

# FUELWOOD RURAL MARKETS OF THE SAHEL

With funding from the World Bank, the Republic of Niger undertook the reorganization of the fuelwood supply of its main towns.

Wood and currency movements, as well as their impact on the economy of the villages and the management of woody formations, make up the « fuelwood » sector, representing a very important element of the country's forestry policy.

## FUELWOOD

### ENORMOUS DOMESTIC ENERGY REQUIREMENTS

Surveys were conducted along the main roads leading to Niamey, as well as on the markets and in homes, for over a year (BERTRAND, 1991). They showed that this town depended on wood for 95 % of its domestic energy supplies, representing about 150,000 tonnes or 500,000 steres per year.

The wood, after having been split and resold several times, is finally delivered to consumers in very small piles of 50 or 100 F CFA\*, providing a living for an entire chain of dealers, from the haulers, some of which have annual turnovers of several million F CFA, to the old women or children involved in reselling. Thus, a stère costs about 6,000 F CFA; so that 500,000 steres, the annual consumption of the town of Niamey, represent 3 billion F CFA\*\*.

\* 100 F CFA = 1 French franc = 0.2 US.\$.

There is a similar situation in most African countries. In Garoua, for example, a town of 140,000 inhabitants in North Cameroon, wood consumption has been estimated at 100,000 t/year representing 1.5 billion F CFA in 1992 (PELTIER *et al.*, 1993). The big modern towns of the Gulf of Guinea are no exception and use enormous amounts of fuelwood generally transformed into charcoal.

### EXTENSIVE SUPPLY BASINS

The same surveys also made it possible to locate the harvesting sites within a radius of 150 km around Niamey, as well as the main transport routes (see figure, p. 77). It is found that most of the wood comes from a basin of 40,000 sq.km. The tarpaved southern (hence always practicable) route handles about half of the flows because it covers the less populated zones, which still have forests that are not highly degraded and are more productive owing to better rainfall (Projet Energie II, V.O., 1991)\*\*\*. However, the harvest is still significant, although very diffuse, north of the Niger river in quite densely populated farmlands (DETHIER, 1992).

\*\* About 6 million US.\$.

\*\*\* Financed by the Kingdom of Denmark and executed by the World Bank, Projet Energie II falls under both the Ministry of Mines and Energy and the Ministry of Hydraulics and Environment of Niger. Technical assistance has been provided since 1990 by the S.E.E.D./CIRAD-Forêt group under the coordination of G. MADON and A. BERTRAND.

### A STILL ABUNDANT FOREST RESOURCE

The inventory of natural formations (tiger and spotted Combretaceae bushlands) was conducted within a circle of 150 km radius around Niamey (BURILLON *et al.*, 1990). On 2.4 million hectares there is a stock of wood (marketable stems larger than 4 cm in diameter) of 3.5 million tonnes. It grows annually by about 300,000 tonnes, without counting fallows and trees disseminated in rural areas, thus covering largely the requirements of the town and the country.

Unfortunately, the resource has been poorly used. Until recently, cutting was carried out by teams of city workers, transported to the forest in lorries of the hauling companies which returned to the town with the wood and the workers at day's end.

Cutting was thus concentrated around Niamey and along the permanently practicable routes, to reduce the cost of transporting this heavy and cumbersome product. Villagers participate only marginally in this process, selling some bundles on the roadside (BERTRAND, 1992).

### This system results in two problems :

- The maintenance of a poor wood-cutter class, often consisting of villagers coming to town in search of income, in particular in the dry season, and who could find only uncertain employment, insecurity, illness



and no possibility of saving money or evolving socially.

- The degradation of the environment, over-logged in large areas, leading to a loss of biodiversity, non-reversible erosion of soils and loss of forest, agricultural and grazing potential. The under-logged zones were not much better protected ; they in fact were at the mercy of uncontrolled clearing, including surface soils on which farmers were able to obtain one or two harvests of millet before abandoning an eroded soil covered with lean tufts of *Guiera senegalensis* (BA MAMADOU, 1991).

#### FARMLAND MANAGEMENT BY VILLAGERS

The designers of Projet Energie II estimated that it was necessary to return to the villagers the management of the bushlands located on their territory, for the following reasons :

- **silvicultural** : in order to better distribute the logging pressure over all the formations ;
- **macro-economic and social** : to diversify the income of the rural world and limit the exodus which destroys the social fabric ;
- **political** : to restore to the villagers their legitimate rights to all of their farmlands and contribute to peace between different human groups ;
- **patrimonial and ecological** : to preserve the future of the country by conserving the soils, the ecosystems and their biodiversity.

### FOR A POLICY CHANGE...

#### STRENGTHEN THE ADMINISTRATION

Without being argumentative in any way, it is possible to estimate that a good part of Niger's Water and Forest Administration has become de-

motivated in recent years. As a result of the successive failures of several large-scale reforestation or management projects for the natural forests (FRIES, 1990), and due to a lack of financial resources, many employees confined themselves to the collection of taxes on wood along the roadside.

The set up of villager forest management, on the other hand, calls for the strong involvement of the administration in the field, in a role of coordination and not only of repression.

It can thus be understood that it is necessary to re-instill in the employees a faith in the forest policy, to provide additional training (which was made possible by the Project) and to identify the means of operating in the long term (which is what the tax system should allow, besides the Project itself).

#### ENCOURAGE THE EMERGENCE OF FUELWOOD PRODUCER GROUPS

The Project began its work at a time when the major cooperative-creation policy began to show its weaknesses. It was necessary to conceive more flexible and better suited structures capable of allowing the management of village forests. These were called « rural markets ». These groups were put into place only at the explicit request of the volunteering village ; there was consequently no imposed technocratic creation, having a small chance of survival. The rural markets include an elected president, a manager and representatives of breeders, farmers and, of course, woodcutters. The management structures are « custom-designed » for each village (MADON *et* BERTRAND, 1994).

Managers had to be given additional training.

#### MODIFY THE RURAL CODE

The rural code was modified (very slightly, moreover) to allow the creation of rural markets and to assign to these groups the management of village forests under the designation of « rural concessions ».

#### CHANGE THE TAX SYSTEM

As the keystone of the forest policy, the tax system allows a reduction in taxes on wood coming from managed zones, according to the distance from the town : See Table 1 (ALAGBADA, 1991). The wood from managed formations, located over 80 km from Niamey, thus becomes cheaper than that harvested anarchically on the periphery of the town, thus compensating slightly for the extra cost of transport and contributing to a better distribution of logging pressure over the entire region (BERTRAND and MADON, 1993).

### ...AND FOREST MANAGEMENT REFORM

#### DISTRIBUTE EARNINGS FAIRLY

At the present time, only about 50 rural markets have been created but the Project has gone into cruising speed and most of the forests of the Niamey region should be under management within the coming five years.

This will then yield income to be shared by the villagers and the local administrations (PELTIER, LAWALI and MONTAGNE, 1995).

The following simple calculation will illustrate the possible revenues :

Out of the 500,000 steres consumed by the town of Niamey, about 1,300 F CFA per stère should return to the rural markets (see Table 2, p.88), representing over 600 million F CFA of which 15 million would go to the state, 40 to the



**Table 1. Tax levied per stere of wood paid by rural markets (RM) according to the distance (d) from the consumption centre**

(Decree No 92-279, Prime Minister/Ministry of Hydraulics and Environment, of 21 August 1992), articles 1 and 4

	Bonus per RM Category			
	Base	1st d < 40 km + 0 %	2nd 40 < d < 80 km - 10 %	3rd d > 80 km - 20 %
Oriented RMs (yellow coupons)	375	375	337.5	300
Controlled RMs (management, blue coupons)	350	350	315	280
Uncontrolled zone (red coupons)			600 F	

local communities, 60 devoted to forest management works, 150 would allow development actions in the villages, and the remaining 400 million would be shared by the village woodcutters.

### INTEGRATE FOREST PRODUCTION INTO CUSTOMARY LAW\*

The delimitation of the plots of the forest formation, the management of which has been assigned to village groups, was negotiated at length between the different interest groups within the village and between neighbouring villages. The Project coordinators based themselves substantially on customary authorities and on ancestral rights. In the Fulani sub-dominance zone, where Projet Energie II began, several rights on the lands are superposed and do not apply to the same surface areas (MAMANE IBRAHIM, 1990).

As grazing and gathering of various kinds are compatible with the recommended forest management (ACHARD, 1990), it was not deemed necessary to upset these rights. On the other hand, the most basic right and the one best delimited geographically is the right to clear the forest and to grow crops ; the customary chiefs hold this right by heritage and assign it temporarily to farmers against the payment of a title\*\* (a tenth of the millet bags). After having explained how it is to the advantage of the villagers to produce and sell wood durably, they generally accepted to devote the lands covered with forest to a silvo-pastoral management scheme excluding any clearing, at least on the surface soils of low-productivity plateaus for agriculture. Those who had rights over more space than could be worked by their administered subjects accepted to negotiate forest management with neighbouring villages. Although not official, a system of small symbolic gifts was probably set up, proving that the

chiefs still maintain part of their power over these lands. Wood production was thus assimilated, from the customary law viewpoint, with the production of millet : by basing a modern law on an ancestral law, chances of being assimilated and accepted were improved.

### FROM FOREST MANAGEMENT TO FARMLAND MANAGEMENT

The Project and the forest administration, as well as several « fuelwood rural markets », wished to have a management plan including a map and a very simple plot arrangement. This makes it possible to pinpoint the zone being thinned in the year x by the village y and thus be able to control unauthorized cutting, in particular by outside woodcutters. Moreover, the delimitation of plots makes it possible to better distribute cutting within the village forest, to group the operators in order to limit accidents and theft, and to consider certain silvicultural activities. Villagers have thus become accustomed to a certain planning of their forest work.

In addition, as we saw earlier, the sale of wood has allowed the creation of funds for village development actions. This can be used to finance the renovation of the school, the dis-

\* The customary law is the unwritten law which governs the functioning of rural society by the permanent adaptation of customary rules derived from tradition. It is distinguished from traditional law which expresses the rules of tradition conceived as intangible and definitively set.

\*\* This very old law has been made illegal in recent decades by the Nigerian state. It is however still used.



**Table 2. Calculation of taxes levied on a stere of 1,000 F CFA in a controlled rural market of category 2.****Case of Tientiergou**

Retail price in town about hauler 6,000 F/stere	Price paid by 1,315 F/stere all taxes included	Taxes 315 F	10 % = 31.5 F to the state	31.5 F – State
			60 % = 75.6 F, other allocations	75.6 F – Communities
			40 % = 126 F to the community	40 % = 50.4 F, management maintenance
			50 % = 157.5 F to the local management structure	40 % = 63 F, forest investment fund
				60 % = 94,5 F, other village allocations
			200 F village treasury (reimbursement of advances and then various allocations)	113, 4 F – Forest
			100 F to the manager	294,5 F – Village
			Price per stere 1,000 F exclusive of taxes	
			350 F, advance to woodcutter upon delivery to rural market	800 F – Private people in village

pensary, the place of worship, public facilities (track roads, wells), sales stores for agricultural or breeding, but also antierosion arrangements, reforestation, etc.

Finally, forest management had to encompass the animal farming aspects. Until recent years, forest managers considered traditional grazing incompatible with sustained forest production. Ecological studies of "tiger bush" and "spotted bush" have shown that the hydrological functioning of these ecosystems was related to the existence of herbivorous animals and hence quite compatible with grazing (SEGHERI *et al.*, 1994). For this reason, grazing was authorized in forest management

schemes but with some discipline (a few months of prohibition after the cutting of a plot).

So that there is a gradual transition from forest management to overall management of village lands, the essential part of this evolution consisting of income from the sale of wood.

## WHAT LESSONS MAY BE DRAWN FROM PROJET ENERGIE II ?

### FOR FOREST MANAGERS

In the years from 1970 to 1990, many forest operators wished to stop disorderly logging by isolating

vast forest formations from their human environment. They limited them by means of landmarks and firebreaks and have opened a « heringbone » track road network in order to allow the movement of production to consumption centres. However, most of these management schemes existed only on paper and had to be discontinued because it was impossible to limit the incursions of woodcutters and livestock on the periphery ; also, controlled logging of wood was too costly.

On the contrary, experience with village management schemes in Niger suggests the idea of allowing each village to manage the portion of for-



est on which it has traditional rights, where its livestock grazes and where its villagers do their gathering.

The conception of the management of a forest formation is no longer oriented towards its centre but towards its periphery ; this hence modifies completely the entire plot arrangement, the network of track roads and, of course, the staffing and control system.

### FOR FOREST RESEARCHERS

Some years ago, researchers who advised forest managers wished to « restore » the ecosystems, in the sense of ARONSON *et al.* (1993), by bringing them as close as possible to their original condition. To accomplish this, they wanted to exclude the new disturbing element represented by man. They appeared to forget that it was man with the help of iron, fire and his livestock, who modified not only the biodiversity but also the hydrological and climatic processes profoundly and long ago (several thousand years). In many cases, little is known about what would happen exactly to these formations if such important parameters as grazing, fire and gathering should be modified.

The management provisions of *Projet Energie II* are limited to the « rehabilitation » of the ecosystem, i.e. bringing it back gradually to a structure and a production suitable for man. For this purpose, it has been considered preferable to modify only very little the rules for logging\* (by giving minimum diameters) and grazing (by prohibiting grazing only during a few months).

### FOR FOREST ADMINISTRATION

Most African forest administrations are not only responsible for management, but own the natural spaces (private domain of the state). This represents enormous power on the majority of the lands in these countries. In fact, owing to a lack of staffing and resources, they are unable to control logging, agricultural clearing, grazing and hunting.

On the other hand, the example of *Projet Energie II* shows that by legitimizing the customary laws and by entrusting the right to manage to populations living near the forest and who go through it every day, the administration can obtain the large-scale application of its production and environmental protection objectives, while ensuring its own operation through the collection of taxes.

## CONCLUSION

Wood, as a renewable energy source, is very important in the supply of African towns and will certainly continue to be so for many years to come, in particular in the Franc CFA zone, after the relative doubling of imported fossil fuel prices following the devaluation of 1994.

The example of fuelwood rural markets in Niger shows clearly that an appropriate combination of technical, legislative, tax reform and institutional innovations can make it pos-

sible to cover the fuelwood requirements of the towns, while increasing rural revenues and allowing better conservation of what exists. The flow of income from the towns to rural areas should in fact allow the financing, on the one hand, of sustainable forest developments which reconcile wood production and biodiversity conservation but, also, the overall management of village farmlands, including their agricultural and grazing components. Through fuelwood, economically one of the most important (and most visible) products of the rural world, the forest represents a source of rural revenues rapidly becoming a prime mover of local development self-managed by villagers. This is particularly important in a peri-urban Sahelian zone because there are not many other new possibilities of financial income capable of motivating the village groups. In fact, revenues from agriculture and breeding are above all a means of daily survival. Of course, in other regions, this prime moving role can be played by different agricultural revenues (grouped sales of cotton, coffee, cacao, etc.), grazing or cottage industries, and even by the salaries of expatriates.

It is thus particularly necessary for forest officials to be able to conceive a new type of management taking into the account the functioning of ecosystems, national wood requirements, increasingly active commercial collection, the interests and the rights of the rural population and the evolution of the administrative and political structures of the countries involved. □

*For bibliography, see the French version.*

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\* As regards logging rules, what has been recommended is the return to the coppice selection system, which is in fact the customary method, and the abandonment of clear cutting techniques previously recommended by forestry specialists and researchers.