 1997 and 2004. From project preparation to supervision the World Bank worked in close collaboration with Dutch Co-operation (DGIS). At the time of project preparation, forest-based traditional fuels (firewood and charcoal), mainly used for household cooking purposes, represented 53% of Senegal's final energy consumption, and 76% of charcoal consumption was in the principal urban areas. Over the years, the operation of the charcoal industry had resulted in (i) the gradual loss of forest cover (approximately 30,000 ha per year) and thus of the ecosystem's carbon sequestration capacity and biodiversity; (ii) the degradation of the rural environment (particularly soils); (iii) the impoverishment of the rural areas; (iv) an acceleration of rural exodus; and, (v) a massive transfer of wealth from the rural communities to a few urban-based woodfuel traders.*

The project focused on (i) supply side management activities through the implementation and monitoring of 300,000 hectares of environmentally sustainable community-managed forest resource systems in the Tambacounda and Kolda regions of Senegal, forming in the process a managed protection zone around the Niokolo-Koba National Park («International Biosphere Reserve»); (ii) demand side management activities in the form of promoting private sector inter-fuel substitution and private sector and NGO-based improved stoves initiative; and (iii) capacity development activities to strengthen the institutions involved in the management of the sector, and the promotion of the participation of civil society in the operation of the sector.

### Impact on the ground

· **The Preparatory and Support Activities Component** resulted in the following main outputs:

- a. A comprehensive vegetation cover assessment and inventory was carried out of the Tambacounda and Kolda regions.
- b. Monitoring and evaluation systems related to project implementation were set up.
- c. Capacity building programs and field extension guides were prepared for participating regional Forest Services offices and staff, as well as for community groups and NGOs.
- d. Detailed implementation plans were prepared for the Demand Management and Inter-Fuel Substitution Options component, including the identification of private sector and NGO initiatives to be supported by the project.

- **The Sustainable Woodfuels Supply Management Component** directly benefited some 250,000 people – equivalent to approximately 21% of the population in the Tambacounda and Kolda regions – and an estimated 100,000 urban charcoal-consuming families. It achieved the following outcomes and outputs:
  - a. Sustainable community-managed forest systems were established over an area of 378,161 ha, with a supplying capacity of more than 370, 596 tons per year of sustainable fuelwood, equivalent to some 67,400 tons of charcoal per year.
  - b. A community-managed buffer zone was created around the Niokolo-Koba National Park.
  - c. Participating rural communities and NGOs implemented participatory management modules and produced and marketed woodfuels and multiple other non-wood products.
  - d. Community-base micro enterprises were established including beneficiary-operated improved carbonization units, apiculture cooperatives, collective ( women ) and individual agricultural diversification units/systems; livestock and poultry-raising, arts and crafts units, etc.
  - e. Established a sustainable income generation base (wood and non-wood products) of about \$12.5 million per year, equivalent to a \$40,000 average per participating village.
  - f. Some 20% of Senegal’s current energy supplies are now derived effectively from renewable resources in the form of sustainable woodfuels.
  
- **The Demand Management and Inter-Fuel Substitutions Options Component** directly benefited some 250,000 families (30%) in the principal urban and peri-urban areas of the country. It also benefited several hundred urban-based traders including charcoal wholesalers, charcoal retailers and stove artisans. It achieved the following outcomes and outputs:
  - a. The urban charcoal trade was partially reorganized and modernized to establish long-term supply agreements ( contracts ) between rural communities and urban traders.
  - b. Interested charcoal traders were assisted to diversify their economic activities.
  - c. Technical and market feasibility studies were carried out to validate the further promotion of kerosene and LPG and the introduction of “Millennium Gelfuel” as substitute household cooking fuels.
  - d. Inter-fuel (kerosene and LPG ) substitution was supported as was distribution of improved stoves by the private sector and the NGO community.
  - The government added several other key initiatives including:
    - a. Establishment of a permanent energy sector digital database and monitoring and information system; and
    - b. Concept design and establishment of urban and peri-urban “energy boutiques” to increase access to high efficiency and quality household fuels and equipment.
  - The project funded : training for new stove producers to increase in-country stove production capacity; consumer awareness and improved stoves promotion to increase market penetration and use; a sustainable financial intermediation system which would enable certified new stove producers to set up production facilities and operate until they could capitalize themselves and qualify for regular commercial banking loans.
  - The Forest Service was substantially transformed from a «para-military law enforcer agency» with extremely limited transparency and accountability to a technical assistance and capacity development agency with a participatory vocation and significantly improved governance.
  - There has been revitalization and strengthening of traditional social institutions and of their natural management resource roles and responsibilities. This was done by changing resource tenure rights within the project zone and supporting the re-orientation of existing economic activities and/or introducing new ones.
  - The project recognized and promoted the role of women within the village structures and this resulted in the empowerment and revitalization of women’s groups and associations.
  - Charcoal traders within the project zone have gone from being “enemies” of the rural communities to becoming commercial partners – legal contracts have helped make this change.
  - A targeted communication/information strategy helped to raise consumer awareness on energy efficiency and resulted in widespread public support for sector reforms.
  - The 317 villages involved experienced far-reaching changes in terms of their knowledge base and capacity, awareness of rights and responsibilities and a clear sense of self-reliance to achieve their own developmental expectations.

## **Main Lessons Learned**

- The project demonstrated that the production and marketing of traditional biomass fuels can not only be stabilized, while arresting deforestation and contributing to ecological conservation, but that it can become a highly effective social and economic rural development strategy.
- The stabilization of the traditional energy sector essentially depends on the implementation of comprehensive changes in the woodfuels' supply system and chains. While demand management are important and need to be pursued – especially dissemination of improved end-use technologies and practices – that alone cannot resolve the existing problems.
- The establishment of environmentally and socially sustainable woodfuel supply systems can only be achieved through the introduction of integrated community-based forestry and natural resources management schemes. Governments lack the financial resources, the manpower and the incentive to do this; the private sector is not interested because of the long payback period, inherent risks and low profit margins.
- A minimum policy platform is required. This includes: (i) clear and legally enforceable forest resource and land tenure rights and responsibilities; (ii) a transparent decentralized fiscal and taxation system ; (iii) a clear and fair pricing system; and (iv) guaranteed access for woodfuel producers to final consumer markets.
- Specific investments in women's activities (vegetable gardens, apiculture, micro-credit, etc. ) result in the most significant and tangible poverty alleviation, especially in terms of health, nutrition and education of the beneficiary population, especially children.
- A CDD approach using well-targeted capacity development, organizational and institutional development support and investment financing directly to rural communities proved that absorption capacity is not an issue.
- The establishment of a sustainable income base and the generation of a productive demand for energy has made the 317 project zone villages prime candidates for rural electrification and increased access to other modern energy services. Without these elements, long-term and unsustainable subsidies become a dominant feature.

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