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energy projects

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Niger Household Energy Project

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Introduction

Promising initial results from the Niger household energy project suggest that an integrated program of taxation and land tenure reform can bring about sustainable management of fuelwood resources. Although it is too early to draw firm conclusions about the optimal strategies for technical management of the natural forest, the project has mobilized significant political and grass-roots support, and the approach appears promising for Sahelian and other countries where fuelwood supply is critical. Similar projects are currently being designed for Chad, Senegal, and Burkina Faso and are at Board stage for Mali and Guinea. Other countries (Malawi and Mozambique) and other organizations (FAO) have expressed interest in replicating the project.

Pre-Project Situation

Landlocked in the Sahel, Niger is one of the world's 20 least-developed countries. The total population was 8.2 million in 1992, and the urban population (about 900,000) is increasing rapidly. Fuelwood, used by 99% of households, is the major source of energy. In many areas, fuelwood consumption greatly exceeds the rate of natural regeneration, depleting the natural forest and degrading the soils.

Before the inception of the project, access was open to all forested areas, and fuelwood was "mined" in an anarchic manner. This uncontrolled exploitation was most severe around urban areas, mainly because neither the forested land nor the wood itself belonged to the fuelwood collectors. Moreover, attempts to recover the environmental cost of the harvested wood from fuelwood traders had not been very successful.

The Project

Objectives

The project has two key objectives:

- to restructure the fuelwood sector around the main urban centers so that the supply of fuelwood is managed rationally and the environment is protected; and
- to encourage conservation of fuelwood by promoting the use of improved stoves and substitute fuels and by establishing economic pricing of fuelwood.

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Design

The project, financed by DANIDA and managed by the Industry and Energy Division of the Bank's Sahel Department, began in 1989 and has been divided into two phases: Phase I ran from 1989 to 1994; Phase II runs from 1995 to 1999, consolidates and expands the program, and requires further involvement of villages.

Criteria for Success

Success of the project depends on some key features:

- *the two-pronged approach used:* This involves measures to improve the supply of fuelwood on the one hand and measures to reduce the demand for fuelwood on the other; this aproach is unique among household energy projects;
- *the crucial role played by a large number of individuals.* The project depends on voluntary popular participation and decisionmaking;
- *monitoring and evaluation.* These are integral to the project. Data are collected on all aspects and results are disseminated regularly and acted upon; and
- *the links between the government departments of energy and the environment.* Moreover, the project requires the government to reduce its traditional, dominant role.

Supply-Side Measures

Facilitating Village Management

The project introduces an innovative approach to sustainable management of the fuelwood sector, transferring responsibility for the forest areas directly to the rural communities. The forest around a village is transferred to a village management committee under a 60-year franchise from the government. The village elects a management committee, which is responsible for the daily management of the forest. In Phase II, participating villages develop their own forest management plans with the help of consultants hired by them. The plans are subject to the approval of the forestry service. The fuelwood harvested from the area is sold to commercial transporters at a rural market at a price determined by the villagers. The commercial transporters pay tax at the rural market, and then, to enter an urban area, they must pass through a government-run post that controls the payment of the tax. Urban consumers thus pay the price of fuelwood (determined at the rural market) plus transportation costs, the transportation/distribution mark-up, and the tax. The introduction of the tax is progressive, such that, by 1999, the price of fuelwood will equal its economic value.

Promoting Rural Markets

Ideally, all forested areas around the urban centers will be controlled through rural markets. The markets will only be established when a village wants to participate and an agreed management plan is drawn up. Each market will have an annual fuelwood quota based on the sustainable production capacity of the village's natural forest.

Discouraging Uncontrolled Areas

To discourage the cutting of fuelwood from uncontrolled forest areas, the tax paid at the control post by transporters of wood from uncontrolled areas is higher than the tax plus the fuelwood cost at the rural markets.

Applying a Taxation System

Taxation levels depend on the origin of the fuelwood and decrease with distance from the city so that transporters are encouraged to buy from rural markets furthest away from the urban centers. Tax receipts are split among the villages, central treasury and local government; ultimately these receipts will cover all project costs.

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Establishing Tax Posts

Control posts were established on all the main urban access routes, and mobile controls were introduced to help counteract tax evasion. Penalties are imposed on transporters who avoid paying tax.

Problem Solving

In Phase I of the project, two main problems – a low rate of tax collection and a lower-than-anticipated amount of fuelwood coming from the new rural markets – were encountered and to some extent resolved.

Countering Low Rates of Tax Collection: The low tax collection on wood from uncontrolled areas stemmed both from evasion by transporters and from neglect of duties or embezzlement by control post operators. Mobile teams have now been established to control secondary roads, and the quality of personnel at the control posts has been improved. In addition, an incentive system for tax collectors has been introduced whereby the tax collector receives 10% of the tax collected. Supervision of personnel will also be improved, and penalties will be imposed for evasion. Before the project, only some 10% of the fuelwood taxation was levied and collected. By early 1994, this had increased to 40%, and the new control measures have resulted in further increases in tax compliance.

Enlarging the Rural Markets: During Phase I, the majority of fuelwood for urban consumption still came from uncontrolled areas. Some 50 rural markets were established during this phase, comprising a managed forest area of about 150,000 hectares, that provides 10% of the fuelwood market. However, a large increase in rural markets, with a consequent decrease of uncontrolled forest land, is still needed. In Phase II, approximately 350 rural markets will be established, and the tax on fuelwood from uncontrolled areas will be increased substantially, so that fuelwood from controlled areas will be cheaper than fuelwood from uncontrolled areas.

Demand-Side Measures

The second thrust of the project is to reduce the demand for fuelwood by promoting the use of improved woodstoves and by using modern fuels with new equipment. Research was undertaken worldwide to identify the most appropriate kerosene cooking equipment, and in Niger promotional activities were undertaken to increase public awareness of the equipment available.

Disseminating Improved Woodstoves

Through the project, metalsmiths in Niger have been trained in the manufacture of improved woodstoves for several years and can now produce them in several sizes. Improved woodstoves allow fuelwood savings of between 20% and 30% in relation to the traditional "three stone" stove, although actual savings are only 7%, due to inefficient consumer behavior. The project runs demonstrations to assist the trade in sensitizing consumers to cooking with fuelwood more economically.

Promoting the Kerosene Stove

After a careful selection process, the Tchip stove, originally from Indonesia, was identified as the most appropriate kerosene stove, because it provides the best match for local cooking needs and its capital and operational costs are cheaper than alternative stoves considered. Capital costs are still high, however, and an initial subsidy was directed to help defray these costs. Both types of stove are being promoted in the media and through demonstrations to emphasize their best use; they are also being supported by a private sector after-sale service throughout the city.

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Problem Solving

Uptake of new technology was slow in Phase I. This was caused by distribution problems, political turmoil, an economic downturn, and the low price of fuelwood. A particular problem was that imports of the Tchip stoves were delayed, resulting in stock shortages at distribution outlets. In Phase II, the Tchip stoves are to be produced locally, and this, combined with improved management and continued emphasis on marketing and promotion, should speed the uptake of the new technology. Fuelwood was still cheap relative to its substitutes even before the recent devaluation of the FCFA. The fuelwood tax is intended to ensure that the full economic value of fuelwood is reflected in its price, thus creating an equal playing field for all household fuels.

Key Lessons

To date, lessons learned relate mainly to the process of establishing the project rather than to its impact on forestry resources; that will take more time to evaluate. However, a technical report on the early results of natural forest management efforts indicates that the initial impact on forest conservation is positive.

Project is Cheap to Finance

The project is relatively cheap and can ultimately be self-financing. Total project costs are $7 million and should result in the sustainable management of 500,000 hectares of natural forest. The project could be self-financing within five years; during Phase II, 40% of the project costs will be met by tax receipts.

Popular Participation is Vital

Ownership of the project by the people is essential for the project's success. This is achieved by involving local participants in many features of the project. Villagers are encouraged to take an active role in the sustained production of forested areas by being given rights over the land. The project also provides basic literacy and accounting training, and villagers have responsibility for settling any disputes concerning ownership rights to the forested areas.

Villagers Must Have Land Tenure

Villagers must have effective and absolute long-term rights over land, exclusive rights for woodcutting, and sole responsibility for forestry management.

Government Must Create Enabling Environment

The project requires government support embodied in new, transparent regulations, review and approval of plans, and provision of funds and technical assistance. The government thus creates an enabling environment, but commercial decisions are left to private economic agents.

Benefits Must be Clear

Villagers want to form rural markets only when it is clear that it is profitable for them to do so. The project therefore also requires appropriate levels of taxes and fines; price increases of fuelwood that are sufficiently gradual to be acceptable to consumers; and institutional capabilities for the enforcement of tax collection and penalties for avoidance.

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