

# A Review of the Rural Firewood Market Strategy in West Africa

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## Abstract

The rural firewood markets are a major step forward in Sahelian natural resource management. After decades of failed, or highly disappointing, forestry projects and programs, the rural market concept has opened a new way forward and created possibilities for a wide variety of initiatives. In empowering local people, putting responsibility for local resource management with those who stand to gain, or lose, most from it, the markets are also making a significant contribution to the overall processes of decentralization and democratization taking place in the Sahelian countries.

There are, nevertheless, important questions and issues which still need to be addressed. These are matters of major concern to policy-makers, governments seeking to balance the many internal and external pressures upon them, and the major donor agencies who, alone, can provide the funding for large scale development initiatives in the poorest countries.

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# **A REVIEW OF THE RURAL FIREWOOD MARKET STRATEGY IN WEST AFRICA**

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Paul Kerkhof  
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## **CURRENCY EQUIVALENTS**

US\$1 = 710 FCFA

(April 2001)

## **UNITS OF MEASURE**

Firewood quantities in the field are usually measured in steres. A stere is a stacked cubic metre of cut wood. The weight per stere depends primarily on the density with which the wood is stacked which, in turn, depends on its size and straightness.

Measurements show a variation from around 225 kg/stere for small wood up to 350 kg/stere for large wood. The commonly adopted average figure of 300 kg/stere is used in this report.

## **ABBREVIATIONS**

BTPN	Brigade Territoriale pour la Protection de la Nature
CCL	Cellule Combustibles Ligneux (Mali)
GDP	Gross Domestic Product
GEF	Global Environment Facility
ha	hectare
ILO	International Labour Office
mm/yr	millimetres per year (rainfall)
NEF	Near East Foundation
NGO	Non-Governmental Organization
SDA	Schema Directeur d'Approvisionnement
UNEP	United Nations Environment Programme



## INTRODUCTION

The World Bank-Government of Niger Household Energy Project was implemented during the period 1989-1996.<sup>1</sup> During this time, the concept of the rural firewood market was developed and put in place in Niger. The promising early results from the project prompted its replication by the World Bank in Mali and by a number of other agencies in Mali, Niger and other Sahelian countries

This report reviews the performance and the impact of firewood market system in Niger and Mali, in so far as it can be assessed, since the end of the World Bank support for the Niger programme in 1996. It also draws upon a review of local forest management in the Sahel carried out by Paul Kerkhof for SOS Sahel during the period 1996-99.<sup>2</sup>

Experience with the rural firewood market concept, as a tool for rural development and environmental management, is still limited. Ten years is not a long time in the perspective of long-term natural forest management. It is sufficiently long, however, for certain important institutional and financial lessons to be drawn.

Chapter 1 provides some broad contextual information on Niger and Mali. Chapter 2 describes the design and implementation the Niger Household Energy Project. Chapter 3 describes the Mali Domestic Energy Project which quickly followed the Niger project and was closely modelled on it. This chapter also provides a comparison of the key features in the two projects as well as some outline descriptions of other rural firewood market projects.

The following five chapters look in more detail at key aspects of the rural firewood market experience to date. The final chapter endeavours to bring the various threads of the discussion together and draw some conclusions.

Field work was carried out by Paul Kerkhof and Djibrilla Madougou in Niger and Mali during March-May 2001. Thanks are due to the project staff in Mali and Niger who kindly made their time and information available to the evaluation, and to the staff from a host of institutions indirectly related to the firewood markets who also contributed generously. The authors are also grateful for comments on an earlier draft of the report from Alain Bertrand and Pierre Montagne, Gérard Madon, and Robert van der Plas.

This final English-language version of the report was prepared by Paul Kerkhof and Gerald Foley.

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<sup>1</sup> A full description of the project is contained in *The Niger Household Energy Project, World Bank Technical Paper No 362 (April 1997)*

<sup>2</sup> *Local Forest Management in the Sahel: towards a new social contract, Paul Kerkhof (ed G.Foley), SOS Sahel, London (2000).*



## I. NIGER AND MALI BACKGROUND

Niger and Mali are two large sparsely populated neighbouring Sahelian countries. Both are landlocked, though Mali has a rail connection from its capital Bamako to Dakar in Senegal. They are both completely dependent on imports for their petroleum fuel supplies. Woodfuel provides the vast bulk of their cooking energy needs.

### A. NIGER

Niger had an estimated population of 10.8 million people in the year 2000. The population growth rate is about 3.5 percent. About one quarter of the population is urban, with Niamey, the capital and largest city, having about 800,000 inhabitants; it has been doubling in size every twelve years.

Economic growth rates per head have been zero or negative in recent years. Income per head, in 1996, was US\$200. Niger is among the poorest countries in the world, a fact that shows up clearly in quality of life indicators. Life expectancy is 47 years, infant mortality is 119 per 1000 live births and only about 30 percent of the children go to primary school.

Administratively the country is divided into Departements, Arrondissements, and Cantons. The last are headed by traditional chiefs.

Firewood is universally used for cooking and there is little use of charcoal or other fuels. It is estimated that the total consumption of firewood in Niamey is about 700,000 steres, roughly 210,000 tonnes, per year.

#### *Ecology and climate*

Niger has a total area of 1,267,000 square kilometres. It can be divided into three climatic and natural resource zones. The north, which occupies about three quarters of the country, is mainly Sahara desert but, moving southwards, this fringes into an extremely arid and sparsely vegetated Sahelo-Saharan type of ecology. It is an area of plateaus and mountains with negligible rainfall and little human habitation.

The central part of the country, which occupies about 13 percent of the total area, lies in the north Sahelian climatic zone. The rainfall varies from about 200 mm/yr in the north to 350 mm/yr in the south but is highly variable and irregular. The natural vegetation is a light bushy savanna. Soils are generally thin and light especially on the plateaus. Rain-fed agriculture is possible in the valleys and lowland plains where the soils are deeper but is always subject to risk from the irregular rainfall.

About 90 percent of the population live in the southern part of the country, which covers the remaining 12 percent of the land area. This region has a rainfall which ranges from 350 mm/yr in the north to 800 mm/yr in the south. Over most of the area, the natural vegetation is savanna woodland dominated by combretum species. It is only in the extreme south, especially the southwest, where the rainfall is at its highest, that there are areas of well-wooded Sudanian savanna forest.

Much of the country's natural woodland occurs in the form of curved strips or patches of vegetation interspersed with hard bare impervious soil. The rather striped appearance of these woodlands from the air has led to the nickname of "tiger bush". There are also substantial acacia formations in the temporary river beds and lake areas, especially in the east of the country.

In all, there are about 13 million ha of woodland in the country, about 10 percent of the total land area. Of the total wooded area, however, about 9 million ha are marginal woodland, with a cover of less than 5 percent. It is only the remaining 4 million ha, about 3 percent of the land area, which has a woodland cover of more than 5 percent. The total area of gazetted forest in the country is 600,000 ha but, of this, a substantial proportion has almost completely disappeared.

### *Land ownership and rights*

Land ownership, almost everywhere outside the urban areas, is governed by traditional laws which rest fundamentally on occupation and use. Each village is surrounded by an area of land, the limits of which are well known to the villagers and over which the village chief has certain rights. It is the chief, for example, who grants a family permission to clear an area for farming in return for which they pay a fee, usually a portion of their harvest, to him. Once the land has been cleared, the family has certain ownership rights over it and it can usually be passed on to descendants. Conflicts over land ownership or usufruct are common. According to some surveys, 20-40 percent of all rural families are involved in some conflict or another.

Uncultivated woodlands have traditionally been open to all for grazing, fuelwood and pole collection, the gathering of fruit, herbs and other products, and hunting. The colonization of the country, however, introduced the European notion of the "forest" as an entity, a reserve of wood and wildlife, separated from the agricultural and pastoral lands. Under the colonial system, the state became the absolute owner of all wooded areas which were then formally designated as gazetted forests.

In a decree introduced in 1935, the state, in addition to the gazetted forests, also attributed to itself all vacant woodland areas which it designated as the "protected forest domain." The role of the forest service was to patrol and guard the gazetted forests and the protected forest domain against the local population. Even trees on agricultural land became subject to control by the forest service. This has been, ever since, a potent source of discord between foresters and villagers.

### *The forest service*

The forest service in Niger dates from the 1930s. Through the decades since then it has been changed many times in accordance with the prevailing politics, preoccupations and forestry policies in vogue. Since 1992, forestry activities are coordinated by the Environment Directorate of the Ministry of Environment and Hydrology.

There are about 400 forestry staff of whom 60 percent are decentralized postings and 25 percent are working on projects. Many of the forestry projects carried out in the country with donor assistance have been implemented by specially constituted project teams. This can bring major problems of sustainability if the project teams are disbanded after the end of the funding period. The forest service is extremely short of finances and material resources of all kinds. Salaries are low and their payment is often delayed.

The forest service is a paramilitary organization, organized on military lines, with powers to arrest, fine and confiscate. All forest agents are entitled to a percentage of fines imposed, sales of confiscations, and taxes collected. In the case of fines, 25 percent goes to the forest service, of which a proportion goes to the agent concerned with the remainder distributed to the various levels in the service. The forest agents who collect taxes take a commission of 10 percent on the amounts handed to the tax office. This system of providing forest service agents with a direct return from fines and taxes means they have a vested interest in maximising the amounts collected, particularly given the poor levels and delays in payments of salaries.

A key division of the forest service is the BTPN (Brigade territoriale pour la protection de la nature) or Forest Brigade. This is the central unit responsible for forest protection and control, the most active and repressive functions of the forest service. One of the key functions of the BTPN is the administration of the firewood cutting permit system and the inspection and control of firewood transport. Taxes levied on transporters constitute an important part of the revenues collected by the BTPN, and hence, of the amounts of money paid to forest agents. Also important are the fees issued for firewood cutting in areas not controlled by firewood markets. This constitutes a significant disincentive for the BTPN to narrow their own revenue base by promoting the spread of rural firewood markets.

## **B. MALI**

The population of Mali is estimated at 10.2 million, almost the same as that of Niger. The population growth rate is about 2.2 percent. About 30 percent of the population is urban. Bamako, the capital and largest city, has a population of about one million.

Following a popular revolution in 1991, a range of governmental reforms and democratization initiatives were introduced. The most important reform is political decentralization under which Communes, which comprise about ten villages, have a democratically elected Council and Mayor. The intention is that the communes will increasingly take over responsibility for natural woodland management from the forest service.

Since the political reforms in 1991, the economic performance of the country has improved. GDP growth during the period 1997-99 averaged 5.5 percent, over twice the estimated rate of population increase but the country remains, with Niger, among the poorest in the world. Life expectancy is 58 years and about 54 percent of children go to primary school.

Unlike Niger, the use of charcoal for cooking is common and rising rapidly in the urban areas of Mali as people switch from firewood. Charcoal is a much more convenient, though more expensive, fuel than firewood and its increasing use is an indicator of rising incomes in the urban areas. It is estimated that its use is growing at about 20 percent per year and it now accounts for about half the cooking fuel consumption of Bamako.

The total woodfuel consumption in Bamako, taking into account of the quantity of wood required to make charcoal, has reportedly grown from 600,000 tonnes in 1994 to 1,200,000 tonnes in 2000. Even if this is an overestimate, it is clear that the amount of wood required to meet the cooking fuel needs of Bamako is growing rapidly.

### *Ecology and climate*

The total area of Mali is 1.24 million square kilometres. The northern 25 percent of the country lies almost entirely within the Sahara desert and is virtually unpopulated.

South of this lies the Sahelo-Saharan zone within which the rainfall is low and patchy. Rain-fed agriculture is impossible and the vegetation consists of a light scattering of low thorny shrubs and bushes. Some recessional agriculture is practiced along the River Niger which loops through this zone. This and the Saharan zone account for about 60 percent of the land area but only about 5 percent of the population live within them.

Moving south, the next ecological zone is the Sahelian which covers about 20 percent of the country. The rainfall varies from an unreliable 300 mm per year in the north of the zone to a more reliable 700 mm in the south. People live mainly by pastoralism in the north, with an increasing proportion practising agriculture towards the south.

The southern 20 percent of the country is in the Sudanian zone with rainfall ranging from 700 mm per year in the north to 1,500 mm per year in the extreme south. In the north of this area, the natural vegetation is an open woodland which gradually becomes denser and richer towards the south.

This is an area of settled farming and is where the bulk of the population live. Bamako, on the river Niger, is positioned in its centre. Segou, the second largest city is to its north; Sikasso, near the border with Burkina-Faso is in the south; and Kayes, on the river Senegal, lies to the west. This is also the area in which the tsetse fly is found and trypanosomiasis, sleeping sickness, has historically been a major constraint to the agricultural development of the zone.

### *Land ownership and rights*

Land ownership in the rural areas is, to a major extent, determined by traditional rules. The situation is quite similar to Niger, but the traditional chiefs tend to be weaker. When Mali became an independent state, the state tried to replace the traditional chiefs by modern systems of governance. It partly succeeded in doing so, but traditional chiefs still play an essential role in many villages.

The land ownership structure in Mali is more complex than in Niger due to the more varied ecology. Traditional patterns, similar to those in Niger, are largely followed in the drier areas. The rich inland delta of the Niger river is partly governed by the traditions of the Peuhl herders, under rules which date from the kingdoms of the 19th century.

The high forest cover areas in the southern part of the country which have largely remained unused because of the prevalence of trypanosomiasis are now being colonized and converted to growing commercial agricultural crops such as cotton. Traditional land ownership rules tend to be weaker in this zone.

Under colonialism, certain areas were reserved as gazetted forest in which many of the traditional rights of local users were abrogated. A system of cutting permits was imposed for commercial wood production and local people found outsiders cutting their forests. Once Mali became independent, the state appropriated all land with the result that, legally, rural people became users of land and natural resources instead of owners. Farmers also lost their

farming rights over lands which had not been cultivated for five years. Later, the state imposed restrictions on the use of trees on farmland and the type of cooking stove to be used and introduced a host of other rules.

The political reforms introduced in 1991 reversed the tendency towards central control. Farmers regained control over the trees on their land even where no cultivation had been carried out for up to ten years, though certain species such as *Faidherbia albida* remain protected.

### *The forest service*

As in Niger, the Malian forest service was established by the colonial government in the 1930s. The main concern at the time was the production of firewood for the railways leading to Dakar and for steamers on the Niger River. When Mali became independent in the 1960s, the government, in accordance with its socialist principles, asserted state ownership of all natural resources.

The forest service was given responsibility for protection of all forest resources, including even trees on cropland, as well as the control and taxation of commercial wood production and transport. These powers were widely abused and rural people suffered a high level of repression by forest service agents. One of the results was an increasing level of animosity towards the service on the part of local people.

During the political revolution of 1991 much of the popular wrath was aimed at forest agents, some of whom were killed or seriously injured. After the revolution, the forest services were effectively abolished as an independent government department. Forest agents were transferred to a rural development ministry. Forest control issues, for example, were allocated to a unit whose responsibilities included seed quality control and animal health measures.

In 1998, a significant proportion of the old forest service was recreated as the Nature Conservation Department in the Ministry of the Environment. The basis of the service was, however, significantly changed making it difficult for a regression to the old repressive ways to take place. The introduction of the rural firewood markets in 1995 and the Communes in 1999 have radically changed the former framework of forestry legislation.

## **II. THE NIGER HOUSEHOLD ENERGY PROJECT**

The World Bank Group first became involved in forestry and woodfuel work in Niger in 1978. In that year, it launched a forestry project, referred to as the IDA/FAC/CCCE project (for the initials of the collaborating groups – the Bank Group's International Development Association and the French development assistance agencies *Fonds d'Aide et de Coopération* (FAC) and *Caisse Centrale de Coopération Economique*). The first detailed survey of the country's fuelwood supply system was carried out in 1984 within the framework of this project.

The survey provided a range of new data for woodfuel planners and showed that fuelwood provided virtually all the cooking fuel used by families in both the urban and the rural areas. Under traditional woodfuel supply arrangements in Niger, urban fuelwood traders have been legally obliged to obtain a cutting permit from the forest service specifying a permitted quantity of fuelwood and the location from which it may be taken. The fuelwood

traders then dispatch teams of woodcutters into the countryside. These woodcutters are entitled to take the allocated quantity of wood from the natural woodlands with little or no consideration for the sustainability of supply.

Villagers in the areas where the woods are being harvested have no power to regulate the cutting and receive no benefit from it. Nor, because of lack of resources, is the forest service able to exercise effective control over how much wood is taken or where it is obtained. The quantities specified in the cutting permit are, effectively, ignored.

Against this background, and a variety of supply-demand projections showing alarming woodfuel supply deficits emerging in the future, the Household Energy Project<sup>3</sup> was designed by a joint Government of Niger-World Bank team working in Niger in 1986. It consisted of two components. The Supply Component dealt primarily with natural forest management and the firewood markets. The Demand Component, which is not discussed here, included the promotion of improved firewood stoves and the design and promotion of locally suitable kerosene cooking stoves.

#### **A. THE RURAL FIREWOOD MARKET CONCEPT**

The Supply Component design team developed the concept of a rural firewood market as the centrepiece of its strategy. Under this, a local community is given formal control over its own area of natural woodland and exclusive rights to the sale of all the firewood produced from it. In return, the village signs an agreement to manage the woodland sustainably. The programme was launched in 1989 with the support of a US\$10.3 million grant, later increased to US\$12.3 million, from the Danish Government.

Detailed surveys of the fuelwood supply chain, from the urban consumer back to the source of supply in the rural areas, were begun. Inventories of the natural woodland resources around Niamey and the other major urban areas were carried out. The process of drawing up the necessary changes to the land tenure and taxation legislation required for the establishment of the rural firewood markets was set in motion.

As data became available, fuelwood supply master plans or SDAs (Schema Directeur d'Approvisionnement) were drawn up for the supply of firewood to Niamey, and the next largest towns, Zinder and Maradi. The plans divided the firewood catchment area into "decision grids" showing, for the different parts of each catchment area, the standing stock of wood, the potential sustainable annual yield, the estimated amount of firewood consumed locally and the amount that could be sustainably supplied to the city. Sociological studies added information on economic and social conditions in different areas.

Master plans were drawn up to provide a planning basis for the supply of firewood to each urban area. These master plans highlighted the areas where the surveys and sustainable yield calculations showed natural woodlands were already being over-exploited and firewood harvesting should be discouraged. They also identified areas where firewood resources were still plentiful and setting up rural markets should be a priority. The estimated annual sustainable yields were used as the basis for drawing up an allowable firewood harvesting quota for each market.

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<sup>3</sup> The Household Energy Project is widely referred to as Energie II which is a wider World Bank energy project of which the Household Energy Project is a component.

## **B. PROJECT ADMINISTRATIVE AND LEGAL FRAMEWORK**

Overall monitoring and supervision of the project were carried out by the World Bank. Technical support services for the project were put out to tender and the winning bid was by a French joint venture team composed of SEED and CIRAD-Forêt.<sup>4</sup> A resident expatriate technical advisor was attached to the project for a total of six years with back-up services provided as requested by the project management and agreed with the Technical Assistance Coordinator in France.

The Supply Component of the project was under the control of the Department of the Environment in Niger. It was divided into four units each headed by a chief. These units were "Control" which was in charge of the fuelwood transport control system; "Fuelwood Supply Chain" which carried out studies into the fuelwood supply chains to the urban areas; "Forest Management" which provided technical support in setting up rural fuelwood markets and developing their management plans; and "Promotion and Sociology" which was responsible for the establishment and initial working of rural markets. All of this represented a heavy commitment of administrative resources by the Niger Government and forest service to the project.

Draft proposals for the establishment of rural firewood markets were published by the project at the end of 1989. These were discussed in a series of seminars and meetings involving representatives of all the relevant parties over a period of two years. The final proposals were then put to the government. This led to the drafting of legislation and the publication of Government Order No 92-037 in August 1992 which came into effect in March 1993.

This Order stated that a "rural market" is a place of firewood sale where an organized local management body exists. This local management organization must be approved by the Department of the Environment for the purpose of commercial firewood supply to the main urban areas. The rural market is supplied from a zone of woodland agreed between the local management organization and the Department of the Environment. The task of the local management organization is to exploit, guard, manage and ensure the regeneration of the agreed area of natural woodland supplying the market.

The rural market is authorised to collect tax on the firewood sold. This is a highly significant step. Granting the rural market entity the authority to collect taxes gives it an official recognition and status which is both practically and symbolically important in its dealings with firewood traders and the forest service. Many forest agents found this unacceptable, as illustrated by one participant at the workshop which introduced the markets: 'When did we ever see rural people managing their own woodlands? What will the role of the forest services be? That idea, we are going to fight it'.

The Order states that, from the date of its coming into force, only approved rural markets and the owners of private forests are entitled to supply commercial firewood. For a transition period, which will be ended by decree of the Minister, the exploitation of commercial firewood from uncontrolled areas remains permissible. It also states that a quota, defining the quantity of firewood which may be harvested each year, will be set for each delimited area of natural woodland associated with a rural market.

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<sup>4</sup> SEED is a consulting company based in Paris. CIRADForêt is the French national centre for international cooperation in forestry and agricultural research and was formerly known as the CTFT.

The Order makes a distinction between two types of market, the directed and the controlled. In the directed market, the area of natural forest is delimited and agreed and an annual harvesting quota is set but no formal management plan is agreed. A controlled market is one where a detailed management plan, specifying the division of the forest area into parcels, the order of their harvesting, the annual harvesting quota, and the forest management measures, has been agreed between the local management committee and the Department of the Environment.

**C. THE TAXATION PROVISIONS**

In addition to defining the legal framework for the project, Order 92-037 set out a radically new set of taxation provisions for the firewood market system. Under this, the firewood cutting permit was abolished and, instead, the transport of cut firewood to the towns became subject to tax.

Only licensed professionals are allowed to transport firewood. Instead of a cutting permit, traders must obtain the appropriate transport coupons, issued by the forest service, which specify the amount of firewood carried and whether it comes from a rural market or an area of uncontrolled open woodland. The rural market coupons, in turn, distinguish between whether the wood comes from a directed or a controlled market.

The intention was to provide a financial incentive to firewood traders to differentiate between the rural markets and uncontrolled zones as sources of supply and, among the markets, to encourage the controlled over the directed. In addition, the coupons specify the distance of the zone relative to the urban area from which the firewood has been obtained; the intention here was to encourage dealers to obtain their supplies from further away, where forest resources are less heavily exploited than those close to the urban areas. Each coupon is valid for one trip taking place within 48 hours of its issue. The structure of the taxes is shown in Table 2.1 below.

**Table 2.1 Structure of fuelwood taxes established in 1992 (FCFA/stere)**

Distance from urban area	Rural markets		Uncontrolled zones
	Directed	Controlled	
less than 40 km	350	375	600
40-80 km	315	340	600
beyond 80 km	280	300	600

Each transporter, on entry into a town, is obliged to present the appropriate coupon at the firewood control post or at any other time when requested. The coupon acts as a receipt for the payment of the appropriate tax on the amount of firewood being carried. In the case of a rural firewood market, the tax is collected by the market manager at the time the firewood is being purchased. When the firewood is obtained from an uncontrolled zone, the tax is paid in advance at a Department of the Environment coupon-issuing office.

Order No 92-037 also specifies the division of firewood tax receipts between the national treasury, the local authority, and the rural market and how this varies depending on the fuelwood source. The relevant figures are shown in Table 2.2 below.



**Table 2.2 Division of taxes levied on fuelwood transport**

	Uncontrolled area	Directed area	Controlled area
Rural market	-	30 percent	50 percent
Local authority	10 percent	20 percent	40 percent
National treasury	90 percent	50 percent	10 percent

The Order also specifies the way in which the rural market and the local authorities are allowed to spend their share of the tax receipts, as shown in Table 2.3 below. As can be seen, the proportion available to the village for discretionary spending is higher in controlled market villages than in those with a directed market.

**Table 2.3 Authorised expenditure of tax revenues**

	Type of rural market			
	Directed		Controlled	
	Woodland management	Discretionary	Woodland management	Discretionary
Rural market village	60 percent	40 percent	40 percent	60 percent
Local authority	60 percent	40 percent	40 percent	60 percent

The actual level of the various taxes at any particular time is determined by government regulation. Order No 92-037 states that these tax rates should be revised at least once a year and at any time if necessary. These revisions are supposed to take into account the rate of inflation, the evolution of other fuel prices and any other relevant economic, social or environmental factors. In practice, revisions are rare and the taxes remain well below the levels anticipated at the launch of the project.

#### *Forest management funds*

A belief in the need for active forest management in the Sahel is deeply rooted in forest service and donor agency attitudes. The taxation regulations make explicit provision for the allocation of funds to two types of forest management initiatives.

The Village Forest Management Fund is, in principle, under the control of the village authorities. The proportion of tax revenues available to the village for investment in woodland management measures, as shown in Table 2.3, varies between the directed and controlled markets, with a higher discretionary element being allowed in the case of controlled markets. Investments by the village in woodland management measures are subject to approval by the forest service.

The District Forest Management Fund is under the direct control of the local authority. In effect, the local forest service determines how such funds are expended.

#### **D. PROJECT IMPLEMENTATION**

In achieving the handing over of control of natural woodland management to village communities, the Household Energy Project introduced major institutional change in the country. One of the institutions most affected was the forest service whose policing role in detecting, punishing and preventing violations of the forest code diminished in proportion as the project managed to achieve its objectives.

The establishment of a rural market gave village people exclusive control over their own woodlands. The forest service no longer had the right to exclude them from this area or influence how they behaved, provided they remained within the framework of the management agreement they had signed. Rather than being in confrontation with villages, forest wardens were now expected to ensure that others, whether fuelwood traders or woodcutters from other villages, respected the rights of the local population. In addition, forest officers were expected to advise, not command, villagers on matters of tree growing and woodland management. The project therefore imposed a heavy burden on forest officers – one that their training and expertise had not prepared them to carry.

##### *Delimiting the village forest area*

One of the most crucial steps in the establishment of a rural firewood market is delimiting the area of forest over which the village has control. This is an extremely complex issue as the area of land "belonging" to a village is a result of historical population movements, inter-ethnic conflicts, colonial interventions and a variety of other factors.

The project accepted that it was not practicable to use the introduction of rural markets as an occasion for attempting to impose a more equitable distribution of land rights between villages. Such a task was far beyond its abilities and resources. Neither could the project take upon itself the task of defining the "ownership" of the different areas of land over which various customary rights were exercised or claimed. It was therefore decided to restrict the establishment of rural firewood markets to villages which could show they had undisputed firewood harvesting rights to the woodlands around them or were able to secure agreements on such rights with neighboring villages without any pressure or intervention by the project or the government.

At first, the project allowed itself to be involved in these discussions but this proved impracticably complex and time-consuming. Instead, it was decided that the discussions should be undertaken by representatives of the various villages themselves in conjunction with the local canton chief. Once agreement had been reached, an official from the Department of the Environment could be invited to visit the defined area with the village representatives concerned and record it officially. Agreed landmarks were then located using the Global Positioning Satellite (GPS) and recorded on a map.

##### *Establishment of the rural firewood markets*

At the end of 1995, a year before termination of the scheduled funding period, a total of 85 markets were in operation. Of these, 60 were in the Niamey firewood catchment area, 14 in the Zinder catchment and 11 in the Maradi catchment. Total turnover through the markets was estimated to be FCFA 100 million (about US\$200,000) and fuelwood sales to Niamey through the markets were estimated to be about 16 percent of the city's consumption.

At the beginning of the project, when the initial promotion of the rural markets was getting under way, there was a high degree of distrust on the part of villagers. Many were unable to believe that a real transfer of control over their village woodlands was being offered to them or that they would truly be given discretion over the spending of funds. Much of this distrust had been overcome by 1995 and there appeared to be a growing momentum in the formation of rural markets. In some areas, without any intervention by the project, villages were spontaneously applying to have a market.

It was also being found that a number of villages adjacent to functioning markets, again without any intervention by the project, had begun to refuse access to firewood dealers while they are waiting for the establishment of their own market. In one area, a number of markets were discovered to have banded together to harmonise their prices and prevent themselves being played off, one against another, by firewood dealers.

The project also introduced a new dynamic into pattern of fuelwood harvesting throughout the fuelwood catchment area. As the first firewood markets were set up, traders moved to other areas for uncontrolled firewood production. The project then moved into these areas of exploitation in order to set up further markets, whereupon the traders responded by moving to yet other unexploited zones. The longer-term implications of this dispersion of fuelwood harvesting over a wider area will be an interesting subject for further research and analysis.

#### **E. POSITION AT END OF FIRST PHASE**

The progress made by the end of 1995, when funding for the first phase of the Household Energy Project was, therefore, reasonably promising. A substantial number of markets had been established and they seemed to be functioning satisfactorily. Inspired by this success, the model was adopted in whole or in part by a number of development organizations and NGOs, including the *Caisse Française de Développement*, GTZ, the Lutheran World Foundation, and CARE.

Further markets continued to be set up, with the total reaching 120 in 1997. Some of these, however, turned out to short-lived or were prematurely reported as being functional and the number actually operational at the end of 1999 appeared to be 102, of which 73 were supplying Niamey.

Various weaknesses were also emerging. The up-dating of SDAs requires considerably greater financial and technical resources than were available in Niger. As a result, the original SDAs, which were prepared in the beginning of the 1990s and were becoming increasingly out of date, could not be revised. Moreover, the legal position of the markets themselves was fragile; none had obtained the formal certificate of official recognition – the *Agrément*. This has continued to be the case and even by mid 2001, none of the markets was in possession of the formal certificate.

Collection rates for firewood taxes were extremely low before the project, averaging about 15 percent in 1988. As a result of the major efforts made by the project, the collection rates increased to an average of 47 percent during the years 1989-93. But this had fallen to about 10 percent in 1999.

Growing political instability in the country was also leading to hesitation in the donor community about the provision of further funding for the rural firewood market model in

Niger. Although the Household Energy Project received some bridging funds from Danida after 1996, which enabled it to continue at a reduced scale, it no longer played the role of a major catalyst of change in the western Sahelian region.

#### **F. SECOND PHASE OF THE HOUSEHOLD ENERGY PROJECT**

A second phase of the Niger Household Energy Project was launched in the year 2000 with support from Danida. It deals solely with the supply component. The major aims of the second phase are to increase the number of markets from about 75 in 2000 to 172 by 2004; to simplify forest management procedures and to increase the efficiency of the tax system. The Danish funding amounts to 22.8 million DKK (about US\$2.6 million) for the first three years and a total of 32 million DKK (about US\$3.6 million) for the scheduled five-year duration of the project.

In contrast with the first phase, the establishment of the markets has been contracted out to a private company rather than being the responsibility of the forest service. The intention is to improve performance and reduce bureaucracy in setting up the markets. The company involved was nominated in the project document so no private sector competition is involved.

Reform of the taxation system is also planned. The intention is that the tax on firewood from uncontrolled zones should increase by a third in 2001, from 975 FCFA/stere to 1,300 FCFA/stere. The effectiveness of tax collection is expected to increase from perhaps 15 percent in 2000 to 80 percent by the end of the phase. The project, however, does not propose significant innovations in the tax system so that it is not at all clear how, or whether, this will be achieved.

In 2001, the African Development Fund provided lending for a project similar to the Household Energy Project so that the two projects are now working side by side. The project budget is 6 billion FCFA (8.5 million USD) and the first phase is expected to last 5 years.

### **III. RURAL FUELWOOD MARKETS IN MALI AND ELSEWHERE**

The promising progress made in developing and implementing the rural fuelwood market concept in Niger during the late 1980s and early 1990s led to its rapid replication in Mali and elsewhere. This chapter looks especially at the experience in Mali.

#### **A. THE MALI DOMESTIC ENERGY PROJECT**

The political reform and decentralization process, which began in Mali in 1991, created a conducive environment for a rural fuelwood market initiative. Preparation of the Mali Domestic Energy Project began in 1991 and it was finally approved and launched in 1996 and ran until December 2000.

The project closely replicated the Niger Household Energy Project, with the World Bank being responsible for its financial management. It had a total budget of US\$5.5 million over four years of which the GEF contributed US\$2.5 million and the Netherlands government contributed the greater part of the remaining US\$3 million. A bridging fund was

made available by the Netherlands Government in April 2001, in anticipation of a proposal for a second phase.

The project, as in Niger, was divided into two components, Supply and Demand, of which only the Supply Component is considered here. A special project unit for the Supply Component was created, first under the Ministry of Rural Development, later under the Ministry of the Environment. The project structure responsible for the Supply Component in Mali is called the CCL (Cellule Combustibles Ligneux).

#### *Use of private operators*

In contrast with Niger, a major role was allocated to the private sector in the establishment of the markets. This was intended to streamline the process of market establishment which the Niger experience had shown was extremely slow when the forest service acted as the implementing agency.

The project encouraged the setting up of small private consulting companies whose task is to establish rural firewood markets in particular areas. These private sector operators are often ex-government staff, many from the forest service itself. The companies are often described as NGOs but are more in the nature of small private profit-making enterprises. The important point, in strategic terms, is that, whatever they are called, an entirely new group of organizations outside government has been established in order to support the rural firewood market programme.

The private operators differ in two important ways from government services. They are much more flexible since they do not have to operate within the government hierarchy and rules but, instead, have to respond effectively and efficiently to market forces; nor can they afford, financially, to employ inefficient or corrupt staff. Instead, they have a real incentive to search actively for innovations and improved efficiency in achieving the goals set out in the contract with their client. They are also more or less independent politically from the government and are potentially more responsive to the needs of the rural firewood markets and the communities around them.

The project has established an elaborate set of criteria for the selection of private operators as well as performance indicators during the contract and four different stages of evaluation which allow payment of contracted sums. The private operator is responsible for all activities under the contract including transport. As a rule, each contract aims at setting up five new markets; the establishment of the market is only contractually completed when official recognition has been obtained and the markets are fully functioning.

A typical contract with a private operator is in the region of 6-10 million FCFA and covers the establishment of five markets over a period of 3-6 months. During the period 1997-2000, a total of 50, out of the 54 rural firewood markets established under the Domestic Energy Project, were put in place by 14 private operators.

## **B. IMPLEMENTING THE PROJECT**

The first step in implementing the project, as in Niger, was to carry out a series of woodland inventories and other studies in the woodfuel catchment areas of the five major towns and cities. These formed the basis for the preparation, by the CCL, of a woodfuel

supply master plan (SDA) for each of these five areas. These SDAs were used as the planning basis for the establishment of the rural firewood markets and setting their annual allowable supply quotas.

### *Taxation provisions*

The firewood taxation system introduced in Mali in 1995 differs in a number of important respects from that in Niger. Originally, all firewood, whether it came from markets or uncontrolled areas, was taxed at the same rate. This was changed in 1995 when a differential of 400-550 FCFA per stere was introduced in favour of the markets. Unlike in Niger, the tax comes due in advance of sales, which can create major difficulties for market operators. Another difference is that a much greater proportion goes to the central government, as shown in Table 3.1 below.

**Table 3.1 Division of tax revenues from firewood markets in Niger /Mali in 2000.**

Type of market	Niger		Mali
	Directed	Controlled	All
Part of taxes retained by community	30 percent	50 percent	0
Part of taxes retained by local government	20 percent	40 percent	5-10 percent
Part of taxes retained by central government	50 percent	10 percent	Up to 95 percent

The intention in Mali is that a proportion of tax going to the central government will be invested in forest management projects. The proportion of total revenues to be invested in such projects will depend on whether the tax comes from uncontrolled areas, oriented markets or controlled markets. A higher allocation of investment funds for forest management will be made to market areas and is intended to act as an incentive to market operators. The breakdown of the intended distribution of tax revenues is given in Table 3.2.

**Table 3.2 Distribution of central government fuelwood tax revenues in Mali**

State	Distribution as a function of origin of the wood		
	Uncontrolled 60 percent	Oriented 35 percent	Controlled 15 percent
Forest Management	-	30 percent	45 percent
Forest Control	35 percent	15 percent	10 percent
Commune	-	5 percent	10 percent
Chamber of Agriculture	-	5 percent	10 percent
For the forest agents personally	5 percent	10 percent	10 percent

The modalities of such investments have, however, not yet been established and the funds remain uninvested. Some government officials feel that these funds should not be returned to the village forests, but should be invested in forests elsewhere. Irrespective of the final decision on this, it is clear that the Malian taxation policies are less attractive for the local markets than those in Niger.

Taxation of firewood obtained from uncontrolled areas, outside the firewood markets, is, in principle, an essential element in the government's overall fuelwood policy. Unless this wood from uncontrolled areas is effectively taxed, the firewood markets are inevitably at a

competitive disadvantage. Taxation of such firewood flows is, however, notoriously inefficient and the CCL has invested heavily in improved tax collection around Bamako, realising that this is crucial to the sustainability of the rural firewood markets.

In order to improve tax collection, a vehicle and 16 motorcycles were purchased, mobile telephones were added to the communication system, initial and further training courses were provided for personnel, and mobile control posts were created. A further 18 contract staff, paid from project funds, were added to the tax collection team. Despite these investments, the tax collection rates actually fell from an estimated 10 percent before the project to 9 percent in its final year.

### *Project achievements*

Data on actual project achievements in Mali are sketchy and somewhat contradictory. Part of the data problem is that a number of other firewood market projects (see section 3.4) are also running and integrated statistics have not been collected.

At the end of 1999, there were about 160 firewood markets in operation. Firewood sales are impossible to estimate accurately since in a significant number of cases the only figure available is the quota, without any indication of whether it is being fulfilled, not met, or exceeded. The best estimate is that about 14 percent of firewood sales to Bamako are coming from the markets.

### C. NIGER AND MALI COMPARED

The table below provides a summary comparison of the main features of the rural firewood market achievements in Niger and Mali.

INDICATOR	NIGER	MALI
<i>No of rural firewood markets</i>	1995: 85 (Niamey 60) 1997 : 120 1999: 102 (Niamey 73) <sup>5</sup>	1996: 71 <sup>6</sup>  1999: 160 <sup>7</sup> (Bamako 155)
<i>Sales (S) or Quotas (Q), Niamey and Bamako</i>	1995: 75.413 steres (S) 1999: 37.000-115.000 steres (S) <sup>8</sup>	1996 : 35,000 steres (S) 1999 : 346.000 steres (Q)
<i>Market sales or quotas as percent of total consumption estimate</i>	1995: 5.5 percent ( sales) 1999: 4.2 percent ( sales)	1999: 14 percent (quota)
<i>Expansion market production: expansion of consumption</i>	Consumption expanding more rapidly than market supply	Consumption expanding more rapidly than market supply
<i>Tax collection rate</i>	1988: 15 percent (before project) 1989-93: 47 percent (average) 1999: 10 percent	1995: 10 percent (before project) 1999: 9 percent
<i>Theoretical tax difference between a stere of firewood from the firewood market and outside the market<sup>9</sup></i>	1990: 0 1995: 376-488 FCFA 2000: 712-870 FCFA <sup>10</sup>	1995: 0 2000: 400-550 FCFA
<i>Tax receipts from firewood markets<sup>11</sup></i>	1992: 2 million FCFA 1995: 22 million FCFA 1997: 16-34 million FCFA 1998: 20-38 million FCFA 1999: 13-37 million FCFA	

<sup>5</sup> Crude estimates due to differences between monitoring reports, mostly due to definition of functional markets.

<sup>6</sup> Woodfuel markets functioning with project support before the legal reform was fully in place : 49 markets in Kita, 15 in the Kelka. Some differences in approach from Domestic Energy project, no quotas.

<sup>7</sup> Based on CCL statistics which exclude a number of markets in the Kelka without quota, although the same statistics include the Kita markets, which are also without quota.

<sup>8</sup> Major differences between monitoring reports. Lowest estimate is a report by a Danida consultant, the highest estimate is from a forest service report.

<sup>9</sup> This is the tax difference from the perspective of the rural firewood market producer. It equals the tax difference paid by the buyer plus the portion of taxes retained by the village.

<sup>10</sup> Planned to increase to 1,205 FCFA in latter half of 2001

<sup>11</sup> Niger : major differences between monitoring reports. Lowest estimate is a report by a Danida consultant, the highest estimate is from a forest service report. No data available in Mali since the project only provides statistics on quotas. Major variations between quotas and actual sales are possible and even likely.



#### **D. OTHER RURAL FIREWOOD MARKET INITIATIVES**

Concern over the environmental impacts of uncontrolled firewood cutting and the longer-term sustainability of firewood supplies to the rapidly growing urban areas has long been a widespread concern throughout sub-Saharan Africa. In response to this, the commercial woodfuel sector has been supported by a large number of donor projects of different types over the past two decades in various Sahelian countries and elsewhere in Africa. The early success of the Niger Household Energy Project meant that it quickly inspired a variety of similar initiatives.

The Kita project in southern Mali, supported by the ILO and UNEP, dates from 1994. It was, in fact, the first rural firewood market system in Mali, predating the Domestic Energy Project. It covers both gazetted forest and forests on village land. Establishment of markets and, even handling of taxes, has been carried out by the project rather than the state. Among its features are exclusivity of commercial firewood production by local communities, local firewood markets, and a differential tax system.

The project is based in Kita, in the south of the country where the rainfall is in the range 600-1,100 mm per year. Over the period 1994-97, the Kita project set up 48 rural firewood markets which, in 1996, had total sales of 10,710 steres of firewood, with a gross revenue of FCFA 17 million. By 2000, it had established some 90 markets, almost twice as many as the Domestic Energy Project.

Another example of the rural firewood approach is in the Kelka Forest in Mali's 5<sup>th</sup> Region, which is the main supplier of firewood to Mopti, the regional capital. The project is supported by the NEF Mali. It has been under way since 1992 and thus also predates the Domestic Energy Project. Under the project, firewood producers were organized in a basic market system which improved economic efficiency and provided a means of preventing outsiders from exploiting community forests. The system worked even before the laws on firewood markets were put in place in 1995.

Broadly similar ecological and social conditions to those in Niger and Mali tend to be found over much of sub-Saharan area. Firewood or charcoal are generally the main cooking fuels. The state tends to own or control the natural woodlands, with the forest service acting as its agent in the collection of firewood taxes and the implementation of forest laws and regulations. Local people generally have little if any real control over how the natural woodlands around them are exploited, though exceptions to this are found in the progressive land tenure laws of countries such as Mozambique and Tanzania

In Burkina Faso, during the 1990s, the UNDP provided support for the development of a forest management model, called the "chantier", whereby groups of villagers interested in commercial firewood production are trained and organized. Certain elements of the chantier, such as forest boundary demarcation, a firewood resource inventory, and some of the forest management measures are similar to the rural firewood markets.

The main difference from the rural firewood market is that the chantiers, which cover large areas and a considerable number of villages, are effectively run by the forest service. Each chantier has a team consisting of a forest engineer, a forest technician, an accountant and others. The cost of the team, including full-time salaries and operating expenses, is covered by a Forest Management Fund into which the participating villages pay. In effect, this means that there is an overhead cost of about 600 FCFA per stere of firewood sold

through the chantier. In addition, a tax of 300 FCFA per stere is paid to the treasury on wood sold by the chantier.

There is no differential firewood tax system in Burkina Faso. The taxes paid on firewood from the chantier are identical to those on firewood from uncontrolled zones. This means that the chantier, with its much higher management overheads, finds it difficult to compete in the firewood market. The main response of the forest service has been to try and force transporters to buy from the chantiers. The active involvement in the firewood trade by the military, who tend to ignore all the firewood regulations, also greatly undermines the chantier system.

The present position is recognized to be unsatisfactory and local people engaged in the firewood trade increasingly want a higher level of autonomy, resembling that of the rural firewood markets in neighbouring countries. The forest service has discussed the idea for the last five years and is nominally in favour, but to date has not made any progress. Firewood transporters are well organized but say their profit margins have been reduced to a minimum, which, according to them, is illustrated by the run-down transport fleet. The military provide a door-to-door firewood supply service which poses unfair competition to the traders since the various costs are borne by the Ministry of Defense.

It is generally accepted that the chantier is a model with high recurrent costs which cannot be applied to the drier, northern half of the country. Alternative management models have not yet been developed and the rural firewood market could serve as a model, especially as a differential tax system is currently being discussed in the country. Other possibilities are being opened by political decentralization, for which the principles have been outlined, though implementation is likely to take a long time.

The rural firewood market experience is also being discussed in various African countries south of the Sahara and a number of initiatives are under way in, for example, Mozambique. Here, some of the lessons of the Sahelian firewood market experience is already being taken into account in the planning of new local forest management initiatives. The progressive land tenure systems and less powerful role of the forest service in countries like Tanzania and Mozambique could equally be a source of inspiration for West African countries. There is much to be gained, but still a long way to go, in developing an effective dialogue between the many African countries with common concerns over the well-being of their rural populations and the preservation of the rural environment on which they depend.

#### **IV. IMPACTS ON RURAL PEOPLE AND THEIR COMMUNITIES**

The earliest rural firewood markets established in Niger have now been functioning for nine years. This should be enough for their socio-economic, institutional and environmental impacts to start becoming discernible. Obtaining an assessment of these impacts is a matter of major interest to governments, to the donor agencies which have supported these projects, and to those considering doing so in the future.

##### **A. LIMITS TO IMPACT MEASUREMENT**

Detailed impact assessments of development programmes are always difficult. Ideally, they require careful selection of key indicators, a reliable baseline against which they can be measured, and regular monitoring of the indicators over time. Given the resource, institutional

and other constraints, acquisition of such data is rarely feasible in forest management projects and certainly was not possible in the present case.

Data on the numbers of markets are available but without considerably more information, this gives little indication of the impact of the project. Beyond the mere fact that a market has been established, it is essential to know how well it is functioning; some, for example, are barely operational. Other indicators of market performance are the volume of wood sold and the amounts of money retained by the woodcutters and market managers, the financial flow of the village funds; and, if possible, the way in which village funds have been used.

Other potential indicators of impact include the number of woodcutters, knowledge of the market system among woodcutters, and the degree of market accountability. Important social indicators are the degree to which the market management committee represents the community, and the way in which village assembly fills its role as the decision-making body determining the use of discretionary funds accruing from the taxes on firewood market transactions. It is also important to know the relationships between the various local institutions and with the forest service.

The degree of social control over the local environment is indicated by factors such as the appropriation of a forest management system by local people, the number of infractions of local rules and how they are dealt with. The way in which forest management rules evolve is a useful indication of response to ecological change. The use of the Forest Management Fund and the effectiveness of investments made from this fund is also important to establish.

In general, such data are patchy, unreliable, contradictory or simply unavailable in both Niger and Mali. Nevertheless much valuable information can still be obtained by reviewing the progress of programmes in broad terms. The emergence of practical problems provides valuable lessons for governments and donor agencies considering the rural firewood market option. Field visits and interviews with local people, especially when carried out by researchers acting independently of forest service agents and programme staff, can produce informative insights into the reality behind the official progress reports

## **B. THE FINANCIAL GAINS**

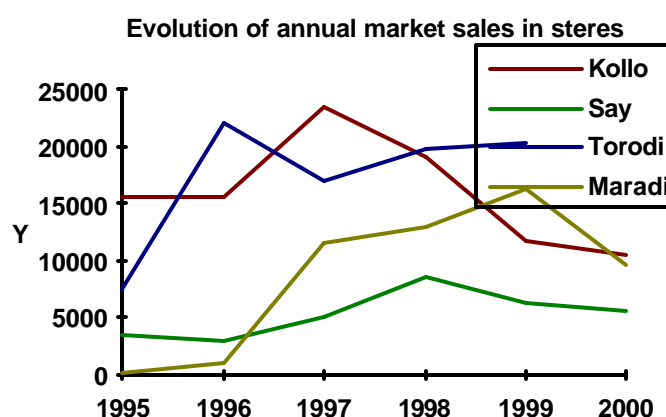
The main focus of impact monitoring in Niger has been on the financial performance of the markets. This monitoring relies on examination of market book-keeping records and, at a central level, the accounts of the BTPN.

In principle, the BTPN records include the overall revenues of the markets and the various funds at the village, district and national levels, specified by year. In practice, there are major problems in drawing up complete and consistent records. Many of the records are not comparable since they refer to different markets or different data collection methods were used. Major inconsistencies often occur when the same data are obtained from different sources. Data at the national level are so incomplete for certain years that they do cannot be used to obtain an adequate overall picture. One reason for inadequate data at the market level is the confiscation and destruction by the BTPN of the books kept by the market management in particular areas.

The main source of information used in this report is a survey of records kept in all functioning markets in the country, executed in the first half of 2000, by an NGO financed by

the Second Phase of the Household Energy Project. This survey is, to some extent, based on verbal information. Although a considerable number of markets were barely functioning at the time, records were available from more than half of the total number of registered markets.

The key indicator of financial impact is the level of firewood sales in the markets, since this determines the income of firewood cutters as well as the level of taxes paid and the funds available for village use. The evolution of market sales in the latter half of the 1990s is illustrated in Figure 1 for the major firewood harvesting zones, covering 73 markets in the Niamey and Maradi fire wood catchment areas. The remaining markets which are situated in Zinder, Tahoua and Diffa are either not functional, their records are missing or they contribute a negligible amount to the overall market production.



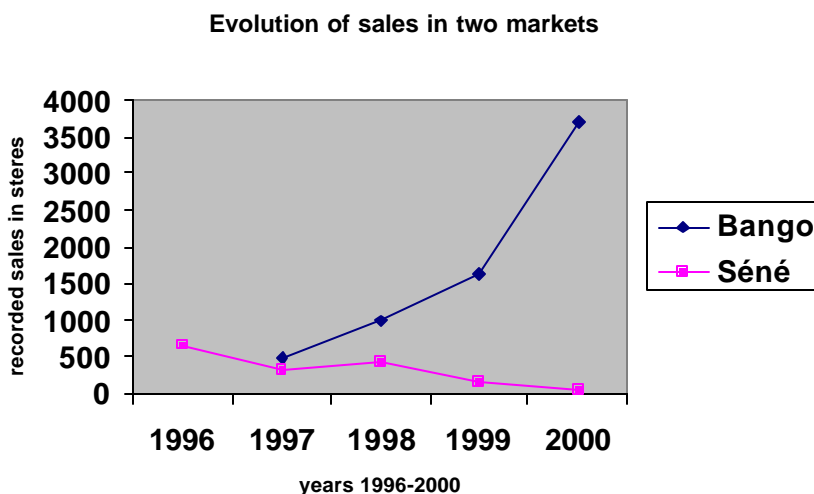
**Figure 1 Evolution of firewood market sales in Niger 1995-2000**

The figure shows that market sales have generally not expanded over the period 1997-2000 and, in some cases, have declined significantly since 1997. This is generally considered to be a result of raids on the markets and villages by certain BTPN units.

The total level of firewood sales is in the region of 60,000 steres per year, excluding markets for which figures are unavailable. This is roughly the same as the figures for 1994 and 1995 before Phase I of the project ended. Thus, even if they have not grown, the markets have proven to be financially sustainable in the absence of a project structure. This is a highly significant outcome; very few projects in Sahelian woodland management have achieved this.

The most plausible reason why the markets have not expanded either in numbers or overall sales is the opposition of powerful groups in Niger, especially in the forest service. A second reason is that the financial resources made available by donors to set up new markets since 1997 have been very modest. As long as the establishment of new markets is expensive, meaningful scaling up of overall market production remains a distant objective. It is for this reason that the new phase of Household Energy Project aims at greatly reducing costs and simplifying management so that scaling up in the absence of major project funding becomes a practicable option.

The overall sales shown in Figure 1 do not show up the differences which can exist between markets. An illustration of greatly expanding and diminishing firewood sales in two villages is provided in Figure 2. In the village of Séné Kinde, market sales have steadily declined over the past four years, with the market becoming effectively non-functional in the year 2000. In the village of Bango, in contrast, sales have shown a seven-fold increase since 1997.



The reasons behind such differences are rooted in the complex fabric of the local society. In Séné-Kinde, villagers developed commercial firewood production but found that sales outside the official market were more profitable. They maintained the market structure but greatly reduced sales through the official market while increasing unregulated sales. They are not the only village where the formal market structure is just a part of a larger marketing scheme.

In Bango, villagers developed commercial firewood production to a point where every family became involved and to the extent that ecological sustainability is at risk. The villagers recognise this, but they are not the owners of the land they occupy. Instead, they pay an annual fee to the descendants of the founding family who live in Niamey. Because the villagers are worried they may not be allowed to stay on the land, the issue of long-term ecological sustainability of the village forest is not a primary concern and they prefer to maximise their return while they can. This ownership issue, which puts the long term sustainability of the market at risk, was not understood by project staff at the time the market was being set up.

Séné-Kinde and Bango are just two examples of the many markets which make up the aggregate production and sales figures. Projects cannot deal with the complexities of all the individual villages but they need to recognize the existence of underlying issues such as land ownership and trade-offs between different user groups. Such understanding will contribute to a better regulatory framework on the long term.

### C. WHO BENEFITS, WHOLOSES ?

The rural firewood market system brings benefits to some while others lose. An understanding of the balance between winners and losers is an essential element in effective policy-making.

#### *The winners*

The World Bank, in 2001, commissioned a study which looked closely at the socio-economic impact of a sample of five markets all of which had been running for 5-9 years. The winners in the sampled communities were found to be primarily the woodcutters though there were major differences between villages in the social groups represented among the woodcutters. In some cases, the benefits were extremely widely spread, with all families having men who participated in firewood production, whereas in other villages, the woodcutters and their families made up a minority of the community.

In one village, local people were found to have hired migrants to do the work for them while they kept a major part of the financial gains. This way of operating resembles that of woodland exploitation by town based traders, with the difference that local people make the profits.

Although woodcutters are the most important income earning group, certain individuals tend to gain large profits based on their position in the market management structure or in the community. They tend to appropriate significant sums of money from the village discretionary funds or woodland management funds. Some cases are reported of collusion between such individuals and corrupt forest agents in the looting of village funds or exploitation of the village forest.

Disbursement of the various village funds resulting from the allocation of taxes to different purposes (see Section 2.3) creates other groups of beneficiaries. These may be the community at large or certain groups within the community. Examples are repairs to the village water pump, creation of a cereal bank or a dispensary, payment of casual labour for a plantation. In the sampled villages, however, the majority of payments made from village discretionary funds have gone to specific people rather than the community.

The intended objective in setting up village forest management funds was to improve the sustainability and productivity of village forests. Specific measures promoted using such funds include setting up village nurseries or plantations with payments going to particular villagers or members of the firewood market management. In the general absence of records of what exactly was done, where seedlings were planted or what survival rates they achieved, the only certainty is that some villagers enjoyed a degree of improvement in their incomes.

In some of the sampled cases, certain forest agents, particularly from the BTPN, have financially benefited from extortion of funds from the markets. It can, perhaps, be argued that they would have gained even more if the markets had not existed.

#### *The losers*

An exact and detailed balance of winners and losers is not realistic given the complex social and economic relationships of rural Niger. Even those who appear to gain from the markets are also subject to a certain loss, be it only in time, because certain subsistence

products can no longer be readily collected, or because the activities of certain family members are displaced by the establishment of the markets.

It is, nevertheless, possible to identify certain groups who clearly lose significantly as a result of the markets. These are listed in the box below, summarising the verbal responses of affected people interviewed during the field work.

INTEREST GROUP	LOSSES RESULTING FROM THE FIREWOOD MARKET
<i>Women</i>	The men get their money, and marry new wives. We have to walk longer distances to gather firewood. Some of us even made some money from firewood collection but this no longer happens. And then there is the gum collection which earned us cash. But now the gum tree is being cut for firewood and we are left without.
<i>Peuhl livestock keepers</i>	We are the people who lived here before the firewood market. The project only brought us restrictions. Furthermore, our woodlands have deteriorated, both as a source of fodder and for other products such as the gum.
<i>Giraffe guides</i>	The giraffe guides (in an area with some of the last giraffes in the country) say that the markets have helped to degrade the habitat of this animal. The association of guides can earn up to 6.5 million FCFA from tourists every year as long as the giraffes are there.
<i>The wood artisans</i>	The firewood markets have led to the cutting of valuable trees for firewood; trees which are much more valuable for other purposes. The appropriate wood sticks can be reshaped and sold at prices up to a hundred times over and above their firewood value. Why not respect these trees ?

This does not mean that all these people invariably suffer as a result of the establishment of a firewood market. Herders, for example, tend to be much more concerned about wholesale destruction of forest through agricultural expansion, the blocking of livestock corridors by agricultural fields, or the establishment of a national park. The formal recognition of a village forest through the market system is likely, on balance, to produce considerably greater benefits than costs to rural dwellers, but the management rules need to be fine-tuned to take into account the legitimate concerns of all forest users, not just the firewood cutters.

#### **D. USE OF FOREST MANAGEMENT FUNDS**

The Niger Household Energy Project had strict provisions authorizing the ways in which taxes collected by rural firewood markets might be spent. In effect, the regulations established two funds: the Village Forest Management Fund and the District Forest Management Fund (see section 2.3.1).

The Village Forest Management Fund, in practice, is an amount of money kept in a cash box with accounts which are a part of the overall accounts system kept by the treasurer. The intention is that these funds are invested in measures which increase the productivity of the local forest with technical assistance being provided by the forest service on demand.

A series of relatively informal evaluations covering most of the markets carried out in 2000 showed that, over the period 1996-1999, little investment had been made. The main activity was the establishment of village tree nurseries with the funds being used to pay for equipment, polythene bags, seed and labour. The results for the different zones can be summarised as follows:

- Most of the 27 markets evaluated in Torodi had established a nursery, with a minor production capacity, but no evaluation had been made of what had happened the seedlings. From 1997 onwards, all the Village Forest Management Funds had been confiscated by the BTPN.
- All 13 markets in Say had a small village nursery in 1996, but only one existed by 2000. From 1997 onwards, much of the nursery equipment, as well as funds, were stolen by the BTPN.
- Little information was available on any disbursements of Village Forest Management Funds in the 24 markets in Kollo but, in 2000, none had a nursery.
- Out of the 24 markets in Maradi, one had a nursery in the year 2000. Many villages had a nursery at some stage, but were later forced by forest agents to buy plants from the forest service central nursery. No information was available on what had happened to the plants.
- Of the 26 markets in Zinder, about ten were more or less functional at the time of the evaluation but no information was available on their Village Forest Management Funds.

In Mali, the Forest Management Fund have not yet been used. They are being kept at the central level until decisions are made on disbursements. It is therefore too early to assess the impact of the Fund, although it is evident that there will be no impact until decisions are made and carried out.

Forest management activities have been carried out in some markets with the assistance of parallel funding from donor agencies. In the Kelka forest of northern Mali, investments have been made by 13 villages in nurseries; micro-catchments; and some 10 ha of plantations with fencing, dry season irrigation, and in some cases, paid guards. Survival rates in the plantations are poor due to drought and livestock intrusion. Even if the plantations have done well, their impact on the 100,000 ha natural forest would have been negligible.

#### *Questions over use of forest management funds*

The available data raise a variety of questions over the use of Forest Management Funds. To date, such funds have been used for classic forest service interventions in the form of tree nurseries, plantations, and forest “restoration” measures. The experience from the rural firewood markets simply confirms the lessons learned from Sahelian forestry interventions since the 1970s: such investments are rarely successful in physical terms and even less so economically.

A more useful application of the fund would be in the provision of fruit, timber and shade trees which villagers could plant on their compounds or in agricultural land. Although



such use of the Fund would not conform to the statutory requirement that it be invested in the village forest, there is no reason, in principle, why such agro- forestry uses should be excluded.

This raises the question, at least for the Sahelian zone, whether it is more useful if the District Forest Management Fund were to be amalgamated with the Village Fund which would enable the available money to be invested in projects determined by villagers themselves rather than forest agents. A more radical question is whether the competitive burden placed on rural firewood markets by the whole forest management fund taxation structure is in any way justified by its past or likely future results.

The use of funds to enhance forest management in the higher rainfall areas is a different matter. The likelihood of being able to devise and implement useful interventions, given the wider range of practicable options available, is greater. Successful examples of such interventions are found in the Kita project in southern Mali, where forest management investments have been made for a considerable period. These investments have so far been made by donor agencies, in anticipation of funds to be made available from the Forest Management Fund.

#### **E. ECOLOGICAL IMPACTS**

Little monitoring of the ecological impact of the rural firewood market system has been carried out to date. Given the slow pace of ecological change to be expected, as well as the costs of monitoring, this is understandable. Anecdotal evidence, however, suggests that villagers are noticing differences.

A study supervised by CIRAD Forêt assessed ecological changes in two village forests based on observations by villagers. According to this report, the multi-purpose species *Combretum nigricans* is generally regressing both in numbers of trees and tree diameter. Other dominant species appear to be relatively stable in spite of firewood cutting for up to 9 years but, according to certain user groups, such as the artisans, trees of certain shapes and diameter have become rare.

There are no reports of wholesale deterioration of village forests through, for instance, agricultural expansion. This suggests that the firewood markets have helped to secure the forest against intrusion from outsiders or from inside the community. Examples also exist of villagers defending their forest against town-based firewood traders who, with or without collusion of a local forest agent, intruded on their land.

Any conclusions drawn from such studies of ecological impact should, however, be treated with caution. Reported changes in managed village forests need to be compared with ecologically similar unmanaged areas of forest if a valid assessment of the impact of the management measures is to be made – which has never been done. The fact that rainfall during the 1990s was relatively good also needs to be taken into account as improved growth may be simply a result of this rather than the management measures. It is also important not to over-generalise results. Almost all the impact studies have been carried out in the Niamey firewood catchment area; much less is known about the village forests of Maradi and Zinder, which are situated in different ecological zones.

Forest plantations and other afforestation works have been carried out with the assistance of the Village Forest Management Fund in, at least, some villages but there are few

indications of their impact on the forest ecology. The small number of observations made to date suggest that they are rarely successful and, in any case, cover only a tiny proportion of the forest. The lesson to be drawn is identical to that from review and analysis of earlier donor-supported interventions: the Sahelian forests can successfully be managed as a natural resource, but cannot be planted on a meaningful scale.

## **V. THE SDA AND QUOTA APPROACH**

The firewood market systems in Niger and Mali were founded, and remain nominally based upon, the concept of the firewood supply master plan (SDA). These were prepared, in each country, by the project design teams as the first step in setting up the firewood market system.

The aim of the SDA is to provide planners with a tool for achieving a long-term balance between firewood supply and demand in the fuelwood catchment area of the urban area being supplied. A variety of questions about the utility and practicability of the SDAs have emerged since they were introduced in the early 1990s.

### **A. DRAWING UP THE SDA**

Drawing up the SDA involves a large amount of fieldwork and desk-analysis and, given the shortage of technical and financial resources in the countries concerned, can only be undertaken with substantial, and relatively long-term, donor support.

The first step is to prepare a detailed inventory of the natural woodland resources in the catchment area. This is done using Landsat or other satellite images, cross-checked by sample ground-truthing. The resource assessment is based upon clearly defined areas of permanent forest and cannot take into account the wood resources on fallow lands, farmlands and other non-forested areas although these can be an important source of wood, especially for local people.

The natural woodland areas are then broken down into different categories, depending on the standing stock identified in the inventory. In Niger, three categories were used, in which the standing stock was estimated to be 11, 7 and 3 steres per hectare. Sustainable annual yields of 1.0, 0.6, and 0.2 steres of firewood per hectare were respectively estimated for the three categories and total sustainable catchment yields could then be calculated.

Surveys of the firewood trade, both truck transport and sample households, were carried out to obtain an estimate of total consumption in the urban areas being considered. The figures obtained were projected forward, basically in line with population growth, to obtain estimates of future demand. These showed major firewood supply-demand "deficits" in which the consumption greatly exceeded the sustainable yields in the catchment areas.

The firewood catchment area was then disaggregated, using the canton or arrondissement as the basis. In Niger, the available information on each canton from which fuelwood was being supplied to Niamey was synthesized and presented in the form of a "decision grid." This presented, for each canton, the total annual production of the natural woodlands, the balance available for export to Niamey, using the assumptions that either 50 percent or 100 percent of the needs of rural people were met from their local woodland resources, and the actual amounts of fuelwood being exported to Niamey. Other data, drawn

from the agro-socio-economic analysis, and included in the synthesis of information for each canton, were the population density, the dominant land-use type, and the degree of social cohesion existing in the area.

From this "decision grid" it was possible to identify areas where the establishment of rural markets was likely to be a realistic option. It would not make sense, for example, to set up a rural fuelwood market in an area where there were insufficient wood resources to provide a sufficiently high level of sustainable supply to justify the effort and expense involved. Similarly, it would be pointless to try to establish a market in an area without the social cohesion necessary for its effective functioning. Areas of abundant resources where the social and other conditions were fulfilled, on the other hand, would be natural priorities for the establishment of markets.

The decision grid also highlighted the areas where the supply-demand deficit was highest and fuelwood harvesting needed to be discouraged and measures taken to increase the productivity of the remaining woodlands. The creation of the SDA thus provided a basis for identifying areas for priority action in setting up rural markets and drawing up local forest management plans.

The quota for each market was calculated using the estimated sustainable yield per hectare for the area shown in the overall SDA. This was then translated into an allowable annual firewood offtake for the market. In Mali, and more recently in Niger, simple forest inventories are done by a team of foresters to help calculate the quota. The final figure, which forms part of the market agreement, is, in principle, determined in consultation with the village, taking local circumstances into account.

### *Problems with the SDA approach*

Drawing up the SDA is highly resource intensive. Moreover, it only provides a snapshot at a particular time and, if it is to form a long term basis for planning firewood supplies, needs to be updated as circumstances change. In particular, harvesting quotas need to be changed to reflect changes in the SDA, as well as those occurring at a local market level. Given the availability of financial and technical resources in the countries concerned, it is clear that the SDA is neither practical for countries on their own nor sustainable beyond the end of donor funding.

In Niger, the SDAs drawn up in the early 1990s have not been updated and they have not been used in the establishment of new markets since 1996. The projects presently operating in Niger do not intend to update the SDAs prepared during the first phase. The planned large number of new markets will be established without the use of SDAs.

There is also considerable doubt over the models and scenarios used in drawing up the SDAs. The projections of overall fuelwood consumption and the emergence of energy "gaps" have in general proved themselves wrong and a high degree of scepticism in this area seems to be justified.<sup>12</sup>

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<sup>12</sup> Hindsight suggests that the level of consumption in the rural areas was greatly over-estimated in the analysis. The issue is discussed in detail in *Sustainable Woodfuel Supplies from the Dry Tropical Woodlands* (G. Foley) as World Bank, ESMAP, Technical Paper 013, June 2001).

The levels of disaggregation used in SDAs are also questionable. In Mali, where the SDA generates data at the level of the *arrondissement*, project staff recognize that this may not be the appropriate scale of planning given that the markets function at a village level. The establishment of the *communes* in 1999 makes planning at the *arrondissement* level even less relevant. Some of the project staff feel that new SDAs, tailored to the *communes*, should be produced but this raises questions of technical and financial resource availability.

Experience of the Swiss-assisted project near Sikasso in Mali suggests that the true criteria for the establishment of viable markets are precisely the opposite of those used in the SDA. The project staff in Sikasso have found that it is not the well-forested zones which are most suitable for market establishment but rather the well-populated zones with good road infrastructure and sufficient labour, even if their firewood production potential is lower.

The Sikasso projects also illustrates the fact that in a landscape with advanced agricultural expansion, village forests are patchy and cover modest areas. Yet the socio-economic potential for commercial woodfuel production in such an area may be good, since the road infrastructure is excellent and there is plenty of labour available during the dry season.

A major weakness of the SDA approach is that it cannot encompass the many different possibilities for commercial firewood production in a variable mosaic of village forests. As agricultural expansion continues, such mosaics will probably dominate at the expense of forest reserves. East African examples show that wood production by rural people for urban markets can offer substantial opportunities but needs a much greater flexibility in technical and economic decision making than that presently defined by the SDA and the quota system in the market model.

In such cases, instead of a firewood-focused SDA, a more relevant exercise is likely to be a broad-based approach such as that used in '*gestion de terroir*' projects. These projects take the village territory as the basic unit of planning, in which forest resources obviously play a role. By adopting this more aggregated and broad-based approach, rather than focusing purely on firewood production, it becomes possible to give issues such as agricultural expansion, the growth of cash crops and the provision of pastoral tracks the attention they require.

#### *Questionable validity of quota system*

The forest productivity estimates used in the SDA are used as the basis for the rural firewood market quotas. The estimates of productivity are determined in relation to the vegetation cover and the average rainfall over a particular area which, in Mali, is the *arrondissement*. Such estimates can, however, be far from the reality at a village level of which there may be dozens in a particular *arrondissement*.

Simple, rapidly executed forest inventories are presently standard practice in the preparation for setting up a rural market in both Niger and Mali. They are completed in less than a week and undoubtedly contribute to the understanding of the village forest by the project team. On the other hand, since the villagers do not understand this type of inventory, the exercise is of little use in formulating management strategies which are acceptable at the local level.

Moreover, the utility of woodland inventories as a basis for determining sustainable annual yields is questionable. An inventory provides information about the vegetation cover, but this is not necessarily linked to productivity, as studies of the contracted vegetation or “tiger bush” showed in Niger. Additionally, rainfall can be so variable over extended time periods that fixed annual estimates may be quite unrealistic at any particular time. Quotas based on large-scale averaging, in short, can be completely inappropriate at the individual village level. Neither are fixed annual harvesting quotas likely to match the shifting priorities of the local economy as people respond as best they can to changes in rainfall, crop yields, labour availability and other factors.

In setting up many of the markets in Niger, no serious attempt was made to calculate a quota based on productivity. They were simply given an arbitrary quota of 1,500 steres per year, irrespective of the forest size or productivity. This figure is supposed to be reviewed regularly but this was not done, though it is intended to happen in the present new phase of the project.

In the successful Kita project in Mali, the SDA-based quota system has never been used. Instead, informal judgements are made, on an *ad hoc* basis, on the amounts that can safely be harvested in particular areas. There are, it is true, concerns over ecological sustainability in Kita but the main reason for such concerns is the entirely different issue of the expansion of groundnut and cotton production into areas of natural woodland. It appears that firewood marketing opportunities do not stop local people from converting forest into agricultural land if they anticipate higher benefits from such alternatives.

Similarly, in the Kelka Forest project in Mali, no quota system was put in place. Instead, the project concentrated on strengthening the local management structures, which included the establishment of a union of village market operators. This proved effective in dealing with conflicts between villages and problems with outsiders. Many of the firewood harvesting rules were defined by individual communities and varied from forest to forest; the internal organization of the village management structures varied also.

Both the Kita and the Kelka experience suggest that simplified and locally defined planning tools can be more effective than quotas which, if they do not bear a close relation to locally-perceived reality, are unlikely to be treated seriously. Villagers who consider themselves rightful owners of their forest know very well how their resource changes and how heavily it can be exploited at any given time. They may, of course, over-exploit their forest resources but the imposition of externally-determined harvesting quotas is unlikely to change such behaviour.

It is also true that, in the absence of regular high-quality ecological monitoring, the long term sustainability of firewood markets operating without a harvesting quota cannot be established. This is an argument which carries considerable weight in forestry circles where distrust of local people’s approach to firewood harvesting runs deep. But even if such fears are justified, the imposition of inappropriate, rigid or unenforceable quotas provides no solution.

Long term ecological sustainability in the management of natural forests would be better supported by ensuring that forest conditions are regularly reviewed, in the first place by local communities themselves, supported by local government and by foresters. Any necessary corrections to the management rules can then be agreed at the local level. Remote sensing and other information technologies are developing rapidly and becoming cheaper and

could be used to monitor and interpret local changes. In general, it would appear, however, that the usefulness of quotas is more likely to be found in more sophisticated resource management for which the majority of markets have neither the technical nor financial resources required.

#### *An example from Mali*

An illustration of how the complexity of events at the village level can completely undermine elaborate management and quota arrangements comes from Kankani in Mali. The local rural firewood market, which was of the oriented type, had been dealing exclusively in dead wood left over from earlier droughts. When such stocks are exhausted, the normal procedure is that the market becomes controlled. This is called “the transition” and should be initiated by villagers who realize that there is no dead wood left.

Although the procedure for market transition is fairly flexible, project staff found that the villagers in Kankani were skeptical about the controlled market. Two reasons were put forward: the first was that the local people have their doubts about forest sustainability if green wood was cut; the second was that they believed that the forest agents would never change and would fine them if they were found with green wood.

The transition to a controlled market in Kankani should have taken place in 1996. Instead, the wood cutters have done everything they can to find dead wood and avoid cutting green wood. They have made use of their many ties with other villages in order to gain access to other forests. They have not hesitated to cross into Burkina Faso, either to cut wood there or to purchase from local producers and then sell on their own firewood market.

The market quota is 2,500 stere per year but over the last five years they have sold an average 10,000 stere per year. This is theoretically not possible, but the market has always managed to purchase the necessary coupons from the forest service.

#### *Firewood not necessarily a constant local priority*

An important factor which needs to be borne in mind in planning rural firewood markets is that firewood sales are not necessarily a constant local priority. Their importance varies depending on a variety of circumstances.

Survival strategies in the Sahel, especially to the north, are necessarily opportunistic, reflecting the changing circumstances in which families find themselves. This is widely recognized in the case of nomadic pastoralism, but it is equally characteristic of farming communities. Crop production is highly variable and it is often insufficient to meet the food needs of farming families. A range of complementary economic opportunities such as temporary or long term migration, herding and forest exploitation are relied upon, in effect constituting a form of economic nomadism.

Many donor interventions have focused upon fuelwood production as the primary goal of woodland management but while this may be the most important source of income in some areas, in others it is not. Moreover, the relative importance attached to firewood production in comparison with agriculture, cattle rearing and other activities in any particular area can vary greatly with time and circumstances. Livestock rearing, which is often neglected, or

regarded as a problem to be dealt with in woodland management projects, can play a particularly important role in family survival strategies.

The aim of sustainable wood production as the principal objective of woodland management is not shared by the majority of the people and communities who depend on these woodlands areas for everything from pasture, fruits, game, fuel and construction wood, to acting as land bank which can be used for agriculture when the need or opportunity arises. Indeed, what the forester or firewood producer conceives as reforestation may be regarded as highly undesirable bush encroachment by the local agricultural population, pastoralists or range managers.

The fact that the SDA is focused entirely on firewood production, as though this were the only output from the land involved, is already a major distortion. The fact that firewood harvesting quotas are defined entirely by ecological standards means that it is only by coincidence that they bear any relationship to the reality of the economic fluctuations which determine the level of villagers' interest in firewood production at any particular time.

## **B. NEED FOR BROADER FOREST MANAGEMENT APPROACHES**

The long-asserted justification for incorporating forest management measures into rural firewood market agreements is that forest services and donor agencies are more skilled and responsible in local forest management than local communities. Experience over the past two decades is gradually undermining this proposition.

Early forest management projects incorporated a variety of measures to increase forest yields. Under the assumption that the "tiger bush" represented a degraded form of natural woodland, for example, a variety of expensive and labour-intensive measures to prevent rainwater run-off and promote tree growth were incorporated into various projects. Research carried out under the Household Energy Project in Niger, however, showed that the "tiger bush" tends to represent the ecological optimum within the areas in which it is found. The management measures in addition to being expensive and unsustainable were actually counterproductive in terms of woodland productivity.

The Household Energy Project also found that the large expenses incurred in the employment of forest guards to protect forests against human and animal depredations, and thereby foster regeneration after firewood harvesting, were largely wasted. So clearly marked has been the forest management experience in the Sahel that it can be formulated into a simple rule of thumb. The greater the expense incurred in forest management, the less effective and the less sustainable it will be.

The firewood market concept is a major step forward from such earlier projects. The success of so many markets, in spite of the various problems they have faced, bears witness to the value of the concept. Almost ironically, however, the experience of such success is revealing the limitations of the approach. Giving firewood production priority has enabled the firewood market approach to be developed. It has also revealed the need to integrate the firewood market concept into a broader natural resource management approach.

The problem is that, despite their success, the local management structures and technical toolkits of the rural firewood markets are of much reduced relevance outside the firewood context. The local management structure is dominated by firewood producers so that it poorly represents other forest users, as demonstrated by a host of evaluations. Unless

women are active in market production, they are unlikely to be represented; the same applies to herders.

Moreover, in most forests, planks, food, fruit, fodder and honey are economically more important than commercial firewood. The groups who use such products are rarely represented in the local management structure set up for the firewood market. Unless these other woodland user groups are given an effective voice, the risk is that internal village discontent will undermine the market approach. The challenge is to develop the model to incorporate other concerns besides firewood production.

Precedents already exist. The Palm Tree Project in Gaya, Niger, has experimented with management structures since the mid-1990s, basically by encouraging communities to organize their own management structure instead of copying the model prescribed in the 1992 Order 92-037. Presently, the management structures in Gaya cover all aspects of resource management, from the bird population to woodfuel, although their first concern is management of the highly valuable palm tree groves. The internal regulations vary from village to village and are adjusted to local economic priorities.

As with many other projects, the rural firewood market model has served as a starting point for negotiations between local organizations and the forest service. As it became increasingly clear that elements of the market model were unsuitable for Gaya, innovations were made. The quota introduced by foresters, for instance, made no sense to local people; one does not cut a single palm tree as long as it is alive and productive. But the notion of exclusive local exploitation rights in exchange for forest protection was appreciated. Protection by village brigades is meant to deal with infractions locally, so that the proceeds stay within the community. This may not be legal as far as the law on firewood markets goes, but it is an efficient protection system.

With decentralization proceeding, institutions and laws will in any case deal with resource management as a whole. Firewood markets have proven their worth but the concept should now evolve in the context of more equitable, accountable and democratic societies.

## **VI. TAXATION SYSTEMS**

The rural firewood market projects implemented in Niger and Mali have incorporated firewood taxation systems, in some cases involving elaborate differential taxes. These taxation arrangements were intended to fulfill a variety of functions.

### **A. OBJECTIVES OF DIFFERENTIAL TAXATION SYSTEMS**

One of the most important intended roles of differential taxation of firewood is to provide a fiscal incentive to firewood traders to use the markets rather than obtain their supplies in an uncontrolled fashion from natural woodlands. Wood from the market system is inevitably more costly to the trader than that from natural woodlands, partly because it includes a profit element for the market and partly because uncontrolled exploitation, without regard to sustainability, tends to be less costly than that incorporating a degree of management.

One of the roles of tax on firewood from uncontrolled areas is to reflect the costs to society of uncontrolled exploitation. Taxing firewood from uncontrolled sources at a higher



rate than that from markets, in principle, fulfills this objective and depending of the level of the tax, helps the sustainably-produced firewood from the markets to compete commercially.

Differential taxes have also been incorporated into the market systems in order to achieve a variety of other objectives. In Niger, the tax is intended to favour controlled over uncontrolled markets; it is also intended to encourage exploitation of more distant firewood resources over those closer to the urban areas. The taxes on markets themselves are intended to provide revenue to the government – this is their primary function in Mali. They are also intended to raise funds for investment in forest conservation activities – which tend to be at the discretion of the forest service. In addition, they are intended to provide villages with markets with a flow of funds for investment in communally beneficial projects.

#### *Undermining effect of poor rates of tax collection*

All such differential taxation systems presuppose that the fuelwood tax-collection process is working effectively. This is not the case in practice. The firewood tax collection rates in Niger and Mali, despite major efforts by the projects, are around 10 percent. Other countries tend to report similar figures; in Mozambique, the rate is reported to be 6 percent for the city of Maputo; in Burkina Faso it is about 20 percent. Such collection rates completely undermine the differential tax system and make it, effectively, meaningless.

In fact, the reality is even worse. Taxation of markets, which occupy fixed points, is easier and more transparent than of uncontrolled areas and is generally more effective. With firewood supplies from uncontrolled areas being virtually untaxed, the overall impact of the taxation system is to skew the competitive balance against, rather than in favour of, the markets. Any potential impacts of the differential taxation refinements designed to favour controlled over uncontrolled markets or encourage exploitation of one area rather than another are swamped in the overall biases and inefficiencies in the system.

Nor are there compensating benefits for market villages in terms of investments in forest management measures. The unwillingness of hard-pressed national treasuries to disburse funds for investments in forest conservation or village projects means, in effect, that the taxes nominally destined for such uses are simply abstracted from the rural firewood market system. The same applies when funds are directed into forest service projects of little if any benefit to local communities – or simply stolen by forest service agents.

Given the above, it might be wondered how the markets have managed to survive. The reason is that villages gain substantially from the markets and have a major incentive to make them work even if the tax collection in uncontrolled areas is poor. In Niger, the very idea that the BTPN would no longer operate in a village was, in itself, an incentive to establish a market. Well-intentioned forest agents, without whom the firewood market system would never have been effectively put in place, sometimes put pressure on transporters to buy first from the markets and then harvest in uncontrolled areas. Nor are villagers, themselves, immune to the temptation to circumvent the tax regulations in order to sell their stocks and increase their profits.

Firewood which is illegally transported may, of course, be subject to bribes which act as an effective tax on such trade. The effects are, however, unpredictable and offer no guarantee that they support the objectives of the nominal taxation structures built into the design of rural firewood market systems.

### *Coupon fraud*

The transport coupons are essential to the operation of the differential tax system in the rural firewood markets. They are obtained by the market manager from the forest service. Firewood transporters pay for the wood as well as the relevant taxes in the market, and once a month the market manager and treasurer meet the forest agents to pay the share of the taxes destined for the district and state authorities.

In Niger, once the World Bank involvement in the Household Energy Project was over, certain forest agents managed to obtain coupons illegally, either through theft from the forest service offices or by printing them in Niamey. One booklet contains 50 coupons, each for one load firewood, yielding a nominal profit of some 500,000 FCFA per booklet.

In some cases, the complicity of the market manager had been secured and the firewood trade was conducted on an entirely illegal basis. The fraud was particularly blatant in Torodi, where the parallel coupons were undermining the taxation system so completely that most of the markets were facing increased difficulty in selling their stock. The representatives of the markets got together and constituted an association to investigate the fraud and combat it. The forest service then started audits which led to the arrest of two agents.

### **B. POOR PROSPECTS FOR REFORM OF TAX SYSTEMS**

Experience with conventional taxation systems, operated by forest services, over the past decades of forestry projects of all kinds has been a virtually unrelieved catalogue of more or less complete failure. Nor does the evidence offer any realistic hope that the implementation of firewood taxation systems can be effectively reformed. The fact that corruption is not confined to the lower ranks of forest services and tax-collection agencies but provides spin-offs to higher levels in the administrative hierarchy means that attempts to crack-down on fraud will almost inevitably fail. For projects, the conclusion must be that taxation systems should be as simple as possible; should bear extremely lightly on markets; and should retain any funds intended for village use within the village.

One proposal is to render the markets tax free while keeping the differential tax on firewood from uncontrolled areas. This would ensure that producers operating under the market system are not punished, even if tax collection in uncontrolled areas is extremely poor. Another proposal is to make the market management responsible for tax payment directly to the Local Authority tax office, retaining the 10 percent commission which at present is paid by law to the person, almost invariably a forest agent, who renders the taxes. It has also been suggested that local taxation offices could be made responsible for certain tax control functions. Measures such as these become increasingly realistic with the advance of decentralization.

### *Possible involvement of private sector*

In Mali, the possibility of making the private sector responsible for various forest control functions such as tax check-points around the major towns is being explored. This is inspired not only by the encouraging results of the private sector in market establishment, but also in numerous other sectors in the economy. In Niger, for instance, road tolls are now operated by

the private sector. But to date, no experience exists in the privatisation of firewood tax controls.

## VII. THE ROLE OF FOREST SERVICES

Forest services throughout Francophone Africa have an unenviable, but generally deserved, reputation for corruption, inefficiency, and bullying behaviour. In other areas of Africa, where the forest services are not organized on military lines, their image is more benign but low salaries as well as lack of funds and physical resources mean they are generally ineffectual and liable to corruption.

During the French colonial period in West Africa, the organization of the forest services always included a strong militaristic streak which persists to the present day. These services were set up and run in accordance with the traditions of the French forest service, *Office National de Forêts*, in which foresters still carry firearms and are organized on the lines of a military hierarchy. The first Malian foresters, for example, were soldiers who had returned from the first world war and were employed to protect the colonial forests.

With independence, the role of the forest service was generally reinforced and extended. In most Sahelian countries, an impressive system of sanctions inherited from the colonial regime remains in place. Clauses on collective guilt, for example, have remained in many forestry codes, making the accessories to forest crimes as culpable as the perpetrators. These guilt-by-association provisions and other powers have been widely abused by forest service agents. The fact that forest service salaries tend to be extremely low, and sometimes many months in arrears, means that the temptations to exploit their position are often irresistible.

Rent extraction by the forest service has been institutionalized and encouraged through the formal and, entirely legal, redistribution of fines to the various levels in the administration. From the individual forest agent point of view, however, it makes even greater sense to tax or fine and keep or share the proceeds, than hand them to the taxation authorities, which helps explain the low levels of tax collection.

A range of strategies have been developed by agents to avail of the opportunities open to them to maximise their incomes. These activities are carried out by *local forest stations* or by Forest Brigades, special mobile units formed within the forest service with the ostensible task of protecting forest resources. Typically, the members of these brigades are clad like soldiers and armed with automatic rifles. Over the decades, the brigades have created a tradition of punitive raids which have instilled fear in rural people and against which they are largely defenceless. At times, their audacity can be breathtaking.

In Niger, for example, farmer-training carried out under an agricultural project demonstrated the usefulness of pruning and pollarding trees. The farmers found, however, when they applied their new skills, that foresters were the next to visit and fine them for carrying out the pruning and pollarding.

Another incidence of the same type of behaviour occurred under the World Bank's Household Energy Project in Niger in which on-farm experiments were carried out with selected villagers on how best to prune trees. The project researchers coordinated their fieldwork with staff of the local forest office but, despite this, the same foresters went to the

farmers the day after the research visit, and fined them for pruning the trees. The farmers, understandably, lost any interest in further participation in the research.

Yet another example comes from Mali where, under an agreement signed in 1994, local woodland management was transferred to a number of local organizations. When the agreement ran out in 1998, a team of six uniformed forest agents, wielding guns and occasionally firing volleys in the air, raided dozens of villages. A person with local knowledge was asked, forced or paid, to tell the agents where local camps and hamlets were located. When these were visited, the existence of a fence, hut or other construction was taken as evidence of a forest offence. Forest products, tools and means of transport were confiscated at weekly markets, villages as a whole as well as individuals were fined and small livestock belonging to herders were confiscated.

Despite all these oppressive activities, the actual number of forest services agents employed in the various countries has always been far short of that required for effective enforcement of the forest protection legislation. Sometimes, one or two forest guards are supposed to protect forest reserves of 5,000 ha or more; at other times, a guard may be responsible for several different forest reserves. Under such conditions, no useful level of management or conservation activity is possible and agents, understandably, tend to concentrate on making the most of their income-gaining opportunities. Indeed there is a built-in conflict of interest from the beginning in that it makes no financial sense for forest agents to teach and assist local people to manage their own affairs, least of all in ways which make it more difficult to fine and extort from them in the future.

#### **A. THE RETURN OF PUNITIVE RAIDS**

The Niger Household Energy Project made a major effort to reduce the irresponsible punitive powers of the forest brigades. It was included in the 1992 Order No 92-037 that their activities would be restricted to the roads and uncontrolled zones and they were no longer entitled to operate within the firewood market areas. The sheer fear the brigades had instilled among rural people over the decades would have made it impossible to create a working relationship in their presence.

Control of the rural firewood markets, instead of being the responsibility of the forest brigades, was transferred to the administrative arm of the forest service. This had formal control over the type of wood harvested, including diameters and species, the amount of wood stocked and sold with respect to the quota, the coupons issued and the taxes paid. The incentive for villages to stay within the rules was that failure to do so would lead to withdrawal of the market licence with its economic consequences and vulnerability to brigade raids.

During the project, these arrangements were respected but, after 1996, a number of brigades resumed their raiding. Even when a market meticulously obeys the rules and keeps impeccable records, a brigade can always find an excuse to fine, arrest or impose whatever penalties it wishes.

Since the rule of law has little meaning in the relationship between villagers and brigades, a range of other illegal practices has been reported. They include the falsification of documents of rural firewood markets, illegal confiscation of those documents and in some cases, their destruction to avoid independent audits. Another trick is to arrest and detain, effectively ransom, village leaders who are only released when the brigade is paid. In yet

other cases, the firewood markets have been fined at the rate of the monies available in the Village Fund; sometimes with delivery of a receipt, in other cases without. Finally, money has simply been stolen from the various funds without any reason or justification beyond the possession of an automatic rifle.

In the past, governments and development agencies kept their eyes closed against evidence of this type of behaviour. With the advance of decentralization and more democratic governance since the 1990s, such matters are becoming much less tolerated. Forest services are now finding that they have to profoundly reform their behaviour, or lose responsibilities to the other rural institutions which are now rapidly emerging.

## **B. FUTURE DIRECTIONS**

In both Niger and Mali, the intention is that forest management, with the exception of gazetted forests, will be transferred from the state forest service to local government. While this is desirable from a democratization perspective, it must also be noted that it is not free of risks. Both government and village representatives have expressed concerns about the type of forest management which might be put in place by local government authorities such as the communes.

One worry is that cash shortages, such as the need to pay teachers' salaries, may impel the local authority to exploit a forest for short term gains rather than manage it for the long term. It is therefore important that the decentralization process does not stop at the level of communes and that real powers to protect their own interests are retained by local communities. This is exactly what the rural firewood markets intend to do.

Whatever the final outcome, decentralization offers exciting opportunities for the firewood markets. The main institutional difference from the present situation is that the local government authority, such as the commune, and not the central forest service, will monitor the markets. The forest service will finally be enabled to concentrate on technical matters and extract itself from the vicious circle of control and rent seeking. It will, of course, remain directly responsible for the gazetted forest estate which, in itself, is a formidable task.

## **VIII. BROADER POLITICAL STRUCTURES**

In the late 1980s and beginning of the 1990s, when the rural firewood market concept was being developed in Niger, it offered a model of decentralized control of firewood production in a context of a highly centralised political administration. The rural firewood market was, in effect, a politically pioneering concept, a fact which imposed certain significant constraints on the design of the project.

As a result, the project was presented primarily as a domestic energy initiative. The implications of its radical provisions for devolution of control from the centralised forest service to local communities, in effect, a profound innovation in land-use control, were, probably deliberately, downplayed.

Now that a general process of political and administrative decentralization is well under way, such reticence about the underlying thrust of rural firewood markets projects is no longer necessary. The time is opportune for a fresh look at how the rural firewood market

system fits within the new political framework. This could lead to improvements in the design of the markets, enabling them to function more effectively themselves, as well as contributing to the decentralization and democratization process.

## **A. LEGAL FRAMEWORKS**

The creation of an enabling legal framework has generally been a precondition for the disbursement of donor funds for rural firewood market projects and the various *gestion de terroir* programmes carried out since the early 1990s. Order No 92-037 which provides the legal framework for the Niger Household Energy Project is one such governmental response to donor pressure.

Where such legal frameworks are not fully compatible with the country's overall legal structures, however, their efficacy tends to be limited. They may meet the donor's requirements but unless they are truly in harmony with the overall national legal system, they will carry little judicial weight and may, indeed, make little sense to the local communities involved.

Local committees established under the terms of such project-specific laws or regulations may consequently have little real authority or responsibility. They cannot be held legally responsible for any funds collected nor do they have legal authority over the natural resources which many of them are expected to control under the programme. The result is that no court of justice can process complaints against malpractice by a market management committee or the abuse of forest management funds, since neither the committee nor the forest management fund are recognised by law.

The local management structure of the rural firewood markets in Niger is an example. Order No 92-037 mentions that the Village Assembly is responsible for the Village Fund and the Forest Management Fund. The Village Assembly, however, has no formal legal existence in the country. At this level of the administration of rural society, only the traditional Village Chief is mentioned in law.

Despite the fact that the first rural firewood markets were set up in Niger in 1992, the last stage of registration has not been completed by the forest service and none of the markets have received the *Agrément* document which confirms their legal existence. The consequence is that a court of justice would not be able to recognize them nor the village assembly which is supposed to oversee their financial affairs.

It might be argued that such legal technicalities are of little relevance in rural disputes in countries such as Niger and Mali, where traditional authorities and local power structures, rather than legal niceties, tend to be the deciding factors in rural disputes. The experience gained to date with the rural fuelwood markets, however, suggests that improved governance is absolutely necessary if they are to become successful and durable organizations. One of the preconditions of such governance is a clear legal framework of authority, responsibilities, and sanctions.

The encouraging fact is that the necessary legal structures for improved governance are gradually being put in place. A first attempt to establish a legal framework for village organizations has been made in Niger where lawyers have produced draft legislation covering the establishment of the village assembly and other local organizations and defining their responsibilities. The draft legislation has, however, been with parliament for several years

and is unlikely to be passed until the overall political decentralization has progressed further and the relationships between the commune and the village have been clearly defined.

In Mali, the nature of village institutions such as the general assembly are still under discussion but the communes are a reality since the elections of 1999. The commune mayors are now a major political force in the rural areas. It is still too early to make any assessment of what impact this is likely to have on local natural resource management but it is, perhaps, of significance that the communes have shown a willingness to collaborate with each other. In one area, the mayors of a number of communes, with some support from SOS Sahel UK, have worked out a collective agreement with farmers and pastoralists on main cattle routes and pastoral zones.

The concept of a “Community of Communes” is important since it permits local governance to be scaled up where this is necessary. In Mali’s 5<sup>th</sup> Region, traditional forest management institutions, called *Alamodiou*, and the mayors have started working together, the first providing the necessary village-level legitimacy and the second the formal legal framework.

The relations between communes and villages in forest management matters, including rural firewood market structures, are not yet clarified in Malian law though the government envisages a gradual transfer of authority and capacities from central to local government. The most debated formula is a contract between villages, represented by the village assembly, and their commune in the form of a long-term concession of the village forest, a legal arrangement which would be quite compatible with the rural firewood market. The present legal position, however, is that if any legal dispute were to arise, the court would be unable to recognize either the village assembly or the market.

The lack of an appropriate legal framework is most markedly felt when local organizations are made responsible for the management of cash funds. This is becoming increasingly common in development projects. Examples include locally run rural water schemes and health or education facilities which are managed at the community level. Many of these schemes operate accounts which may include a community fund of the kind set up under the rural firewood market system. All these types of projects, including the firewood markets, require a proper legal framework within which the local organizations can operate and be held responsible for the funds they handle and the fulfillment of their obligations.

## **B. MARKET ASSOCIATIONS**

Woodfuel traders and forest brigades are relatively well organized and have town based connections which provide a great deal of leverage. The individual rural firewood market structures, in contrast, are in a weak position. An interesting and potentially significant development in Niger, Mali and Burkina Faso is the spontaneous emergence of associations of market operators.

These associations give market operators a better chance to resist external pressures. They tend to fulfill three roles: to exploit economies of scale, to help resolve disputes between market operators, and to provide some collective strength in conflicts with firewood traders or the forest service. The economies of scale may include the pooled purchase of permits and exchange of stock, for example, in filling a firewood truck when stocks are low. Confrontations between market operators typically concern tenure conflicts and the market association can play a valuable mediating role.

Another important role is in providing protection against forest agents. In Say, in Niger, 51 firewood markets got together in 1998 to form an association to rid themselves of a highly corrupt forest brigade. An association in the Kelka in Mali helped thirteen village organizations to reduce the pressure from town-based wood-cutters. An association of forest management organizations in neighbouring Bankass allowed villagers to ward off punitive raids by the forest brigade in 1998. In the palm tree belt of Gaya, in Niger, associations of village management organizations now negotiate with the local administration from a position of strength. An association of chantiers in Burkina Faso finally managed to break the price monopoly of the Ouagadougou-based traders and increase producer prices.

Market associations may find long-term survival difficult if they are left on their own without legal or administrative support from government. If, however, they receive support from the administration and elected local government, they could well become a turning point in Sahelian forest management.

### **C. PRIVATE OPERATORS AND NGOS**

The ability and effectiveness of private operators in supporting local communities in developing new firewood markets is now established. A more recent idea is that private operators should become the third party in the relationship between forest agents and local communities so that the habitual control functions of forest agents are monitored by a private operator. While there is still a long way to go in making such ideas work, the present experience with private enterprise in the traditional energy sector offers some practical clues.

In both Mali and Niger, private operators have demonstrated a high level of commitment to the rural firewood market system. They have no direct responsibilities for taxation, confiscation, penalties, or production of coupons and they have nothing to gain from these activities. Their loyalties and rewards are linked to the successful establishment of rural firewood markets under the contracts they obtain from donor-assisted projects. Far from colluding with corrupt practices, private operators have tended to help contain abusive practice. Today, monitoring reports highly critical of abusive forest control are produced and circulate, and they originate from private operators. Such reports were unthinkable five or ten years ago.

In Kita, the experience of forest service agents controlling the markets has not been positive and the project decided to engage eight contractual staff to improve the monitoring of markets. The contractual staff also serve as a third force in the relationship between communities and the forest agents. GTA, the private operator in Niger which has been contracted by the Household Energy Project to monitor all firewood markets, is, for example, inevitably involved when markets have been subjected to serious abuse by forest agents. Although the presence of such a third party or witness to corrupt behaviour can be beneficial, in the absence of a legal framework, the support can only be temporary and informal.

The role of private operators in the tax collection system around the cities is a new debate. In Mali, the idea of a new organization charged with tax control in the firewood chain, independent of the forest service, is beginning to gain support though the modalities are as yet vague. Niger has a promising example of road toll collection, which has been privatized for some time. The tax collection rates are better now than in previous years, when it was carried out by government staff of the Ministry of Transport. But a great deal more



work needs to be done before privatization of tax collection can be considered a realistic option.

## **IX. CONCLUSIONS**

The rural firewood markets are a major step forward in Sahelian natural resource management. After decades of failed, or highly disappointing, forestry projects and programmes, the rural market concept has opened a new way forward and created possibilities for a wide variety of initiatives. In empowering local people, putting responsibility for local resource management with those who stand to gain, or lose, most from it, the markets are also making a significant contribution to the overall processes of decentralization and democratization taking place in the Sahelian countries.

There are, nevertheless, important questions and issues which still need to be addressed. These are matters of major concern to policy-makers, governments seeking to balance the many internal and external pressures upon them, and the major donor agencies who, alone, can provide the funding for large scale development initiatives in the poorest countries.

### **A. REACHING A CRITICAL LEVEL OF IMPACT**

There are legitimate concerns about the slow spread of the firewood markets in Niger and in Mali. In Niger, the number of markets has increased slowly, if at all, over the past five years – the major achievement is that those in existence have survived without project support. In Mali, the number of markets supplying Bamako has increased substantially but at a slower rate than that of firewood consumption so that their proportional contribution to the total supply is falling. These are negative indicators if the success criterion is the number of markets and proportion of total wood energy consumption supplied by them.

It is, of course, important that the rural firewood markets become a major force in the commercial firewood. But at this stage in their development it is not realistic to judge their success purely in numerical or quantitative terms. As the analysis in the previous chapters has shown, the markets are subject to the various weaknesses in the fiscal, administrative and technical framework within which they are functioning – as well as the pressure exerted by corrupt forest agents. It is a measure of their inherent relevance to the issues they are addressing that they have managed to survive and prosper as they have done.

The priority task is not to increase the numbers of markets but to refine and develop the market model and to improve the legal and administrative framework within which the markets work. Experience to date suggests that expansion of the role of the private sector will bring a range of benefits including lower costs, more flexible operation, greater speed of implementation and reduced corruption. The elaborate planning exercises based upon SDAs, the imposition of harvesting quotas and complex differential taxations systems can be simplified or dropped completely bringing cost reductions and greater ease of implementation. Fiscal policies which, despite their intentions, put markets at a competitive disadvantage can be reformed.

The important question at this stage is, thus, not the number of markets but the framework within which they are operating. This will require legal reform so that markets obtain the legal protection and rights they need. It will require institutional reform to protect

and facilitate the functioning of the markets. If these requirements can be met, or can be seen to be moving positively, the markets are likely to spread rapidly.

## **B. DIVERSIFICATION OF ACTORS IN THE FIREWOOD CHAIN**

Up to introduction of the firewood markets, forest services had a near monopoly of control over the firewood chain. Town-based traders could muster financial resources but it was in their interest to collude with forest services in circumventing the various laws ostensibly intended to regulate the firewood trade. This is most clearly illustrated by the tax collection figures. With no checks or balances of any kind, forest service domination of the sector was complete. Rural people had no control over resource exploitation, gained virtually nothing from the trade, and served only as a source of frequently illegal financial gain for forest agents.

Political decentralization and the expanding role of civil society are now offering opportunities for a diversification of actors in the firewood chain. New actors include private operators in the establishment and monitoring of markets, even in the operation of control and taxation systems. Associations of market operators are beginning to show their strength. They have helped resolve conflicts between operators and, most importantly, have been able to resist bullying by forest agents and monopolistic behaviour by town-based traders.

The communes are likely to become a major actor in the firewood chain in Mali. In Niger, where they do not yet exist, the local district could play a similar role. One role which could be played by the district is in relating directly to the market management in the collection of taxes. This is presently carried out by forest officers who collect a 10 percent commission for tax collection, assuming no corruption; this could be retained by the market if it dealt directly with the district taxation officials.

The commune or district could also interrupt the chain of corruption by, for example, scrutinizing the flow of cutting permits and coupons. At present, the whole process is carried out and monitored by the forest service itself. The commune or district could also act as first recourse for market managements in dispute with forest service agents for which at present the only recourse is to the forest service administration.

Dealing with such deeply rooted institutional cultures and power structures is inevitably going to take time and effort. Progress will be facilitated by diversifying the actors involved. It would, for example, be helpful if independent and transparent auditing of forest service functions could be carried out, possibly with the help of independent civil society institutions or, initially, with support from reputable external donor-funded research organizations.

Attention also needs to be paid to the market structures themselves. It is important that they are also open to independent scrutiny to prevent fraud and abuse of power at a village level – to which they are by no means immune. This could be achieved by strengthening the role of market associations and formally assigning auditing functions to them. This would require serious attention being paid to their organizational and operating structures and ensuring that they are provided with the necessary legal and administrative support.

### **C. EFFECTIVE TAX POLICIES**

The complete failure of tax policies to date, despite the major efforts made under a variety of programmes, clearly suggests the need for a radically different approach. If, despite the best efforts of projects, only 10 percent of tax revenues are being collected, the taxation structure is achieving the reverse of that intended. Markets are being penalized rather than favoured.

The effects of such tax evasion and fraud are pervasive. In a context where tax fraud is the norm, markets will also participate in so far as the opportunities arise. The existence of illegal parallel firewood markets near designated markets is to be expected.

Given that 90 percent of the existing flow of tax revenues is either evaded or fraudulently diverted, the scope for private enrichment is large. For obvious reasons, the precise modalities of bribes and redistribution are extremely difficult to elucidate. Projects and development agencies, on their own, cannot expect to make a significant or lasting difference. Promises obtained as a condition of project funding being provided are unlikely to be fulfilled.

If real improvements are to be obtained, more imaginative and fundamental approaches than extra staff and vehicles for road controls are required. Indeed, the result of such conventional approaches, by providing increased mobility, may even be counterproductive if they are used for more effective resource extraction from rural areas.

One potentially effective approach is to increase the role of civil society institutions as discussed above. This is, for example, being used in a number of World Bank projects to combat fraud in the exploitation of Africa's tropical rain forests. Independent organizations are being used to carry out audits of what is taking place, introducing new transparency into areas of activity plagued by fraud and vested interests.

Reform of taxation structures is also required. The elaborate differential systems in place provide no advantages but introduce needless complexity and costs into the functioning of the firewood market system. One simplifying approach would be to abolish all taxes on markets but leave those on uncontrolled exploitation in place. While this, in itself, would not improve collection rates, it would ensure that firewood markets were removed from the taxation system, bringing the advantage of lower administration costs and increased freedom from interference by forest agents. At the very least, it would ensure that firewood markets paid no more tax than those who exploit uncontrolled zones; at best, it would provide them some measure of increased market competitiveness.

### **D. APPROPRIATE LEGAL FRAMEWORKS**

None of the rural firewood markets in Niger has yet received the *Agrément* certificate which establishes its legal status. Apart from the obvious fact that it increases the institutional vulnerability of the markets, this has serious functional implications. As the process of democratization and decentralization continues, additional actors are becoming involved in the firewood and natural resource management area. Disputes are inevitable. It is essential there is a legal framework within which they can be resolved, otherwise the orderly functioning of the whole system is at risk.

In Mali, the communes are already an established layer of substantially decentralized administration. They are likely to be awarded jurisdiction over the forests within their boundaries. The need now is for a legal framework and a definition of rights and responsibilities, which will enable operating agreements to be formulated between the communes and markets. One of the functions of such agreements will be to stave off concerns that the communes will be tempted to engage in over-exploitation of forest resources as a means of dealing with short-term financial problems. Such agreements could also act as models for similar relationships in other Sahelian countries.

#### **E. ENVIRONMENTAL SUSTAINABILITY**

One of the immediate benefits of the rural firewood market system is that it enables village communities to protect their local forest resources from irresponsible exploitation by outsiders. The question is whether local communities will be prepared to moderate their own exploitation and manage their local forest resources sustainably.

This touches on the long and deeply-held beliefs of governments and forest services that local people are driven entirely by short-term objectives and are incapable of such restraint or effective resource management. In support of such beliefs they can point to the fact that while many settled communities are willing to pursue and fine pastoralists, there are few records of similar treatment of community members breaking market rules or exceeding quotas.

The issue is, as usual, complex and there is little reliable data upon which to base conclusions. Although some of the markets in Niger have been in operation for almost a decade, the influences of fraud, over-complex operating rules, technical inadequacies in the SDAs, and other factors make it virtually impossible to make a judgement on how responsibly communities would behave in more favourable circumstances. The Malian markets have generally been operating for a shorter period making any conclusions even more difficult.

Nor has the challenge of sustainable management of forest resources in the context of an overall scarcity of firewood resources within the various firewood catchments had to be faced. Although the areas of exploitation of firewood resources are continually expanding, in most cases, even moderately effectively managed harvesting regimes are sufficient to preserve the regeneration capacity of natural forests. What happens when geographical constraints meet resource shortages and rising prices is a question which will need to be faced in the future.<sup>13</sup>

For the moment, the important question is how the markets match up to the previous system of centralised forest service control. To answer that fully, it would be necessary to carry out in-depth comparative studies of overall natural resource management performance in both market and non-market areas, something which has not yet been done. But it is, nevertheless, evident that the markets represent a broad improvement on what happened before. Responsibility for resource management in market areas now rests with those who have most to gain and lose from it. That said, it also needs to be clearly recognised that the

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<sup>13</sup> Experience in some countries suggests that, under such conditions, fuelwood supplies tend to come increasingly from management of on-farm trees.

rural firewood markets are not a miracle all-in-one solution to the problems of population growth, urbanisation, the need for expansion of agricultural production, and drought.

It is also necessary to place firewood production within its proper context. A market which sustainably produces firewood at the expense of other, perhaps far more important, local benefits from the forest areas is not an optimum solution. In resolving such questions, and maximising the overall benefits at a local level, the move towards democratization and decentralization is vitally important. It creates the context within which the locally important trade-offs can be discussed and agreed between those most affected by them.

The issues of long term environmental sustainability and inter-generational solidarity also need to be placed in context. With economic growth, urbanisation, rising populations and technological change all taking place, relationships with the environment are changing all over the world and will do so in the Sahel. The aim must be to ensure that the resource base on which local people rely is not undermined and that change is managed as benignly as possible. But miracles of self-denial cannot be expected from hard-pressed rural people in a world where some of the richest nations provide some of the poorest examples.

#### **F. REALISM ABOUT FIREWOOD PRICES**

In the past, urban-based firewood traders were given virtually unfettered access to natural forest resources without regard to local interests or long-term resource sustainability. Today, fuelwood traders are coming under increasing pressure. The expansion of firewood markets means they have to pay more for firewood; restraints on over-exploitation means they have to travel further for supplies, at least in the short term. Taxation systems may even become more effective. The inevitable consequence is that firewood prices will rise.

This means that some of the external costs of firewood production will be internalised. While this makes economic sense and is a necessary element in making supplies sustainable, it is hardly what many firewood market projects envisaged as an objective. The prospectus for many such projects has been that they would make firewood supplies both sustainable and cheaper for the urban poor. This is likely to be impossible to achieve. Sustainable forest management is almost certainly more expensive than short term uncontrolled exploitation. A sense of realism about prices needs to be maintained.

#### **G. CAN FOREST SERVICES BE REFORMED?**

In the case of Niger over the last decade, the forest service has not been able to significantly evolve from its traditional role of a paramilitary service dealing with control and extraction. The examples of fraud and extortion in the market system are numerous and the tax collection rates speak for themselves. This does not mean that there is no willingness to embrace reform at senior administrative levels. The problem lies in the structure of a widely spread, under-resourced, and poorly-paid institution in which, even with the best of intentions, forest service professionals in Niamey or Bamako cannot exercise effective control over the activities of their agents in the vast expanse of the Sahel.

It is therefore essential that the worst aspects of the forest service tradition are confronted and extirpated. Experience has shown that having the forest service exclusively in control of the development of rural firewood market projects is almost entirely counterproductive. Given the current institutional structures and in-built ethos, especially of

forest brigades, the provision of vehicles and resources simply increases the ability of unscrupulous agents to terrorise and extort money from local communities. Even if such excesses can be prevented, the poor relations with rural communities plus their own bureaucratic inefficiencies, mean that forest services are most unlikely to be effective in establishing rural firewood market networks.

The encouraging development is that, with democratization and decentralization, other civil society organizations are beginning to emerge. Local government structures and civil institutions, including the rural firewood markets, are gradually taking responsibilities in resource management, conflict resolution, and social issues which in the past were supposed to be handled by a vastly overstretched forest service. It can, indeed, be argued that it is precisely this degree of overstretch and under-funding which has led to the worst aspects of forest service behaviour. The hope is that change can be managed in a constructive manner.

Foresters represent one of the best trained professional groups in many of the Sahelian countries. They have acquired a great deal of knowledge on ecology and resource management which will be in high demand by local government, research institutions, NGOs and private sector companies. Already the first steps are being taken and many foresters have found challenging positions in new organizations or institutions which have been engaged in the establishment and monitoring of firewood market projects.

As the process of divesting forest services of responsibilities which they cannot fulfill continues, they will be able to concentrate on those fields where their real expertise lies including research, overall forest policy and the management of gazetted forests. These will provide opportunities for donor funding and the further development of solid and relevant skills within the forest services.