

SENEGAL REFORESTATION PROJECT

USAID NO. 685-0283

END OF TOUR REPORT
TREE PRODUCTS STUDY

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prepared for the

DIRECTION OF SOIL CONSERVATION AND REFORESTATION

by the

SOUTH-EAST CONSORTIUM FOR INTERNATIONAL DEVELOPMENT
(SECID)

and

LOUIS BERGER INTERNATIONAL, INC.
(LBII)

(GOS Contract No. 24 for Technical Services)

APRIL 1989
DAKAR, SENEGAL

EXECUTIVE SUMMARY

The Tree Products Study as proposed in the consultant's first report of August 1988 was carried out under contract during December 1988 and January 1989. The study was country-wide and consisted of questions addressed to department officials of the government's agencies concerned with forestry, agriculture and livestock. The questions were principally about tree products used and marketed by the farm population. A number of other pertinent subjects were included, and enquiries were made in local markets regarding tree products for sale.

This report summarizes and analyzes the data gathered by the Tree Products Study. It further draws conclusions therefrom and makes recommendations.

The principal conclusions are the following:

The rural population has a wide variety of tree species (70 mentioned) whose products are used for human and livestock nutrition, and for pharmaceuticals;

A wide variety of tree products appears in the local markets, but tree products are not an important source of revenue to the farm population. They are mostly consumed within the farm enterprise;

Most of the trees supplying such products grow wild without special care or planting;

The principal constraint to further planting is the need to protect planted trees from free-ranging domestic animals;

Re-organization of the charcoal industry has potential for motivating farmers to plant trees and increase their revenues.

The principal recommendations are the following:

Endeavor to increase the range of tree species offered for on-farm planting, with emphasis on multiple product species of interest to farmers;

Broaden the concept of reforestation to include the natural re-growth of on-farm trees and woodlands;

Use the matching grants to encourage comprehensive planning with agriculture and livestock;

Establish several trial fuelwood plantings with guaranteed markets and prices with a view to reorganizing a charcoal industry more favorable to farm participation;

Establish a system of regular reporting by the ministry's field staff of tree product marketing and sales.

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1. BACKGROUND OF TREE PRODUCTS STUDY

The Senegal Reforestation Project's Project Paper contains several assumptions from which the need for a Tree Products Study logically follows:

- the strongest motive farmers have for planting trees is the possibility of revenue from the sale of their products;
- there exists in Senegal an abundance of native and introduced tree species with a wide variety of useful products;
- the increased sale of such products can add significantly to farm income and thereby motivate planting trees;
- the potential for tree products is large but as yet not well known in detail.

The SRP therefore provided for study of tree products designed principally to enquire into:

- tree species and their products,
- the important uses of tree products and the revenues they bring to the farm enterprise,
- the attitudes and problems of farm families toward trees and their products,
- how tree products are marketed,
SRP awareness, and
- what are the constraints to increasing the output, use and sale of tree products.

The purposes of the study were to identify opportunities for increasing rural welfare through tree products and to guide the SRP toward the objective of widespread reforestation by farmers using primarily their own resources.

The results expected of the proposed study were :

1. The project will have current and country-wide knowledge of tree products and representative local markets from a variety of sources.
2. the study will reveal the comparative importance of different tree products and possibly identify some whose on-farm production and marketing potential are not now known.

3. Officials of four key ministries that deal with the rural population will reveal their knowledge and attitudes. Such information will be useful for advancing project objectives.
4. The project will have a country-wide insight into the problems and attitudes of rural people toward trees and their products as parts of the agricultural system.
5. The study will reveal where information about tree products is lacking and thus guide further studies.

Senegal is well endowed with indigenous tree species, some 370 in all. Another dozen or so exotic species have become important. Trees have long been part of the traditional farming systems. They and their products have entered Senegalese life in many ways, both urban and rural. It therefore seemed advisable that the study be country-wide, as is the SRP itself.

2. METHODOLOGY

Given the limits of time and budget and the broad purpose of the study, it seemed most appropriate to seek information from a limited number of uniform sources, but country-wide. The sources chosen were officials of the Ministry for the Protection of Nature and of the Ministry of Rural Development. Within the Government of Senegal, those two ministries are closely associated. Officials chosen for interview were specialists in forestry, agriculture and livestock, in each case the section chief at the department level. The department level was suitable because:

- Senegal has thirty departments. Contacts with three officials in each therefore gave country-wide coverage within reasonable limits of time and expense.
- Officials were able to give information from a professional background and from experience. They showed in most cases a broad grasp of the problems of rural life. Where they were newly arrived and unfamiliar with the locality, they called in subordinates who were familiar.
- The department level proved to be appropriate for identifying broad but manageable supply and marketing zones.
- The department level is the lowest at which the project keeps country-wide contact with the field

staff of the Ministry for the Protection of Nature.

- By making country-wide visits, the enquirers who carried out the study were able to visit at least one market in each region and report on the presence and variety of tree products on sale.

The Tree Products Study consisted of 35 questions and market enquiries at ten regional capitals, organized as follows:

- Tree species and uses of their products.
- Care of trees and sources of seed and planting stock.
- Cultural significance of trees and forests.
- Tree product markets and revenues to farmers.
- Knowledge and influence of forestry code.
- Enquiry into tree products at regional capitals.

With 35 questions and three officials interviewed at 30 departments, there were 3150 responses. The data so recorded have been entered and summarized by computer and appear as annex IX of this report.

The field work for this study took place during the months of December 1988 and January 1989 under contract with:

Groupement d'Intérêt Economique
Siège No. 364 Notaire Guediawaye
Dakar, Sénégal

3. ANALYSES OF DATA

3.1 Tree Species and Uses of Their Products

Questions number one and number two asked the respondents to identify the tree species in their department which supply human nutrition and to name the parts of each such tree species which are so used. The results of the enquiry the number of different species named to be 63 and parts of the tree and the number of times each was mentioned as follows: leaf (28 times), pod (8 times), bark (15 times), bark (15 times), fruit (49 times), sap (17 times), root (7 times), oil (4 times), and flower (1 time).

All departments showed a high incidence and variety of tree products used for human nutrition. Regionally the lowest

was Dakar with uses named 28 times and the highest was Ziguinchor with 107 times.

Baobab received most mention. That species grows in all parts of Senegal and everywhere receives the protection needed for continuance by spontaneous seeding and growth. Thirteen other species received mention 20 times or more. (See Annex V).

Tree products are thus important sources of human nutrition in all parts of the country, but from wild rather than cultivated trees. The species which supply them are not those commonly offered for reforestation. They are used to supplement otherwise monotonous diets from field crops. It is not now possible to make useful estimates of quantities consumed; but their value is partly due to their concentrated nutritional content and to the regularity of yield independently of climatic variations from year to year.

Questions three and four proposed to find out which tree species supply forage for livestock. Trees are particularly important in this respect because their products are available during the dry season when grasses, forbs and stovers are no longer available. About one third of the total food intake of livestock is thought to come from tree parts.

The answers showed that all parts of Senegal have important tree sources of nourishment for livestock. Forty (Annex V) tree species received mention whose leaves are palatable to livestock. Of these, 18 have edible fruit and four have edible pods as well. Although suitable for planting (Annex IV Reference I), fodder trees do not receive enough attention in reforestation projects.

Other very important uses for tree products are pharmaceutical. Such uses are the outcomes of traditional and collective experience over many centuries. Whatever their curative value, they constitute deeply-rooted cultural and emotional links between trees and the population, both urban and rural.

Therefore, questions five and six asked what tree species and which parts of those species are used for curing ailments and relieving pain. Forty-seven species received mention (Annex V). The most commonly mentioned was the baobab, followed by the tamarind and the sump (Balanites aegyptica). The most commonly used parts of the trees are the leaves, after which come fruit, bark, roots and sap.

Questions 1-6 identified 70 tree species (Annex V). Of those species, 62 have products useful for human nutrition, 40 for animal nutrition, and 47 for pharmacy. The list indicates

the range of species available for further investigation as sources of revenue and welfare to the rural population.

The Tree Products Study was designed to identify tree species with multiple uses and thereby acceptable to farmers for widespread planting and protection. The questionnaire began with uses for food, animal forage and pharmaceuticals because those products are very close to the daily lives of rural people.

Question number seven went further in asking what species have other uses and what those uses are. Thirty-five tree species received mention (Annex V). The commonest additional uses were firewood (140), construction (116), rope (59) and windbreaks (49). Honey, tanning, fencing, poles and soil-enrichment also appeared. The tree species appearing most often was baobab, followed by sump, the Borassus palm, kad and sedem.

The answers reveal the wide range of multi-purpose trees among which the genera Adansonia and Acacia are outstanding.

3.2 Care of Trees and Sources of Seed and Planting Stock

There is a strong tradition in Senegal as elsewhere that reforestation takes place only by planting trees. In fact, trees and forests very largely re-plant themselves. Given the expense and uncertainties of planting, it seemed worthwhile to enquire which species among those cited appear spontaneously. The officials queried named 69 species which seed and grow without human intervention, of which they named 15 as also planted. (Annex V) The answers suggest reforestation in the wider sense of attention to spontaneous re-growth of trees and forests becoming part of the SRP so as to take more advantage of the regenerative power of the native tree species.

The purpose of the next question (9) was to find out how much and what kind of attention farmers give to protecting the trees which they find growing on the lands they control.

Such trees are the origin of most the tree products considered so far. Twenty-three officials cited protection, but pruning, weeding and fencing also were among the answers. Half of the foresters were aware of such care. The answers may surprise those who believe that farmers have a negative attitude toward trees. Nevertheless the answers also suggest that promoting such attention and protection of spontaneous trees on farmlands finds a basis in traditional farming systems and attitudes of farmers. It can be developed through the media, training and extension aspects of the SRP and used to bring about the widespread re-growth

of tree cover. It is particularly important in regard to tree products mentioned in answer to questions 1-6 because most come from spontaneous rather than planted trees.

For many years the strategy of reforestation in Senegal was planting seedlings of exotic species, seedlings grown and distributed free of charge from tree nurseries of the Forestry Department. Lately more planting stock has been available from private, village and project nurseries. Question 10 was therefore intended to find out the extent to which officials at the department level are aware of the different sources of planting stock.

The answers were revealing. Fourteen foresters, 19 agriculturists and 19 livestock specialists had no answer at all. Of the 38 who replied, 32 named nurseries of the regional forestry offices and six those of a research agency (C.N.R.F). Perhaps the respondents misunderstood the question. In any case private sources of seedlings have yet to make an impression upon public officials. The answers suggest that they are not well prepared to respond to the large increase in planting stock which the national forestry plan will require.

Another aspect of reforestation which has not received enough attention is the extent to which farmers have sources of seeds and seedlings available to them on their own and nearby lands. Those seedlings cost nothing and are perfectly adapted to the site where they grow. In less than ten years, Senegal will need 50 millions seedlings each year to reach the stated annual planting goal of 70 000 hectares. Surely wildlings can help if farmers receive encouragement to look to their own resources and save about one third of the cost of planting.

3.3 Cultural Significance of Trees and Forests

Wherever trees and forests grow they acquire cultural and emotional links with the near-by human population. The links do not always come about because of usefulness or abundance of the trees. The factor may be size or longevity. Thus questions 11 - 14 appear in the questionnaire to find out which sources of tree products have cultural and emotional links and how those links are expressed.

Of the 88 who replied, 48 recognized the cultural significance of trees ; 19 foresters, 13 agriculturists and 16 livestock specialists. Forty-two either misunderstood the question or chose not to admit that trees very clearly have more than economic and ecological value.

Therefore question 12 asked which trees were culturally important and in what way. Of the 17 species (Annex V)

receiving mention, baobab received 18 citations and ceiba seven. Among the 15 others, no one species received more than four. Their cultural significance appears in connection with religious rites, gathering places and the naming of villages.

Questions 13 and 14 inquired about the presence and area of sacred groves such as are found principally in the Casamance and Senegal Oriental. Sacred groves involve secret societies and cults which pre-date Christian and Muslim influence. Some information was forthcoming about their presence but none about their area. Apparently a certain reticence surrounds them. Exploitation is forbidden and even access, except to those initiated into the cult. For that reason one cannot look to them as sources of tree products.

3.4 Tree Product Markets and Revenues to Farmers

Given the premise that farmers react to market opportunities, the Tree Products Study endeavored to find out which tree products enter commercial channels, in what ways, and what they contribute to farm income. Respondents were also asked to identify constraints on farmers to planting trees for income and to suggest ways to increase farm income by the sale of tree products. Furthermore an enquirer visited the public market in each regional capital to observe and record what tree products were on sale and their importance. (Annex V)

Question 15 identified 45 tree species (Annex V) which officials think add to farm income, a number reasonably close to the 54 tree species whose products appear in the market. The baobab was noted 60 times while seven other species received mention over 20 times each. The genus Acacia was represented by six species. The regional breakdown showed that all regions have an abundance of tree species with useful and marketable products.

The next two questions (16 and 17) asked about the different marketing channels available for farmers to sell tree products and the relative importance of each. All but four officials recognized local markets as being available; 60 more mentioned intermediaries and 32 sales to neighbors. When asked to specify which was most important, 64 mentioned markets, 41 interme- diaries, while only four mentioned neighborhood sales. Evidently several marketing channels are available whose products on sale are known to public officials. They did not mention agricultural marketing cooperatives or forestry cooperatives. Perhaps the quantities and sums involved are too small to interest either. Local markets are apparently the most important outlet for tree products. Thus facilities at such markets

are important ; facilities such as shelters, sanitation, safety, supervision over weights, quality and in other ways.

The next two questions (18 and 19) asked which marketing channel brings in the most revenue to the farm population from the different categories of tree products such as food, forage, medicine or others. The answers to question 18 indicate that it was not understood as referring to marketing channels but to the importance of the different categories of tree products in generating farm income. The respondents named tree products for human nutrition 16 times, for animal fodder 19 times, for medicine 16 times, for charcoal seven times and for poles once.

Tree products for animal nutrition are very important, especially to the Peuls ; but apparently they do not enter importantly into marketing channels. Charcoal is by far the most important tree product in Senegal in terms of total market value and in terms of quantity of wood used except for firewood. But charcoal is important enough to have created a production and marketing system which largely bypasses the local farm population where it is produced.

Firewood is without doubt far more important than charcoal in terms of the quantities of wood. It is an item essential to almost every rural household. Nevertheless the answers given to questions 18 and 19 reveal that firewood does not enter commercial channels in any way important to farmers. Each household takes freely what it needs from common lands. Those households which do not have access to common lands are mostly urban and commonly use charcoal.

Question 20 endeavored to find out which family members gather tree products for sale and question 21 (a), the importance of these sales to the farm income. The first question indicated that such gathering is largely the task of women and children. The answers to the question about income from the sale of tree products were the following. Twenty-seven officials thought tree products were important, 32 thought that their importance was small, and 25 gave incomplete answers referring to variations in importance because of annual climatic factors. The regional breakdown showed the greater importance in the Casamance and Tambacounda.

Two explanations for the incomplete answers may be that farmers are notoriously reticent about their incomes, especially before public officials, and that the officials are not aware of economic factors. Their interests are technical. Therefore as sources of commercial information they are of less value than as sources of knowledge about tree species and their products.

The next six questions enquired about charcoal and firewood. Those two items account for all but a small part of the six million or so cubic meters of wood used in Senegal each year. Comparing the answers to questions 1-7 and those to the questions about markets and sales (15-21) indicates that tree products other than charcoal are more important for on-farm consumption and use, than for sale. If tree products are to increase farm revenue significantly, they will have to do so in the form of wood and charcoal.

The second part of question 21 (Page 17 of the questionnaire in Annex VI), asked whether firewood was an important source of revenue for the rural household. The responses were 48 "yes" and 40 "no", with two abstentions. When further asked to explain their answers, those who had answered "yes" said that every household uses firewood. Those who had answered "no" said that families gather firewood, each one for itself. In such cases, no monetary exchange takes place to create revenue.

Those who answered "yes" were probably thinking of the importance of firewood to the rural household rather than to monetary income. Several reasons for thinking so are the following:

- no official in his comments cited any monetary revenue
- firewood is available from public lands without charge
- the forestry code has restrictions on the sale of firewood gathered on public lands
- urban households without access to free sources of wood fuel use charcoal rather than firewood
- when asked in question 22 about increasing farm revenue from firewood, 63 officials had no comment
- firewood has traditionally been a free good outside the exchange economy.

The following points came out in the comments:

- the use of firewood is nearly universal in rural households
- the households look upon firewood as a good freely available but not as a source of revenue.

Since firewood is such an important tree product, the next question (number 22) asked for suggestions as to how farmers could receive more income from the sale of firewood. Sixty-three officials had no comment. Six asked for a more

flexible forestry code and 15 for farmer cooperatives capable of marketing tree products.

Although those two suggestions have merit, the lack of responses in 63 cases indicates that the officials do not look upon firewood as a source of income to farmers or as a farm crop to be grown, sold and replaced as part of the farm enterprise. The general thought of those who answered was that the forestry code is restrictive and that there is a lack of organized marketing channels for firewood such as there is for charcoal. Two further factors influence their attitudes; namely,

- the tradition that firewood is a free good that one picks up on vacant land but does not sell without permit from the Forestry Department
- propaganda weighted toward planting trees and their ecological value but very much less toward their economic value in supplying energy,

Even in the case of the 23 affirmative answers, there is some uncertainty as to whether the respondents were referring to true farmers who cultivate the soil or to rural people generally, who would include those who specialize in charcoal-making and perhaps other woods work without having permanently important ties to cultivated land. In traditional Wolof social structure such a class of woods-workers existed known as "laobé". It probably has not entirely disappeared but has been continued by immigrants from Guinea Bissau. (Annex IV Reference 2)

The departments of Kolda and Velingara received affirmative answers in all cases, indicating them as the most active in charcoal production. The third department to receive frequent mention was Tambacounda.

In all case the answers must have been referring to off-farm work because practically all charcoal is made from trees on land officially designated as national forest.

Questions 23, 25 and 26 had to do with charcoal. To the query : "Do farmers take part in the manufacture and marketing of charcoal ?", there were 65 denials and 23 affirmative answers. They indicate that as a source of employment and revenue, charcoal falls largely outside the farm economy.

What then will induce farmers to plant trees and grow wood for energy ? The triple gains to be had thereby are :

- less pressure on the classified forests,
- new sources of revenue for farmers,

- more trees on farm lands where they are most needed for environmental reasons.

Forty-six officials had no reply to question 26. Others indicated their perplexity as to why so important a tree product should bring so little revenue to the farm population. The thoughts most often advanced were bringing the business nearer to farm cooperatives and planting fast-growing species. Two suggested involving religious leaders and three noted the need for financial inducements.

Senegal's goal in the 1990's is the annual planting of 70 000 hectares, 50 millions trees. Fruit trees will never make up that number, nor windbreaks, nor poles, the three commons reasons now given for planting. Enough volume and money change hands only over wood energy to bring about such massive reforestation.

Question 27 asked the respondents to name the constraints on farmers to planting trees. The constraints so identified were the following, placed according to the number of times each received mention :

- Investment. The outlay for 625 seedlings (one hectare) is about 60 000 CFA for the planting stock, insecticide, tools and fencing. Fencing is about half the cost. If the planting is promoted as a cash crop, the returns appear to be distant, uncertain and low ;
- lack of technical knowledge on the part of both the farmer and the agent ;
- lack of suitable planting sites ;
- conflicts for time during the crop season ;
- negative attitude toward trees ;
- regulations over harvesting, transport and sale of tree products ;
- unavailabilily of planting stock ;
- price controls.

In Senegal animal husbandry is an important industry, deeply ingrained in the economy and culture. Moreover most native trees have leaves and often fruits which are palatable to livestock. Up to the time when they are above the reach of livestock, seedlings must therefore be protected from browsing animals. Tradition allows them free range over farm lands once the field crops are harvested. If the young trees do not receive such protection, their rates of

survival and growth are too low to include any inducement for planting them.

Such protection creates both investment and social problems. Wire fencing is too expensive for all but fruit-orchard trees. Brush fencing requires much labor and material which have other uses. Both materials are uncertain because wire may be stolen and brush fences need continual renewal and repair to keep them effective. Live fences are possible but also require labor and up-keep.

The social problem comes about because fencing out livestock conflicts with very deeply-rooted convictions as to the rights of animals to graze freely. Undoubtedly the trend is and must be toward closer herding, improved pastures and stable feeding. But in the meantime browsing is the most important constraint to the planting of trees by farmers.

The answers to question 27 identified seven other constraints. They all have substance, although none can compare with problems of animal browsing because none conflicts with such a pervasive and long-held conviction regarding open range. The SRP has provisions for overcoming them. For example,

- Lack of technical knowledge, The training programs
- Lack of suitable planting sites, Intergrating trees into the farming systems
- Conflicts during the crop season, Site preparation, fencing and digging holes before the crop season
- Negative attitude toward trees, The media program
- Regulations and price controls, The policy dialogue
- Unavailability of planting stock, Better and more forest tree nurseries.

Because of the conclusions drawn from the answers to question 27, this report recommends in Part 5 that the SRP's matching grant agreements endeavor to reconcile the reforestation and grazing conflict by cooperation with livestock interests.

The project's premise is that the prospect of revenue from tree products motivates farmers toward planting trees. Question 35 therefor asked officials for suggestions as to how tree products can be used to increase farm revenue. Of

the 90 officials queried, 25 had no suggestions. That so many, 27 per cent were unable or unwilling to comment on so basic a question suggests that in training the subject of revenue from trees (as well as their other advantage) should receive attention. Moreover among the answers were many in which revenue was irrelevant. They referred to cooperation between services, decentralizing and continuing reforestation projects and other administrative matters.

Among the answers referring more specifically to revenue, two preoccupations stand out. First, there were mentions of marketing channels, cooperatives and intermediaries, 25 in all, and all indicating dissatisfaction with the present situation, a dissatisfaction that does not appear in the answers to questions 16-18 on marketing channels. Second, 13 officials wanted to see more tree planting, especially of fast-growing species. However the answers did range over the forestry code, inter-ministerial cooperation, farm extension and the like.

Nevertheless the references to marketing are significant. Officials appeared to believe that where revenues from the products are really important, marketing channels through cooperatives are not available as they are for agricultural products and livestock. The important tree product for revenue is charcoal, and it fall very largely outside the farm structure. Were it within that structure, farmers would have an important source of revenue and employment which they do not now have. The mention of fast-growing species points to the same conclusion.

3.5 Knowledge and Influence of Forestry Code

The Project Paper included provisions for a dialogue on forest policy and the forest code because they can influence the attitudes and actions of both farmers and public officials toward trees and forests. The Tree Products Study Proposal Report of August 1988 Annex VI lists the four disicentives of the forestry code to the use and sale of tree products. (Annex VI)

The extent of that influence depends somewhat upon how well the provisions are known. Question 28 therefore enquired as to the farmers's awareness of the code.

Over half the respondents replied that farmers were not aware of its provisions. Probably to farmers the forestry agents whom they see and with whom they deal for permits, seedlings and advice, are the embodiment of the code as far as they are aware of it at all. The attitudes and actions of those agents are more influential than a code which uses complicated legal language foreign to them. They and the farmers are dealing with a code which officials think has no

incentives to planting trees but is a constraint thereto of itself. (Questions 29 and 30)

When asked for suggestions as to how the rural population could become better informed about the code, nearly half the officials asked had no replies. Many of the rest did no more than refer to education in general terms. But three points made are worth followings, namely:

- a simplified version in local languages;
- use of the rural extension centers (CER) for discussion and dissemination;
- participation of rural people in drawing up and enforcing a code which touches theirs lives in so many ways.

In view of the trend toward greater local participation in forestry affairs, all three are of interest, but especially the last. Senegal has long had a tradition whereby localities control their surrounding territories, including the trees, a tradition which could perhaps be developed toward better cooperation between the Forestry Department and the localities in bringing about more effective enforcement.

3.6 SRP Awareness

The purposes of question 32 - 34 were to find out whether the officials knew of SRP, what use they thought they could make of it, and how they would like to become better informed.

The answers indicate that officials other than those of forestry do not know about the SRP. Only eight out of 60 expressed any knowledge. Among the foresters 18 knew of the project's provisions and 12 did not. Moreover those who expressed an awareness were asked to explain what use they intended to make of it for the objectives of their agency in that department. The answers referred to general recommendations for any reforestation project (such as "decentralization") but not to specific provisions of the SRP. In the latter case, answers might have been:

- to propose candidates for training;
- to propose candidates for matching grants;
- to look for and follow through opportunities to market tree products;
- to keep the field staff informed about the project and encourage participation;

- to encourage private tree seedling nurseries.

All the officials showed an interest in participating in training courses, seminars and receiving written material.

3.7 Enquiry into Tree Products at Regional Captials

Each enquirer visited the market of the regional capital to find out the tree species whose products were on sale, which parts of the trees were most commonly on sale, and what level of marketing activity was occurring.

They found 54 tree species whose products were on sale (Annex V). The most common genus was Acacia, with six species represented (Annex V). The commonest species was baobab, found in all ten regions. Other common species found were :

dakkar	(<u>Tamarindus indica</u>)	9	regions
rat	(<u>Combretum glutinosum</u>)	9	"
kesen	(<u>Combretum micranthum</u>)	8	"
dimb	(<u>Cordyla pinnata</u>)	8	"
ul	(<u>Parkia biglobosa</u>)	8	"
sedem	(<u>Zyzyphus mauritania</u>)	8	"

The numbers of tree species whose products appeared in the market of each regions capital were the following :

<u>Region</u>	<u>Number of tree species</u>
Dakar	37
Diourbel	17
Fatick	20
Kaolack	18
Kolda	20
Louga	14
Saint-Louis	12
Tambacounda	9
Thies	20
Ziguinchor	20

The most frequent tree product for sale was fruit of which there were 135 citations. The next most frequent was leaves, with fifty. Other items far less frequent were roots, bark and sap. The most active market appeared to be in Dakar, followed by those of Casamance and the peanut bassin.

4. CONCLUSIONS

The Tree Products Study has revealed the values which trees create for farmers through the use and sale of their leaves,

fruits, bark, sap and flowers. Such values take many forms and come from a wide variety of tree species, mostly wild and mostly indigenous. They are important to rural welfare, but are used and consumed mostly by the farm household. Markets for such tree products are ubiquitous and offer outlets for a wide variety, but they are not an important factor in the total farm revenues.

The Tree Products Study sought information from the officials thought to be most conversant with rural life. They showed good knowledge of tree species and uses, and had important suggestions to make. They need to be made more aware of economic matters. As sources of information, the forestry staff can be improved if members make regular reports on the farm consumption and sale of tree products. The Tree Products Study should be helpful in programs of training and motivation, both for farmers and officials of the two ministries.

Analyses of the data collected show that the strategy of the study was appropriate to the objectives proposed.

Nevertheless further studies of tree products should conform to those suggested in Section 5 (Recommendations) of this report. The strategy proposed therein is for the field staff to gather information regularly so as to keep them interested and informed of trends in tree products use and sale and to guide the Ministry.

Senegal has a wide (70) variety of multiple-use tree species known to and used by farmers and the general public through their availability in markets. Although the number is only about one fifth of the total number of native tree species, it represents the collective experience and selections over many centuries.

Most of the tree species mentioned as of interest to farmers for food, animal fodder and pharmaceuticals are wild species growing spontaneously. Their close association with the farming systems used is traditional. Artificial reforestation with exotic tree species is relatively new and does not always fit in well with existing patterns of land use. Hence the conflicts over free-range browsing by domestic animals and the notable difference between the tree species identified as being of interest to farmers and those offered by reforestation projects.

The officials interviewed believe that farmers' principal interests in trees are as sources of firewood, food, animal forage and pharmaceuticals. When asked about other uses, they had little to say about how trees sustain the environment and increase the productivity of the farming system.

If Senegal is to reach the goal of planting 50 million seedlings a year, with acceptable survival and growth, new sources of seed and control over quality will have to be developed. The present system will soon be unable to meet the demand in quantity, quality and variety. Besides establishing a national seed office, the Ministry with project help should encourage farmers to locate and use seed sources found on their lands, and to give protection to spontaneous seedlings.

Trees and forests are parts of the Senegalese landscape, and have strong emotional and cultural links with the rural population. Such links offer an added dimension in giving their other uses publicity.

The most difficult questions to interpret and answer were those of sales and marketing channels. Farmers are reticent about discussing their revenues, especially before public officials. Those officials are not well informed on the details of farm income. The most important tree product in quantity is firewood ; but families most often gather their needs without payment. Charcoal falls largely outside the farm economic structure.

The most important constraint to successful tree planting is the expense of protection from free-ranging domestic animals. As planting and fencing (or whatever protective measure is chosen spread cumulatively toward the goal of 70,000 hectares of new plantings each year, a conflict between trees and animals may become explosive. The conflict is doubly unfortunate in that most Senegalese trees offer forage to livestock. Their planting and protection as seedling should receive the support of livestock interests especially if forage species are chosen for reforestation.

The rural population is not well informed about the forestry code and the regulations thereto. They contain no identified incentives to reforestation. Charcoal pricing policies treat wood as an economically free good and thus remove any incentive to grow it as a revenue-producing crop.

Officials showed an awareness of the problems of reforestation projects, but did not distinguish the SRP provisions from the 20 or so others forestry projects.

Charcoal dominates the tree product market in value and is second to firewood in quantity of wood consumed. Increasing farm

revenue from tree products means above all increasing their participation in the charcoal industry. It fits in well with their otherwise free time during the dry season, but the present structure of the industry excludes them.

The market study showed that a variety of tree products appear for human consumption and medicine. The study is indicative only and needs to be repeated over several seasons.

5. RECOMMENDATIONS

5.1 Senegal is aiming at planting 70 000 hectares a year by the mid - 1990's. The Tree Products Study has revealed the need for more varied, timely and better quality planting stock. A way to help meet the need is through a national tree seed office with responsibility for collecting, grading, storing and distributing tree seeds. More attention than at present should be given to provenance, quality of seed sources and genetic improvement. Among the results sought are higher rates of germination and survival, better adaptation of tree species to site, and faster growth.

5.2 The Tree Products Study has established a list of tree species (70 in all) whose products farmers use and in some cases sell. The species listed differ widely from those species commonly used for reforestation. There appears to be an important opportunity for broadening the range of species offered for planting and thereby integrating tree products into the farming systems by making available and advocating tree species whose products are familiar to and used by the rural population.

5.3 Over several decades and through many projects reforestation in Senegal has evolved through successive strategies and has established traditions; blocks of fuelwood, community woodlots, planting on farms. By dealing with farmers and stressing the interests which trees have for crops and livestock, the SRP stands in the forefront of integrating them better into farming systems and thereby creating a wider appeal to farmers.

Nevertheless the Tree Products Study has shown that to officials and to the rural population, reforestation has narrow connotations. Essentially the word means to them planting trees, mostly exotic, for purposes which are not part of their traditional farming methods. But reforestation only by planting trees is too expensive and uncertain to bring about the reversal of environmental degradation, which reversal is the SPR's primary, long-term objective.

The time has come to broaden the concept of reforestation to include attention to the spontaneous regrowth of trees and woodlands. The reference is not only or even primarily to protecting blocks of woodland. It is also toward awareness and care of individual trees. The Tree Products Study has

shown that such care does take place. Pélissier (Les Paysans du Sénégal) has argued that native trees have long had an indispensable part in sustaining agriculture. (Annex IV Reference 3)

Therefore the SRP through its media, training and matching grant resources should stress the broader concept of reforestation.

5.4 Even one year's experience with the matching grant program has shown that Senegal has more than enough farmers eager to absorb its matching grant resources by planting trees. Criteria for choosing among them and thereby influencing the direction of reforestation are being established and communicated to the field staff.

Question 27 of the Tree Products Study brought out a number of constraints to planting trees. The criteria can be used to direct planting toward situations where those constraints are most irrelevant. The best case in that of a farmer who

- has land available for planting (and can recognize such land) that does not compete with other crops
- can arrange his resources so that most of the work can be done without competition from other farm activities. Site preparation, fence-building and digging holes, about 60% of the work, can be done during the off-season.
- has available, can grow the seedlings needed, or can get them from a nursery
- knows how to plant and care for trees
- has shown that he can use and market tree products

With millions of farmers and millions of hectares to plant, the policy should be to set up models where the components are most favorable, where costs are lowest and the net benefits are greatest as examples to neighbors.

5.5 The most important constraints mentioned in answering. Question 27 point toward animal browsing as being the crucial factor to overcome in motivating farmers to plant and care for trees. There is no doubt an underlying though unexpressed conviction that successfully reforested land is that much less available for feeding livestock. Does Senegal really intend to block off 70 000 hectares a year to livestock? The situation is paradoxical where 48 trees species are identified as having forage value

and where trees have traditionally been so important a source of livestock nourishment.

Undoubtedly the purposeful evolution of farm forestry will be toward total farm enterprise planning jointly with agriculture and livestock. Given the cost and uncertainty of fencing, the most urgent aspects of such cooperation to develop are the relations between trees and livestock. In each planting proposal, what are the effects upon livestock? What will compensate for the area blocked off from grazing? Will the trees proposed contribute to the forage resource?

One can point out that the 4000 hectares of planting which the SRP proposes can have no appreciable effect upon the forage resource. True enough. But the SRP is, or should be pioneering and exploratory, looking to catch the farmers' imagination and interest in ways that no other projects, for all their local success, have done. The object is not simply to shift resources out of crops and livestock and into forestry. The object is to combine the three most advantageously. Proposals accepted for cost sharing should indicate progress toward that objective.

5.6 Question 35 of the Tree Products Study asked for suggestions as to how to increase farm revenue through tree products. The answers indicate that the respondents thought of charcoal as being the biggest potential source of revenue. More money changes hands over charcoal than over any other tree product. At present farmers are largely outside the business. The respondents therefore mentioned farm cooperatives, more direct marketing, faster growing species, and a more permissive forestry code as being needed to bring charcoal into the farm economy.

Forest policy now discourages the sale of fuelwood in any form from farm land in the belief that trees have more important uses on agricultural land than for fuel. Those trees with value for soil quality and stability are to remain in place according to that policy.

What will persuade farmers to grow fuelwood on their idle land now to increase their revenue and to relieve the pressure on the natural forests? Precedents do exist (Annex IV Reference 4) where guaranteed prices have brought about large-scale planting to meet a known demand for tree products, helped along in some cases by loans.

Farmers do not now plant trees for fuelwood because, among other reasons, the pricing policies for charcoal allow no margin for the value of standing trees. At present users of charcoal expect to pay for its manufacture, transport, taxes and marketing, but not for the cost of growing the wood or replacing it.

The answers to the questions posed can best be found through a research demonstration to find out the cost of growing wood and the returns necessary to make it attractive to those who have access to the components needed. The details are not easily envisaged at this point. However no other tree product has so much potential for getting trees planted and increasing farm revenues.

5.7 The Tree Products Study has suggested several additions to the scope of SRP activities. Among them are guaranteed markets for fuelwood, attention to natural re-growth of trees, cooperation with the Animal Husbandry Division of the Ministry of Rural Development in increasing forage resources, and broadening the offerings of tree species for planting so as to respond better to rural interests in tree products. They can fit in well with the objectives of the SRP provided the media, training and the matching grant program retain enough flexibility and research funds to respond as appropriate.

5.8 Proposals for further studies

1. The place of tree products in the farm enterprise. The object is to gather information on such subjects as,
 - a) the contribution of tree products to human and livestock nutrition : the species, forms, quantities and seasons.
 - b) the extent to which the tree products are gathered from wild or planted trees.
 - c) the quantities and kinds of tree products sold and at what price
 - d) the marketing system used, whether through local markets or intermediaries.

Forestry agents should be able to gather such information during their contacts with farmers. They should make periodic reports to be incorporated into a data base which will help to guide the Ministry in designing programs to motivate tree-planting by the rural population.

2. The trends in the marketing of tree products. The object is to gather information such as,
 - a) the seasonal trends as to what is sold in local markets
 - b) the trends in quantities and prices

- c) the origin of tree products, whether local or from outside the area
- d) the consumption, whether local or outside the area.

The section chiefs should be responsible for collecting information on a quarterly basis and sending reports to the Division of Forest Production. The purpose is to build a data base and to keep in focus, neither exaggerating nor overlooking the importance of tree products.

- 3. Germination and out-planting of tree species new or not widely used in planting projects. Tree species whose
 - a) silvicultural characteristics are not well known but whose on-farm use and presence in markets indicate that they are of economic interest, and whose
 - b) products are not now widely known but which botanical studies suggest do have useful products.

The purpose is to broaden the basis of tree planting and care to make better use of Senegal's rich and useful tree flora. At present no more than a dozen tree species are regularly used in planting programs whereas the country's total tree flora, indigenous and foreign, numbers nearly 400 species. Such studies can best be carried out at designated nurseries, perhaps at least one for each region, under the supervision of an assistant to the Head of Silviculture and Reforestation. He should receive training for the purpose at the National Seed Center in Burkina Fasso.

- 4. Nutritional and pharmaceutical research on the values of tree products to humans and livestock.

Programs urging fuller use of the native tree resources need proven scientific facts to substantiate their claims and broaden the basis of use. They thereby can give specific information about nutritional value, medicinal value, recipes, formulas, food preparation and so on.

ANNEX I. TERMS OF REFERENCE

ANNEX I

TERMS OF REFERENCE

The Consultant will be expected to verify and analyze the data collected in the tree products potential study. The analysis should highlight the following themes:

- benefits that the farmers now have and can expect to have in the future from tree products integrated into their farming systems,
- constraints to raising rural incomes with tree products,
- regional and country wide marketing of tree products,
- comparative importance of different tree products,
- products whose farm and marketing potential are not now known,
- problems and attitudes of rural people towards trees and their products as part of their agricultural system, and
- the level of understanding of the projects' objectives by the different services working with the rural population.

The Consultant will identify areas where information is lacking about tree products and will undertake his own investigation of these areas. He may propose further, indepth studies as he feels are needed.

The Consultant will keep a list of institutions visited and will note down their addresses.

The Consultant will keep a list of individuals interviewed, consulted, and visited which will include the date of the meeting, the title of the individual and a reliable means of contacting the individual.

The Consultant will be expected to produce a draft End of Tour Report before the completion of each TDY. The report is to include an executive summary, accomplishments, and recommendations. The annexes of the report will include a daily log and the above mentioned two lists. When applicable, proposals which might require change(s) in the project objectives should also be clearly stated in the report. Such proposals will serve as the basis to formalize the change(s) with the GOS and USAID. The Consultant will turn in the final version of the EOT report upon completion of the assignment.

The Consultant will be expected to give a seminar before the completion of each assignment. The seminar will highlight the activities of the TDY. MPN and USAID staff will be invited to attend the seminar. Other outsiders may be invited as deemed appropriate. The exact date for this seminar should be fixed at the onset of the TDY.

The Consultant's point of contact throughout his work will be the SECID Chief of Party. A project vehicle with driver will be placed at the disposition of the Consultant on an as-needed basis. It should be noted that all financial matters pertaining to this consultancy will be arranged by the SECID Administrative Office prior to arrival in Senegal.

ANNEX II. CHRONOLOGY OF TOUR

ANNEX II.

CHRONOLOGY OF TREE PRODUCTS STUDY

ANALYSIS TOUR

Thursday, February 16, 1989
Arrival Dakar 1:40 p.m.

February 17 - March 31, 1989
Duty Station at Dakar

Saturday, April 1, 1989
Depart Dakar 10:00 a.m.

ANNEX III. PARTIAL LIST OF PERSONS CONTACTED

ANNEX III.

PARTIAL LIST OF PERSONS CONTACTED

Valery Kelly
Director, Household Consumption Study
ISRA Veterinary Laboratory
Parc Forestier de Hann
Tel: 32.04.62

Abe Diop
Consultant, Groupement d'Intérêt Economique
Siège No. 364 Notaire Guediawaye
Dakar

Yves Prévost,
Ecologiste, Projet SEN/84/09 Création de Suivi
Ecologique OPE/UNSO BP Dakar
Tel: 21.32.44

ANNEX V. LISTS OF TREE SPECIES

Questions 1 and 2. Species used for human nutrition.

Scientifique	Number	Leaves	Pods	Bark	Fruit	Others
<i>Adansonia digitata</i>	82	65	1	3	76	1
<i>Zizyphus mauritiana</i>	56	23		1	53	
<i>Balanites aegyptica</i>	51	1	3	1	45	1
<i>Tamarindus indica</i>	51	9	2	1	44	1
<i>Combretum glutinosum</i>	44	26			8	1
<i>Combretum micranthum</i>	44	28			8	
<i>Parkia biglobosa</i>	41	1		1	36	
<i>Borassus aethiopum</i>	34	1		1	31	
<i>Parinari macrophylla</i>	31				30	
<i>Diospyros mespiliformis</i>	24				23	
<i>Cordyla pinnata</i>	22			1	19	
<i>Guiera senegalensis</i>	20	12			5	
<i>Sclerocarya birrea</i>	20			2	15	
<i>Detarium senegalense</i>	19				19	
<i>Elias guineensis</i>	17				16	10
<i>Landolphia heudelotii</i>	17		1		15	
<i>Detarium microcarpum</i>	16			1	14	
<i>Vitex doniana</i>	16	1		1	14	
<i>Khaya senegalensis</i>	14			5	2	
<i>Acacia senegal</i>	13				1	11
<i>Anarcadium occidentale</i>	12				12	1
<i>Annona senegalensis</i>	12	2			9	
<i>Boscia senegalensis</i>	12	1	1	1	7	1
<i>Acacia nilotica</i>	11	4	4		2	1
<i>Celtis integrifolia</i>	11			1	7	1
<i>Parinari excelsa</i>	11				10	
<i>Cola cordifolia</i>	9	1			9	
<i>Cassia tora</i>	8	2			5	
<i>Saba sengalensis</i>	8				8	
<i>Cassia sieberiana</i>	7	2			1	2
<i>Sesbania sesban</i>	7	3	2	1	4	
<i>Sterculia setigera</i>	7				2	4
<i>Aphania senegalensis</i>	6				5	
<i>Commiphora africana</i>	6	1			3	
<i>Ficus gnaphalocarpa</i>	6	2			6	
<i>Dalbergia melanoxylon</i>	5		1		4	
<i>Grewia bicolor</i>	4			2		1
<i>Piliostigma reticulatum</i>	4	3				1
<i>Cassia italica</i>	3	3				
<i>Dialium guineense</i>	3				3	
<i>Momordica balsamina</i>	3	3				
<i>Terminalia catappa</i>	3				3	
<i>Ximonia americana</i>	3				3	
<i>Azalia africana</i>	2				2	
<i>Azadirachta indica</i>	2	1				
<i>Cassuarina equisetifolia</i>	2	2				
<i>Eucalyptus camaldulensis</i>	2	1				
<i>Piliostigma thonningi</i>	2				1	1
<i>Terminalia avicennoides</i>	2				1	1
<i>Acacia albida</i>	1			1		

Questions 1 and 2. Species used for human nutrition.

Scientifique	Number	Leaves	Pods	Bark	Fruit	Others
Acacia pennata	1				1	
Anogeissus leiocarpus	1	1				
Annona squamosa	1				1	
Bauhinia rufescens	1				1	
Calotropis procera	1					
Carapa procera	1					1
Combretum nigricans	1	1				
Daniellia oliveri	1				1	
Hyphaene tebaica	1				1	
Prosopis africana	1	1			1	
Pterocarpus erinaceus	1				1	
Tinospora bakis	1					
Xylopia aethiopica	1					

7/2 sp

Questions 3 and 4. Species used for animal nutrition.

Scientific name	Number	Leaves	Pods	Bark	Fruits	Other
<i>Acacia albida</i>	63	36	7		49	1
<i>Adansonia digitata</i>	28	27			4	
<i>Acacia raddiana</i>	24	7	6		19	1
<i>Prosopis africana</i>	24	11			19	
<i>Pterocarpus erinaceus</i>	22	18			6	
<i>Acacia nilotica</i>	16	4	3		11	
<i>Combretum micranthum</i>	14	13				
<i>Guiera senegalensis</i>	14	14				
<i>Balanites aegyptica</i>	12	12	2		2	
<i>Acacia seyal</i>	11	8			5	
<i>Acacia senegal</i>	9	9				
<i>Anogeissus leiocarpus</i>	9	6			3	
<i>Zizyphus mauritiana</i>	7	7			1	
<i>Celtis integrifolia</i>	6	3			2	
<i>Cordyla pinnata</i>	6	3			2	
<i>Ficus gnaphalocarpa</i>	6	4			2	
<i>Sclerocarya birrea</i>	5	3			5	
<i>Tamarindus indica</i>	5	5			1	
<i>Bauhinia rufescens</i>	4	3			1	
<i>Combretum glutinosum</i>	4	4				
<i>Azelia africana</i>	3	3				
<i>Ceiba pentandra</i>	3	3				
<i>Ficus capensis</i>	3	3				
<i>Borassus aethiopicum</i>	2	1			1	
<i>Elias guineensis</i>	2	1			1	
<i>Eucalyptus camaldulensis</i>	2	2				
<i>Khaya senegalensis</i>	2	2				
<i>Piliostigma reticulatum</i>	2	2				
<i>Pterocarpus lucens</i>	2	2				
<i>Boscia senegalensis</i>	1	1				
<i>Carapa procera</i>	1	1				
<i>Cassia sieberiana</i>	1	1				
<i>Detarium senegalense</i>	1	1				
<i>Landolphia heudelotii</i>	1	1				
<i>Morinda geminata</i>	1	1				
<i>Parinari excelsa</i>	1	1				
<i>Parinari macrophylla</i>	1	1				
<i>Sesbania sesban</i>	1	1				
<i>Terminalia avicennoides</i>	1	1				
<i>Terminalia catappa</i>	1	1				

Questions 5 and 6. Species used in the fabrication of pharmaceuticals.

Scientific name	Number	Leaves	Pods	Bark	Fruits	Others
<i>Adansonia digitata</i>	63	57		7	53	2
<i>Combretum micranthum</i>	40	40			1	1
<i>Combretum glutinosum</i>	37	35			2	1
<i>Tamarindus indica</i>	29	15	2	2	24	1
<i>Balanites aegyptica</i>	28	17	2	6	17	2
<i>Zizyphus mauritiana</i>	24	22	1	7	13	2
<i>Guiera senegalensis</i>	23	22			2	2
<i>Khaya senegalensis</i>	11	1		10	1	
<i>Parkia biglobosa</i>	11				10	
<i>Cassia sieberiana</i>	10	4		1		6
<i>Sclerocarya birrea</i>	10	8	1	5	5	1
<i>Celtis integrifolia</i>	8	3	1	1	6	1
<i>Grewia bicolor</i>	7	1		7	1	1
<i>Acacia nilotica</i>	6	1	2	1	2	
<i>Borassus aethiopum</i>	6	5			5	
<i>Cordyla pinnata</i>	6	1			5	
<i>Acacia albida</i>	5	2		1	2	
<i>Acacia senegal</i>	5	1				4
<i>Anogeissus leiocarpus</i>	5	2		1		1
<i>Boscia senegalensis</i>	5	4			4	1
<i>Elias guineensis</i>	5				3	3
<i>Piliostigma reticulatum</i>	5	4		1	1	2
<i>Tinospora bakis</i>	5	2	1			4
<i>Prosopis africana</i>	4	2			1	
<i>Acacia sieberiana</i>	3	1			2	1
<i>Anarcadium occidentale</i>	3	1		1	1	1
<i>Eucalyptus camaldulensis</i>	3	3				
<i>Parinari macrophylla</i>	3	1		2		1
<i>Acacia raddiana</i>	2	1		1		
<i>Carapa procera</i>	2					2
<i>Cassia italica</i>	2	2				
<i>Ceiba pentandra</i>	2	2				1
<i>Commiphora africana</i>	2	2			1	
<i>Detarium senegalense</i>	2	1		2	1	
<i>Terminalia avicennoides</i>	2	1				2
<i>Azadirachta indica</i>	1			1		
<i>Calotropis procera</i>	1	1				
<i>Cassuarina equisetifolia</i>	1	1				
<i>Cola cordifolia</i>	1	1				
<i>Dalbergia melanoxylon</i>	1	1	1		1	
<i>Ficus capensis</i>	1	1				
<i>Momordica balsamina</i>	1	1				
<i>Piliostigma thonningii</i>	1					1
<i>Pterocarpus erinaceus</i>	1				1	
<i>Sterculia setigera</i>	1					1
<i>Vitex doniana</i>	1				1	
<i>Ximinia americana</i>	1					1

Questions 1-6. Species cited for each use, organized to show overlaps.

Scientific name	Used as food	Used as forage	Used as medicine
Acacia albida	1	1	1
Acacia senegal	1	1	1
Adansonia digitata	1	1	1
Anogeissus leiocarpus	1	1	1
Balanites aegyptica	1	1	1
Borassus aethiopum	1	1	1
Boscia senegalensis	1	1	1
Carapa procera	1	1	1
Cassia sieberiana	1	1	1
Celtis integrifolia	1	1	1
Combretum glutinosum	1	1	1
Combretum micranthum	1	1	1
Cordyla pinnata	1	1	1
Detarium senegalense	1	1	1
Elias guineensis	1	1	1
Eucalyptus camaldulensis	1	1	1
Guiera senegalensis	1	1	1
Khaya senegalensis	1	1	1
Parinari macrophylla	1	1	1
Piliostigma reticulatum	1	1	1
Prosopis africana	1	1	1
Pterocarpus erinaceus	1	1	1
Sclerocarya birrea	1	1	1
Tamarindus indica	1	1	1
Terminalia avicennoides	1	1	1
Zizyphus mauritiana	1	1	1
Acacia nilotica	1	1	0
Azalia africana	1	1	0
Bauhinia rufescens	1	1	0
Ficus gnaphalocarpa	1	1	0
Landolphia heudelotii	1	1	0
Parinari excelsa	1	1	0
Sesbania sesban	1	1	0
Terminalia catappa	1	1	0
Anarcadium occidentale	1	0	1
Azandirachta indica	1	0	1
Calotropis procera	1	0	1
Cassia italica	1	0	1
Cassuarina equisetifolia	1	0	1
Cola cordifolia	1	0	1
Commiphora africana	1	0	1
Dalbergia melanoxylon	1	0	1
Grewia bicolor	1	0	1
Parkia biglobosa	1	0	1
Piliostigma thonningi	1	0	1
Sterculia setigera	1	0	1
Tinospora bakis	1	0	1
Vitex doniana	1	0	1
Ximania americana	1	0	1
Acacia pennata	1	0	0
Annona senegalensis	1	0	0
Aphania senegalensis	1	0	0

Questions 1-6. Species cited for each use, organized to show overlaps.

Scientific name	Used as food	Used as forage	Used as medicine
Cassia tora	1	0	0
Combretum nigricans	1	0	0
Daniellia oliveri	1	0	0
Detarium microcarpum	1	0	0
Dialium guineense	1	0	0
Diospyros mespiliformis	1	0	0
Hyphaene tebaica	1	0	0
Saba sengalensis	1	0	0
Xylopia aethiopica	1	0	0
Acacia raddiana	0	1	1
Ceiba pentandra	0	1	1
Ficus capensis	0	1	1
Acacia seyal	0	1	0
Morinda geminata	0	1	0
Pterocarpus lucens	0	1	0
Acacia sieberiana	0	0	1
Momordica balsamina	0	0	1

Question 7. Other uses of trees.

Scientific name	Number	Wind break	Fire wood	Construction wood	Honey	Other
<i>Adansonia digitata</i>	50			3		58
<i>Balanites aegyptica</i>	22	8	11	1	3	3
<i>Acacia albida</i>	21	1	13	5		8
<i>Borassus aethiopicum</i>	21	1	3	13		
<i>Zizyphus mauritiana</i>	21	4	18	3		1
<i>Pterocarpus erinaceus</i>	17	2	4	3		15
<i>Cordyla pinnata</i>	13	2	7	5		8
<i>Elias guineensis</i>	11			3		3
<i>Acacia nilotica</i>	10	6	9	3		1
<i>Combretum micranthum</i>	10	2	8			
<i>Guiera senegalensis</i>	10		9	5		1
<i>Prosopis africana</i>	9	9	2	1		
<i>Acacia senegal</i>	8	6	8	1		
<i>Combretum glutinosum</i>	8	2	5	2		
<i>Celtis integrifolia</i>	7		6	7		
<i>Sclerocarya birrea</i>	7		7	5		1
<i>Tamarindus indica</i>	5	1	5			
<i>Grewia bicolor</i>	5			3		1
<i>Anarcadium occidentale</i>	4	4	2			
<i>Boscia senegalensis</i>	4		4			1
<i>Khaya senegalensis</i>	4		2	2		2
<i>Parinari macrophylla</i>	4		2	1		2
<i>Dalbergia melanoxylon</i>	3		3	2		1
<i>Ptilostigma reticulatum</i>	3		3	1		
<i>Acacia raddiana</i>	2		1	1		1
<i>Acacia seyal</i>	2		2			
<i>Anogeissus leiocarpus</i>	2		2			1
<i>Eucalyptus camaldulensis</i>	2		1	2		1
<i>Annona senegalensis</i>	1			1		
<i>Bombax costatum</i>	1			1		
<i>Cassuarina equisetifolia</i>	1			1		1
<i>Ceiba pentandra</i>	1					1
<i>Cola cordifolia</i>	1		1			
<i>Detarium senegalense</i>	1	1				
<i>Parkia biglobosa</i>	1		1			

Question 8. Summary of responses by species.

Scientific name	No. of responses to spontaneous regeneration	No. of responses to regeneration by plantation
Acacia albida	38	1
Acacia nilotica	8	
Acacia pennata	1	
Acacia raddiana	9	
Acacia senegal	9	1
Acacia seyal	5	
Acacia sieberiana	1	
Adansonia digitata	66	2
Afzelia africana	4	
Anarcadium occidentale	14	9
Annona senegalensis	8	1
Anogeissus leiocarpus	5	
Aphania senegalensis	3	
Azadirachta indica	1	
Balanites aegyptica	39	2
Borassus aethiopum	21	
Boscia senegalensis	5	1
Calotropis procera	2	
Carapa procera	3	
Cassia italica	1	
Cassia sieberiana	10	
Cassia tora	3	
Cassuarina equisetifolia	1	
Ceiba pentandra	2	
Celtis integrifolia	3	1
Cola cordifolia	6	
Combretum glutinosum	24	
Combretum micranthum	19	
Commiphora africana	5	
Cordyla pinnata	18	
Dalbergia melanoxylon	2	
Detarium microcarpum	12	
Detarium senegalense	9	
Dialium guineense	3	
Diospyros mespiliformis	17	
Elias guineensis	14	
Eucalyptus camaldulensis	1	2
Ficus capensis	3	
Ficus gnaphalocarpa	5	
Grewia bicolor	6	
Guiera senegalensis	26	
Khaya senegalensis	8	
Landolphia heudelotii	17	
Lophira lanceolata		
Momordica balsamina	1	
Morinda geminata	1	
Parinari excelsa	9	
Parinari macrophylla	19	
Parkia biglobosa	27	
Piliostigma reticulatum	5	
Prosopis africana	20	20

Question 8. Summary of responses by species.

Scientific name	No. of responses to spontaneous regeneration	No. of responses to regeneration by plantation
<i>Pterocarpus erinaceus</i>	10	
<i>Saba sengalensis</i>	7	
<i>Sclerocarya birrea</i>	13	1
<i>Sesbania sesban</i>	2	1
<i>Sterculia setigera</i>	5	
<i>Tamarindus indica</i>	37	1
<i>Terminalia avicennoides</i>	2	
<i>Terminalia catappa</i>	5	3
<i>Tinospora bakis</i>	3	
<i>Vitex doniana</i>	10	
<i>Ximonia americana</i>	2	
<i>Xylopia aethiopica</i>	1	
<i>Zizyphus mauritiana</i>	36	1

Question 12. Responses to the question concerning the cultural importance of trees.
Summarized by region.

Region	Scientific name	Cultural importance
Dakar	<i>Adansonia digitata</i>	Lieu de culte
Dakar	<i>Adansonia digitata</i>	Lieu de culte de Lébou "Khamb"
Dakar	<i>Adansonia digitata</i>	Lieu de culte et de fétichisme des Lébou
Dakar	<i>Adansonia digitata</i>	Lieu de cérémonie rituelle
Dakar	<i>Adansonia digitata</i>	Totem des Lébou
Dakar	<i>Azandirechta indica</i>	Arbre à palabre
Diourbel	<i>Acacia albida</i>	Nom de village - Dara Kad
Diourbel	<i>Acacia raddiana</i>	Arbre à palabre
Diourbel	<i>Adansonia digitata</i>	Arbre à palabre
Diourbel	<i>Adansonia digitata</i>	Bois Dioulo lieu de circoncision
Diourbel	<i>Adansonia digitata</i>	Bois Tekhé
Diourbel	<i>Adansonia digitata</i>	Bois siyar refuge de Cheikh Ahmadou Bamba
Diourbel	<i>Adansonia digitata</i>	Bois tekhé nom de quartier
Diourbel	<i>Adansonia digitata</i>	Lieu d'inhumation des griots serrerés
Diourbel	<i>Adansonia digitata</i>	Lieu de culte
Diourbel	<i>Celtis integrifolia</i>	Nom de village historique
Diourbel	<i>Detarium senegalense</i>	Lieu de culte
Diourbel	<i>Detarium senegalense</i>	Lieu privilégié pour tenir des conseils de guerre
Diourbel	<i>Tamarindus indica</i>	Arbre à palabre
Diourbel	<i>Zizyphus mauritiana</i>	Nom de village - Nden
Fatick	<i>Adansonia digitata</i>	Arbre à palabre
Fatick	<i>Adansonia digitata</i>	Lieu d'incantation (Mada) - Enterrement de griot
Fatick	<i>Adansonia digitata</i>	Lieu d'incantation et de libation
Fatick	<i>Cola cordifolia</i>	Arbre à palabre
Fatick	<i>Piliostigma reticulatum</i>	Nom d'un village
Fatick	<i>Tamarindus indica</i>	Lieu de rassemblement des circoncis
Kaolack	<i>Cordyla pinnata</i>	Arbre à palabre
Kaolack	<i>Cordyla pinnata</i>	Nom de village
Kaolack	<i>Ficus capensis</i>	Arbre à palabre
Kaolack	<i>Guiera senegalensis</i>	Nom de village
Kaolack	<i>Guiera senegalensis</i>	Nom de village
Kolda	<i>Ceiba pentandra</i>	Arbre à palabre, lieu des grandes décisions
Kolda	<i>Ceiba pentandra</i>	Bantamba (le grand Banta, le majestueux) lieu des
Kolda	<i>Ceiba pentandra</i>	Bantamba siège des grandes décisions
Kolda	<i>Khaya senegalensis</i>	Arbre fétiche
Kolda	<i>Khaya senegalensis</i>	Arbre fétiche chez les mandingues
Louga	<i>Celtis integrifolia</i>	Lieu des Lamanes
Saint-Louis	<i>Adansonia digitata</i>	Séris protecteur des circoncis
Tambacounda	<i>Adansonia digitata</i>	Arbre à palabre - Cérémonie rituelle
Tambacounda	<i>Adansonia digitata</i>	Arbre à palabre - lieu de rite et culte
Thiès	<i>Acacia albida</i>	A Lam-Lam Baobab jumelé lieu de rencontre des
Thiès	<i>Celtis integrifolia</i>	Nom de village
Thiès	<i>Celtis integrifolia</i>	Nom de village où se dresse un Mbul c'est fait
Thiès	<i>Cola cordifolia</i>	A Tivaouane Tabba Baye Niass arbre à palabre
Thiès	<i>Cola cordifolia</i>	Arbre à palabre portant le nom du Chef de Canton
Thiès	<i>Grewia bicolor</i>	Nom de village
Thiès	<i>Guiera senegalensis</i>	Nom de village "Souguer"
Thiès	<i>Piliostigma reticulatum</i>	Nom de village
Ziguinchor	<i>Bauhinia thonningii</i>	Habit de Kankouran
Ziguinchor	<i>Bauhinia thonningii</i>	Préparation du Kankouran

Question 12. Responses to the question concerning the cultural importance of trees,
Summarized by region.

Region	Scientific name	Cultural importance
Ziguinchor	Ceiba pentandra	Arbre à palabre, arbre de culte
Ziguinchor	Ceiba pentandra	Arbre à palabre, arbre à génie
Ziguinchor	Ceiba pentandra	Arbre à palabre, lieu de culte
Ziguinchor	Ceiba pentandra	Lieu de culte

Question 15. Response to the question concerning tree commercialized by rural farmers, number of times each species was cited.

Scientific name	Number
Adansonia digitata	60
Balanites aegyptica	44
Tamarindus indica	43
Zizyphus mauritiana	42
Parkia biglobosa	31
Borassus aethiopum	23
Parinari macrophylla	22
Detarium senegalense	21
Combretum micranthum	17
Diospyros mespiliformis	16
Elias guineensis	15
Cordyla pinnata	12
Combretum glutinosum	11
Acacia senegal	10
Landolphia heudelotii	10
Vitex doniana	9
Saba sengalensis	8
Commiphora africana	7
Detarium microcarpum	7
Acacia nilotica	6
Parinari excelsa	6
Anarcadium occidentale	5
Annona senegalensis	5
Aphania senegalensis	5
Boscia senegalensis	5
Ficus gnaphalocarpa	5
Sclerocarya birrea	5
Cola cordifolia	4
Acacia alba	3
Guiera senegalensis	3
Sterculia setigera	3
Terminalia catappa	3
Dialium guineense	2
Acacia raddiana	1
Acacia seyal	1
Azandirechta indica	1
Dalbergia melanoxylon	1
Eucalyptus camaldulensis	1
Grewia bicolor	1
Hyphaene tbaïca	1
Khaya senegalensis	1
Momordica balsamina	1
Pterocarpus erinaceus	1
Ximonia americana	1
Xylopiya aethiopica	1

Results from market survey, parts used and degree of commercialisation (T= high, M= medium, and P= small).

Town	Scientific name	Leaves	Fruits	Bark	Roots	Sap	Degree of Commerce
Pikine No 1	<i>Adansonia digitata</i>	1	1				T
Pikine No 1	<i>Anarcadium occidentale</i>		1				M
Pikine No 1	<i>Aphania senegalensis</i>		1				T
Pikine No 1	<i>Balanites aegyptica</i>		1				T
Pikine No 1	<i>Borassus aethiopus</i>		1				T
Pikine No 1	<i>Combretum micranthum</i>	1					T
Pikine No 1	<i>Cordyla pinnata</i>		1				M
Pikine No 1	<i>Detarium microcarpum</i>		1				M
Pikine No 1	<i>Detarium senegalense</i>		1				T
Pikine No 1	<i>Dialium guineense</i>		1				T
Pikine No 1	<i>Diospyros mespiliformis</i>		1				M
Pikine No 1	<i>Elias guineensis</i>		1			1	T
Pikine No 1	<i>Ficus gnaphalocarpa</i>		1				M
Pikine No 1	<i>Landolphia heudelotii</i>		1				T
Pikine No 1	<i>Parinari macrophylla</i>		1				T
Pikine No 1	<i>Parkia biglobosa</i>		1				T
Pikine No 1	<i>Saba sengalensis</i>		1				T
Pikine No 1	<i>Tamarindus indica</i>		1				T
Pikine No 1	<i>Vitex doniana</i>		1				T
Pikine No 1	<i>Zizyphus mauritiana</i>		1				T
Pikine No 2	<i>Acacia albida</i>		1				M
Pikine No 2	<i>Acacia nilotica</i>						
Pikine No 2	<i>Acacia nilotica, adansoni</i>		1				M
Pikine No 2	<i>Acacia senegal</i>					1	M
Pikine No 2	<i>Boscia senegalensis</i>					1	P
Pikine No 2	<i>Cassia italica</i>	1					M
Pikine No 2	<i>Cassia sieberiana</i>					1	M
Pikine No 2	<i>Ceiba pentandra</i>						
Pikine No 2	<i>Cola cordifolia</i>		1				M
Pikine No 2	<i>Combretum glutinosum</i>	1					M
Pikine No 2	<i>Grewia bicolor</i>			1			M
Pikine No 2	<i>Khaya senegalensis</i>			1			M
Pikine No 2	<i>Momordica balsamina</i>						
Pikine No 2	<i>Piliostigma reticulatum</i>	1					M
Pikine No 2	<i>Salvador persica</i>						P
Pikine No 2	<i>Sesbania sesban</i>					1	P
Pikine No 2	<i>Sterculia setigera</i>						
Diourbel	<i>Acacia nilotica, adansoni</i>		1				T
Diourbel	<i>Acacia raddiana</i>		1				M
Diourbel	<i>Acacia senegal</i>						T
Diourbel	<i>Adansonia digitata</i>	1	1	1			T
Diourbel	<i>Aphania senegalensis</i>		1			1	T
Diourbel	<i>Balanites aegyptica</i>		1				T
Diourbel	<i>Cassia italica</i>	1					P
Diourbel	<i>Combretum glutinosum</i>	1					M
Diourbel	<i>Combretum micranthum</i>	1					T
Diourbel	<i>Cordyla pinnata</i>		1				M
Diourbel	<i>Detarium senegalense</i>		1				T
Diourbel	<i>Diospyros mespiliformis</i>		1				M
Diourbel	<i>Parinari macrophylla</i>		1				M
Diourbel	<i>Parkia biglobosa</i>		1				T

Results from market survey, parts used and degree of commercialisation (T= high, M= medium, and P= small).

Town	Scientific name	Leaves	Fruits	Bark	Roots	Sap	Degree of Commerce
Diourbel	<i>Sesbania sesban</i>	1					P
Diourbel	<i>Vitex doniana</i>		1				M
Diourbel	<i>Zizyphus mauritiana</i>	1	1				T
Fatick	<i>Acacia albida</i>		1				M
Fatick	<i>Acacia raddiana</i>		1				M
Fatick	<i>Acacia senegal</i>					1	T
Fatick	<i>Adansonia digitata</i>	1	1				M
Fatick	<i>Balanites aegyptica</i>		1				M
Fatick	<i>Cola cordifolia</i>		1				M
Fatick	<i>Combretum glutinosum</i>	1					M
Fatick	<i>Combretum micranthum</i>	1					T
Fatick	<i>Commiphora africana</i>		1				T
Fatick	<i>Cordyla pinnata</i>		1				M
Fatick	<i>Diospyros mespiliformis</i>		1				M
Fatick	<i>Ficus capensis</i>		1				M
Fatick	<i>Guiera senegalensis</i>	1					M
Fatick	<i>Parinari excelsa</i>		1				M
Fatick	<i>Parinari macrophylla</i>		1				M
Fatick	<i>Parkia biglobosa</i>		1				
Fatick	<i>Sterculia setigera</i>					1	T
Fatick	<i>Tamarindus indica</i>		1				T
Fatick	<i>Vitex doniana</i>						
Fatick	<i>Zizyphus mauritiana</i>	1	1				T
Kaolack	<i>Acacia seyal</i>		1				T
Kaolack	<i>Adansonia digitata</i>		1				T
Kaolack	<i>Anogeissus leiocarpus</i>		1				M
Kaolack	<i>Borassus aethiopum</i>		1				M
Kaolack	<i>Cassia sieberiana</i>				1		M
Kaolack	<i>Cola cordifolia</i>		1				M
Kaolack	<i>Cordyla pinnata</i>		1				T
Kaolack	<i>Detarium microcarpum</i>		1				M
Kaolack	<i>Diospyros mespiliformis</i>		1				T
Kaolack	<i>Ficus capensis</i>	1					M
Kaolack	<i>Ficus gnaphalocarpa</i>		1				T
Kaolack	<i>Guiera senegalensis</i>	1					M
Kaolack	<i>Parinari macrophylla</i>		1				T
Kaolack	<i>Piliostigma reticulatum</i>				1		M
Kaolack	<i>Sclerocarya birrea</i>		1				M
Kaolack	<i>Sterculia setigera</i>					1	T
Kaolack	<i>Tamarindus indica</i>		1				T
Kaolack	<i>Ximania americana</i>		1				T
Kolda	<i>Acacia albida</i>		1				M
Kolda	<i>Acacia senegal</i>					1	
Kolda	<i>Acacia seyal</i>	1					M
Kolda	<i>Adansonia digitata</i>	1	1				M
Kolda	<i>Borassus aethiopum</i>		1				M
Kolda	<i>Calotropis procera</i>	1					T
Kolda	<i>Ceiba pentandra</i>	1					T
Kolda	<i>Cola cordifolia</i>		1				T
Kolda	<i>Combretum glutinosum</i>	1					M
Kolda	<i>Cordyla pinnata</i>		1				M
Kolda	<i>Detarium microcarpum</i>		1				M

Results from market survey, parts used and degree of commercialisation (T= high, M= medium, and P= small).

Town	Scientific name	Leaves	Fruits	Bark	Roots	Sap	Degree of Commerce
Kolda	<i>Detarium senegalense</i>		1				M
Kolda	<i>Diospyros mespiliformis</i>		1				T
Kolda	<i>Ficus capensis</i>	1					
Kolda	<i>Khaya senegalensis</i>			1			M
Kolda	<i>Landolphia heudelotii</i>		1				
Kolda	<i>Momordica balsamina</i>	1					M
Kolda	<i>Parkia biglobosa</i>		1				T
Kolda	<i>Saba senegalensis</i>		1				T
Kolda	<i>Tamarindus indica</i>		1				T
Sedhiou	<i>Acacia albida</i>		1				P
Sedhiou	<i>Acacia senegal</i>		1				M
Sedhiou	<i>Acacia seyal</i>		1				P
Sedhiou	<i>Adansonia digitata</i>	1	1				
Sedhiou	<i>Ceiba pentandra</i>	1					P
Sedhiou	<i>Cola cordifolia</i>		1				T
Sedhiou	<i>Combretum glutinosum</i>	1					
Sedhiou	<i>Combretum glutinosum</i>	1					M
Sedhiou	<i>Combretum micranthum</i>	1					P
Sedhiou	<i>Cordyla pinnata</i>		1				T
Sedhiou	<i>Detarium microcarpum</i>		1				M
Sedhiou	<i>Detarium senegalense</i>		1				M
Sedhiou	<i>Ficus capensis</i>	1					P
Sedhiou	<i>Khaya senegalensis</i>			1			P
Sedhiou	<i>Landolphia heudelotii</i>		1				M
Sedhiou	<i>Momordica balsamina</i>	1					P
Sedhiou	<i>Parkia biglobosa</i>		1				
Sedhiou	<i>Saba senegalensis</i>		1				M
Sedhiou	<i>Tamarindus indica</i>		1				M
Sedhiou	<i>Vitex dohiana</i>		1				M
Louga	<i>Acacia albida</i>		1				T
Louga	<i>Acacia raddiana</i>		1				T
Louga	<i>Adansonia digitata</i>	1	1	1			T
Louga	<i>Annona senegalensis</i>		1				T
Louga	<i>Balanites aegyptica</i>		1				T
Louga	<i>Combretum glutinosum</i>	1					M
Louga	<i>Combretum micranthum</i>	1					T
Louga	<i>Cordyla pinnata</i>						
Louga	<i>Guiera senegalensis</i>	1					P
Louga	<i>Parinari macrophylla</i>	1	1				T
Louga	<i>Parkia biglobosa</i>						
Louga	<i>Sclerocarya birrea</i>		1				M
Louga	<i>Tamarindus indica</i>		1				T
Louga	<i>Zizyphus mauritiana</i>	1	1				M
Saint-louis	<i>Acacia nilotica</i>						T
Saint-louis	<i>Acacia nilotica, adansoni</i>		1				M
Saint-louis	<i>Acacia senegal</i>					1	T
Saint-louis	<i>Adansonia digitata</i>	1	1				T
Saint-louis	<i>Balanites aegyptica</i>		1				T
Saint-louis	<i>Borassus aethiopicum</i>		1				T
Saint-louis	<i>Boscia senegalensis</i>					1	M
Saint-louis	<i>Celtis integrifolia</i>	1					M
Saint-louis	<i>Dalbergia melanoxylon</i>					1	T

Results from market survey, parts used and degree of commercialisation (T= high, M= medium, and P= small).

Town	Scientific name	Leaves	Fruits	Bark	Roots	Sap	Degree of Commerce
Saint-louis	<i>Guiera senegalensis</i>		1				
Saint-louis	<i>Sclerocarya birrea</i>		1				M
Saint-louis	<i>Zizyphus mauritiana</i>	1	1				T
Tambacounda	<i>Adansonia digitata</i>	1	1				M
Tambacounda	<i>Balanites aegyptica</i>		1				T
Tambacounda	<i>Borassus aethiops</i>		1				M
Tambacounda	<i>Combretum glutinosum</i>						
Tambacounda	<i>Combretum micranthum</i>	1					P
Tambacounda	<i>Cordyla pinnata</i>		1				M
Tambacounda	<i>Detarium microcarpum</i>		1				M
Tambacounda	<i>Tamarindus indica</i>		1				T
Tambacounda	<i>Vitex doniana</i>						
Tambacounda	<i>Zizyphus mauritiana</i>		1				M
Thiés	<i>Acacia albida</i>		1				M
Thiés	<i>Acacia raddiana</i>		1				M
Thiés	<i>Adansonia digitata</i>	1	1				T
Thiés	<i>Anarcadium occidentale</i>		1				T
Thiés	<i>Annona senegalensis</i>						
Thiés	<i>Balanites aegyptica</i>		1				M
Thiés	<i>Borassus aethiops</i>		1				T
Thiés	<i>Combretum glutinosum</i>	1					M
Thiés	<i>Combretum micranthum</i>						T
Thiés	<i>Detarium senegalense</i>		1				T
Thiés	<i>Grewia bicolor</i>			1			P
Thiés	<i>Guiera senegalensis</i>	1					P
Thiés	<i>Momordica balsamina</i>	1					M
Thiés	<i>Parinari macrophylla</i>		1				T
Thiés	<i>Parkia biglobosa</i>		1				T
Thiés	<i>Piliostigma reticulatum</i>				1		M
Thiés	<i>Saba senegalensis</i>		1				T
Thiés	<i>Tamarindus indica</i>		1				T
Thiés	<i>Terminalia catappa</i>		1				T
Thiés	<i>Zizyphus mauritiana</i>						T
Ziguinchor	<i>Acacia albida</i>		1				M
Ziguinchor	<i>Adansonia digitata</i>	1	1	1			T
Ziguinchor	<i>Anarcadium occidentale</i>		1				T
Ziguinchor	<i>Borassus aethiops</i>		1				T
Ziguinchor	<i>Calotropis procera</i>	1					P
Ziguinchor	<i>Cassia sieberiana</i>		1				M
Ziguinchor	<i>Combretum glutinosum</i>						
Ziguinchor	<i>Combretum micranthum</i>						M
Ziguinchor	<i>Detarium senegalense</i>		1				T
Ziguinchor	<i>Elias guineensis</i>		1				T
Ziguinchor	<i>Khaya senegalensis</i>			1			P
Ziguinchor	<i>Landolphia heudelotii</i>		1				M
Ziguinchor	<i>Parinari excelsa</i>		1				T
Ziguinchor	<i>Parinari macrophylla</i>		1				T
Ziguinchor	<i>Parkia biglobosa</i>						
Ziguinchor	<i>Tamarindus indica</i>		1				M
Ziguinchor	<i>Terminalia avicennoides</i>				1		M
Ziguinchor	<i>Ximania americana</i>		1				T
Ziguinchor	<i>Xylopia aethiopica</i>		1				T

Results from market survey, parts used and degree of commercialisation (T= high, M= medium, and P= small).

Town	Scientific name	Leaves	Fruits	Bark	Roots	Sap	Degree of Commerce
Ziguinchor	Zizyphus mauritiana	1	1				T

Results from market survey, reported by species.

Scientific name	Leaves	Fruits	Bark	Roots	Sap	Comm.	Town
Acacia albida		1				M	Pikine No 2
Acacia albida		1				M	Fatick
Acacia albida		1				M	Kolda
Acacia albida		1				P	Sedhiou
Acacia albida		1				T	Louga
Acacia albida		1				M	Thiès
Acacia albida		1				M	Ziguinchor
Acacia nilotica							Pikine No 2
Acacia nilotica						T	Saint-louis
Acacia nilotica, adansoni		1				M	Pikine No 2
Acacia nilotica, adansoni		1				T	Diourbel
Acacia nilotica, adansoni		1				M	Saint-louis
Acacia raddiana		1				M	Diourbel
Acacia raddiana		1				M	Fatick
Acacia raddiana		1				T	Louga
Acacia raddiana		1				M	Thiès
Acacia senegal					1	M	Pikine No 2
Acacia senegal						T	Diourbel
Acacia senegal					1	T	Fatick
Acacia senegal					1		Kolda
Acacia senegal		1				M	Sedhiou
Acacia senegal					1	T	Saint-louis
Acacia seyal		1				T	Kaolack
Acacia seyal	1					M	Kolda
Acacia seyal		1				P	Sedhiou
Adansonia digitata	1	1				T	Pikine No 1
Adansonia digitata	1	1	1			T	Diourbel
Adansonia digitata	1	1				M	Fatick
Adansonia digitata		1				T	Kaolack
Adansonia digitata	1	1				M	Kolda
Adansonia digitata	1	1					Sedhiou
Adansonia digitata	1	1	1			T	Louga
Adansonia digitata	1	1				T	Saint-louis
Adansonia digitata	1	1				M	Tambacounda
Adansonia digitata	1	1				T	Thiès
Adansonia digitata	1	1	1			T	Ziguinchor
Anarcadium occidentale		1				M	Pikine No 1
Anarcadium occidentale		1				T	Thiès
Anarcadium occidentale		1				T	Ziguinchor
Annona senegalensis		1				T	Louga
Annona senegalensis							Thiès
Anogeissus leicocarpus		1				M	Kaolack
Aphania senegalensis		1				T	Pikine No 1
Aphania senegalensis		1			1	T	Diourbel
Balanites aegyptica		1				T	Pikine No 1
Balanites aegyptica		1				T	Diourbel
Balanites aegyptica		1				M	Fatick
Balanites aegyptica		1				T	Louga
Balanites aegyptica		1				T	Saint-louis
Balanites aegyptica		1				T	Tambacounda
Balanites aegyptica		1				M	Thiès

Results from market survey, reported by species.

Scientific name	Leaves	Fruits	Bark	Roots	Sap	Comm.	Town
<i>Borassus aethiopum</i>		1				T	Pikine No 1
<i>Borassus aethiopum</i>		1				M	Kaolack
<i>Borassus aethiopum</i>		1				M	Kolda
<i>Borassus aethiopum</i>		1				T	Saint-louis
<i>Borassus aethiopum</i>		1				M	Tambacounda
<i>Borassus aethiopum</i>		1				T	Thiès
<i>Borassus aethiopum</i>		1				T	Ziguinchor
<i>Boscia senegalensis</i>				1		P	Pikine No 2
<i>Boscia senegalensis</i>				1		M	Saint-louis
<i>Calotropis procera</i>	1					T	Kolda
<i>Calotropis procera</i>	1					P	Ziguinchor
<i>Cassia italica</i>	1					M	Pikine No 2
<i>Cassia italica</i>	1					P	Dicourbel
<i>Cassia sieberiana</i>				1		M	Pikine No 2
<i>Cassia sieberiana</i>				1		M	Kaolack
<i>Cassia sieberiana</i>		1				M	Ziguinchor
<i>Ceiba pentandra</i>							Pikine No 2
<i>Ceiba pentandra</i>	1					T	Kolda
<i>Ceiba pentandra</i>	1					P	Sedhiou
<i>Celtis integrifolia</i>	1					M	Saint-louis
<i>Cola cordifolia</i>		1				M	Pikine No 2
<i>Cola cordifolia</i>		1				M	Fatick
<i>Cola cordifolia</i>		1				M	Kaolack
<i>Cola cordifolia</i>		1				T	Kolda
<i>Cola cordifolia</i>		1				T	Sedhiou
<i>Combretum glutinosum</i>	1					M	Pikine No 2
<i>Combretum glutinosum</i>	1					M	Dicourbel
<i>Combretum glutinosum</i>	1					M	Fatick
<i>Combretum glutinosum</i>	1					M	Kolda
<i>Combretum glutinosum</i>	1						Sedhiou
<i>Combretum glutinosum</i>	1					M	Sedhiou
<i>Combretum glutinosum</i>	1					M	Louga
<i>Combretum glutinosum</i>							Tambacounda
<i>Combretum glutinosum</i>	1					M	Thiès
<i>Combretum glutinosum</i>							Ziguinchor
<i>Combretum micranthum</i>	1					T	Pikine No 1
<i>Combretum micranthum</i>	1					T	Dicourbel
<i>Combretum micranthum</i>	1					T	Fatick
<i>Combretum micranthum</i>	1					P	Sedhiou
<i>Combretum micranthum</i>	1					T	Louga
<i>Combretum micranthum</i>	1					P	Tambacounda
<i>Combretum micranthum</i>						T	Thiès
<i>Combretum micranthum</i>						M	Ziguinchor
<i>Commiphora africana</i>		1				T	Fatick
<i>Cordyla pinnata</i>		1				M	Pikine No 1
<i>Cordyla pinnata</i>		1				M	Dicourbel
<i>Cordyla pinnata</i>		1				M	Fatick
<i>Cordyla pinnata</i>		1				T	Kaolack
<i>Cordyla pinnata</i>		1				M	Kolda
<i>Cordyla pinnata</i>		1				T	Sedhiou
<i>Cordyla pinnata</i>							Louga
<i>Cordyla pinnata</i>		1				M	Tambacounda

Results from market survey, reported by species.

Scientific name	Leaves	Fruits	Bark	Roots	Sap	Comm.	Town
<i>Dalbergia melanoxylon</i>				1		T	Saint-louis
<i>Detarium microcarpum</i>		1				K	Pikine No 1
<i>Detarium microcarpum</i>		1				K	Kaolack
<i>Detarium microcarpum</i>		1				K	Kolda
<i>Detarium microcarpum</i>		1				K	Sedhiou
<i>Detarium microcarpum</i>		1				K	Tambacounda
<i>Detarium senegalense</i>		1				T	Pikine No 1
<i>Detarium senegalense</i>		1				T	Diourbel
<i>Detarium senegalense</i>		1				K	Kolda
<i>Detarium senegalense</i>		1				K	Sedhiou
<i>Detarium senegalense</i>		1				T	Thiès
<i>Detarium senegalense</i>		1				T	Ziguinchor
<i>Dialium guineense</i>		1				T	Pikine No 1
<i>Diospyros mespiliformis</i>		1				K	Pikine No 1
<i>Diospyros mespiliformis</i>		1				K	Diourbel
<i>Diospyros mespiliformis</i>		1				K	Fatick
<i>Diospyros mespiliformis</i>		1				T	Kaolack
<i>Diospyros mespiliformis</i>		1				T	Kolda
<i>Elias guineensis</i>		1			1	T	Pikine No 1
<i>Elias guineensis</i>		1				T	Ziguinchor
<i>Ficus capensis</i>		1				K	Fatick
<i>Ficus capensis</i>	1					K	Kaolack
<i>Ficus capensis</i>	1						Kolda
<i>Ficus capensis</i>	1					P	Sedhiou
<i>Ficus gnaphalocarpa</i>		1				K	Pikine No 1
<i>Ficus gnaphalocarpa</i>		1				T	Kaolack
<i>Grewia bicolor</i>			1			K	Pikine No 2
<i>Grewia bicolor</i>			1			P	Thiès
<i>Guiera senegalensis</i>	1					K	Fatick
<i>Guiera senegalensis</i>	1					K	Kaolack
<i>Guiera senegalensis</i>	1					P	Louga
<i>Guiera senegalensis</i>		1					Saint-louis
<i>Guiera senegalensis</i>	1					P	Thiès
<i>Khaya senegalensis</i>			1			K	Pikine No 2
<i>Khaya senegalensis</i>			1			K	Kolda
<i>Khaya senegalensis</i>			1			P	Sedhiou
<i>Khaya senegalensis</i>			1			P	Ziguinchor
<i>Landolphia heudelotii</i>		1				T	Pikine No 1
<i>Landolphia heudelotii</i>		1					Kolda
<i>Landolphia heudelotii</i>		1				K	Sedhiou
<i>Landolphia heudelotii</i>		1				K	Ziguinchor
<i>Momordica balsamina</i>							Pikine No 2
<i>Momordica balsamina</i>	1					K	Kolda
<i>Momordica balsamina</i>	1					P	Sedhiou
<i>Momordica balsamina</i>	1					K	Thiès
<i>Parinari excelsa</i>		1				K	Fatick
<i>Parinari excelsa</i>		1				T	Ziguinchor
<i>Parinari macrophylla</i>		1				T	Pikine No 1
<i>Parinari macrophylla</i>		1				K	Diourbel
<i>Parinari macrophylla</i>		1				K	Fatick
<i>Parinari macrophylla</i>		1				T	Kaolack
<i>Parinari macrophylla</i>	1	1				T	Louga

Results from market survey, reported by species.

Scientific name	Leaves	Fruits	Bark	Roots	Sap	Comm.	Town
<i>Parinari macrophylla</i>		1				T	Thiés
<i>Parinari macrophylla</i>		1				T	Ziguinchor
<i>Parkia biglobosa</i>		1				T	Pikine No 1
<i>Parkia biglobosa</i>		1				T	Diourbel
<i>Parkia biglobosa</i>		1					Fatick
<i>Parkia biglobosa</i>		1				T	Kolda
<i>Parkia biglobosa</i>		1					Sedhiou
<i>Parkia biglobosa</i>							Louga
<i>Parkia biglobosa</i>		1				T	Thiés
<i>Parkia biglobosa</i>							Ziguinchor
<i>Piliostigma reticulatum</i>	1					M	Pikine No 2
<i>Piliostigma reticulatum</i>				1		M	Kaolack
<i>Piliostigma reticulatum</i>				1		M	Thiés
<i>Saba senegalensis</i>		1				T	Pikine No 1
<i>Saba senegalensis</i>		1				T	Kolda
<i>Saba senegalensis</i>		1				M	Sedhiou
<i>Saba senegalensis</i>		1				T	Thiés
<i>Salvador persica</i>						P	Pikine No 2
<i>Sclerocarya birrea</i>		1				M	Kaolack
<i>Sclerocarya birrea</i>		1				M	Louga
<i>Sclerocarya birrea</i>		1				M	Saint-louis
<i>Sesbania sesban</i>				1		P	Pikine No 2
<i>Sesbania sesban</i>	1					P	Diourbel
<i>Sterculia setigera</i>							Pikine No 2
<i>Sterculia setigera</i>					1	T	Fatick
<i>Sterculia setigera</i>					1	T	Kaolack
<i>Tamarindus indica</i>		1				T	Pikine No 1
<i>Tamarindus indica</i>		1				T	Fatick
<i>Tamarindus indica</i>		1				T	Kaolack
<i>Tamarindus indica</i>		1				T	Kolda
<i>Tamarindus indica</i>		1				M	Sedhiou
<i>Tamarindus indica</i>		1				T	Louga
<i>Tamarindus indica</i>		1				T	Tambacounda
<i>Tamarindus indica</i>		1				T	Thiés
<i>Tamarindus indica</i>		1				M	Ziguinchor
<i>Terminalia avicennoides</i>				1		M	Ziguinchor
<i>Terminalia catappa</i>		1				T	Thiés
<i>Vitex doniana</i>		1				T	Pikine No 1
<i>Vitex doniana</i>		1				M	Diourbel
<i>Vitex doniana</i>							Fatick
<i>Vitex doniana</i>		1				M	Sedhiou
<i>Vitex doniana</i>							Tambacounda
<i>Ximania americana</i>		1				T	Kaolack
<i>Ximania americana</i>		1				T	Ziguinchor
<i>Xylopiya aethiopica</i>		1				T	Ziguinchor
<i>Zizyphus mauritiana</i>		1				T	Pikine No 1
<i>Zizyphus mauritiana</i>	1	1				T	Diourbel
<i>Zizyphus mauritiana</i>	1	1				T	Fatick
<i>Zizyphus mauritiana</i>	1	1				M	Louga
<i>Zizyphus mauritiana</i>	1	1				T	Saint-louis
<i>Zizyphus mauritiana</i>		1				M	Tambacounda
<i>Zizyphus mauritiana</i>						T	Thiés

Results from market survey, reported by species.

Scientific name	Leaves	Fruits	Bark	Roots	Sap	Comm.	Town
Zizyphus mauritiana	1	1				T	Ziguinchor

ANNEX IV. BIBLIOGRAPHY

BIBLIOGRAPHICAL REFERENCES

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**ANNEX VI. IMPLICATIONS OF PROPOSED FORESTRY
CODE AND PRICE CONTROLS**

IMPLICATIONS FOR REFORESTATION OF PROPOSED FORESTRY CODE AND PRICE CONTROLS

The strategy of this project intends to promote the use and sale of tree products as a means toward widespread reforestation. Provisions of the forestry code and pricing policies appear to conflict with that strategy. Among them are the following.

- Article 25 distinguishes between tree products entering commercial channels through permits and taxes, and those gathered by local people for their own use without payment. The latter products may not be part of any commercial transaction nor move out of the place of origin without special permit. By not allowing the exchange of surplus, the provision restricts the free exchange of goods.

- A paragraph of Article 89 forbids the exploitation of tree products on agricultural land of the trees having value for soil quality and stability. The provision is a disincentive to planting trees on agricultural land with the intention of selling their products, and therefore to agroforestry.

- Section 2 deals with penalties to be imposed for exploiting trees without permit. Fines of up to 500.000 F.CFA and jail sentences of up to five years create risk and uncertainty, both disincentives to the project's purpose of widespread participation.

- The Government of Senegal controls the market price of firewood and charcoal as a means to keep down the cost of living. The controls also act as a disincentive to production of wood fuel. Official prices consider the cost of labor, taxes, permits and transport but do not allow a margin for standing trees. In effect they perpetuate the status of wood as an economically free good. Therefore the incentive is absent to plant and grow trees with the intention of selling their wood for fuel.

ANNEX VII. REPORT OF FIELD MISSION BY ABE DIOP

Le Consultant

Groupement d'Intérêt Économique

Régi par la Loi n° 84-37 du 11-5-1984

Siège n° 364 Notaire Guédiawaye

ENQUETE SUR LES PRODUITS DES ARBRES
FAISANT L'OBJET DE COURANT COMMERCIAL

RAPPORT DE MISSION
D'ENQUETE DIRIGEE PAR

ABE DIO P

DAKAR , JANVIER 19 89

BEST AVAILABLE COPY

I. Objectifs

L'enquête que nous venons de mener sur toute l'étendue du territoire national, consiste à rassembler quelques données objectives sur l'essentiel des arbres intervenant ou susceptibles d'intervenir dans le mode de vie des populations par :

- leur productivité
- leur rôle thérapeutique
- leur charge culturelle.

Le présent travail élabore aussi les multiples facteurs qui incitent ou pourraient inciter le paysan à planter des arbres et accroître son revenu.

Les grandes lignes pour chaque échantillon sont les suivantes :

- 1.1 Rôle de l'arbre dans l'alimentation humaine
- 1.2 Les arbres fourragers
- 1.3 Le combustible forestier
- 1.4 Relations entre l'arbre et le paysan
- 1.5 Influence du code forestier sur l'attitude du paysan
- 1.6 Rôle de l'arbre dans la pharmacopée
- 1.7 Comment utiliser au mieux les composantes du projet.

II. Instruments et procédure d'enquête

2.1 Echantillon

L'échantillon choisi couvre l'ensemble du paysage forestier national. Les personnes interrogées interviennent ou contrôlent ce paysage. Les différents fonctionnaires appartiennent aux administrations suivantes :

- Ministère de la Protection de la Nature :
✓ secteurs Eaux et Forêts
- Ministère du Développement Rural
✓ secteurs Ressources Animales
" Agriculture

2.2 Procédure d'enquête

Dans notre enquête nous avons utilisé un questionnaire dans lequel il est demandé de répondre aux items ci-joints (voir annexe III).

Les personnes interrogées sont à priori les chefs de secteurs puisque les informations recherchées sont relatives aux départements.

Dans certains cas l'Inspecteur ou son adjoint, ou l'adjoint au Chef de secteur a été sollicité pour suppléer le Chef de secteur absent.

Certains chefs de service ont invité l'ensemble de leur personnel à contribuer aux réponses pour pallier toute lacune. Par ailleurs nous avons interrogé certains habitants du terroir et nous nous sommes inspirés de certains ouvrages pour contrôler l'exactitude des noms de plantes concernées.

- "Flore du Sénégal" J. Berhaut Ed Clairafrique Dakar, 1970
 "L'arbre dans le paysage sénégalais" C.T.F.T Dakar, 1971
 "La pharmacopée sénégalaise traditionnelle,
 plantes médicinales et toxiques"
 J. Kerkaro et J. G Adam Vigot Frères Paris, 1974

Il est à souligner que l'éventail de la position hiérarchique des chefs de service rencontrés est assez large à savoir :

<u>Eaux et Forêts</u>	: Ingénieur des techniques forestières	ITF
	" des Eaux et Forêts	IEF
	" des travaux des Eaux & Forêts	ITEF
	" des travaux des Parcs Nationaux	ITPN
	Agent technique des Eaux & Forêts	ATEF
<u>Elevage</u>	: Docteur vétérinaire	Dr V
	Ingénieur des travaux de l'élevage	ITE
	Agent technique de l'élevage	ATE

Agriculture

: Ingénieur agronome

I.A

Ingénieur des travaux de l'agriculture ITA

Agent technique de l'agriculture ATA

Agent technique de l'horticulture ATH

2.3 Découpage géographique

Notre itinéraire a été modulé de manière à permettre au Coordinateur du Projet de contrôler le bon déroulement de l'enquête au cours de sa tournée dans les régions à la même période

Région de St-Louis

"	"	Louga
"	"	Kaolack
"	"	Ziguinchor
"	"	Kolda
"	"	Tambacounda
"	"	Fatick
"	"	Diourbel
"	"	Thiès
"	"	Dakar

Par le canal du réseau radio des Eaux et Forêts nous avons envoyé des messages pour signaler notre position et éventuellement recueillir au niveau du Projet des instructions au besoin.

2.4 Analyse et discussion

Il n'est certainement pas dans nos intentions d'analyser de manière exhaustive tous les résultats dans leur complexité. Mais il nous semble utile d'esquisser des remarques centrées autour de cinq (5) grands thèmes.

2.4.1 Alimentation humaine

Avant l'invention des plantes cultivées, l'alimentation humaine reposait essentiellement sur le ramassage et la cueillette. la forêt continue à demeurer un immense champ, où suivant les saisons on prélève feuilles, fruits, racines,

bulbe ou écorce. Nous avons recensé tous les produits qui offrent un intérêt économique pour la paysannerie.

De façon générale la commercialisation des produits est monopolisée par des Ouolofs aussi l'appellation des plantes est souvent en Oualof dans les marchés régionaux. Cependant la région de Kolda présente la particularité d'être dominée par deux ethnies mandingue et peulh. Nous avons donc jugé opportun de dresser les noms locaux des plantes en Mandingue et en Peulh.

2.4.2 Arbre fourragers

Ces arbres rapportent peu aux paysans. Les pasteurs conduisent les troupeaux dans la forêt afin qu'ils profitent du pâturage arboré, rejets et branches basses des légumineuses, gousses tombées à terre, produits d'émondage et d'élagage.

Dans les régions du sud le pâturage aérien n'est pas très consommé du fait de l'abondance du tapis herbacé.

2.4.3 Pharmacopée

Il serait fastidieux de citer dans ce rapport toutes les plantes forestières employées ou supposées efficaces en pharmacopée.

Les vertus curatives des feuilles, des racines et des écorces sont incontestables et font l'objet d'un grand courant de transaction commerciale.

On trouve des plantes et arbustes dotés de pouvoirs curatifs même dans les régions les moins boisées et celles comme la région de Dakar où la flore primitive a presque totalement disparue.

2.4.4 Le combustible forestier

Le Sénégal ne dispose actuellement d'aucune source d'énergie en dehors du combustible forestier et du gaz. Ceci explique que presque la totalité des ruraux et une très forte majorité des citoyens continuent à utiliser les produits forestiers pour la satisfaction des besoins ménagers.

Le marché du combustible est loin d'être négligeable mais il est surtout contrôlé par des exploitants qui généralement se soucient peu de régénérer les forêts.

2 4.5 Influence du code forestier sur l'attitude des paysans

Pratiquement tous les paysans ont une idée des dispositions du code forestier. Il serait cependant nécessaire d'intensifier les campagnes de sensibilisation et d'information par le canal des médias pour mieux éclairer le paysan sur les nuances de certains articles.

III Observations

3.1 Procédure d'enquête

Conformément aux termes de référence, les chefs de services des Eaux et Forêts, de l'Élevage et de l'Agriculture de chaque département ont été interrogés.

En plus une enquête dans les différents marchés régionaux a été réalisée. Au niveau de la région de Dakar, les marchés de Tilène (Dakar-Médina) et "Syndicat" (Pikine) ont été visités pour leur complémentarité.

Aucune pesanteur administrative n'a entravé le bon déroulement de l'enquête.

Ponctuellement les services d'un habitant du terroir ont été sollicités pour vérifier l'exactitude des noms locaux des plantes. Cette initiative nous a permis de dresser la liste des plantes en Soninké.

3.2 Le questionnaire

Certes les personnes interrogées se sont gracieusement prêtées à l'interview mais pour bon nombre d'entre-elles le nom scientifique des plantes a constitué une difficulté.

Par ailleurs sur l'ensemble des questions quelques unes n'ont pas eu de réponse satisfaisante.

Nous citerons :

- Les questions 5 et 6 relatives aux plantes médicinales alors qu'autour d'elles se trouve encore un certain secret.

- La question 14, relative à la superficie des "bois sacrés" n'a eu que des réponses approximatives. La visite des bois sacrés reste interdite. Seuls les initiés sont autorisés à y pénétrer sans risque et ils sont liés par le serment du secret. Il est donc impossible de déterminer de manière exacte le nombre de bois sacré ainsi que leur superficie.

- Les questions 28, 29, 30 et 31 autour desquelles nous avons demandé aux personnes interrogées de ne répondre que sur la base de l'ancien code forestier. Le nouveau code étant censé inexistant puisque non encore publié. Ces questions ont été aussi embarrassantes surtout pour les agents autres que ceux des Eaux et Forêts. C'est ainsi que certains fonctionnaires ont préféré ne pas se prononcer ou alors nous ont livré des réponses très vagues.

République du Sénégal

MINISTERE DE LA PROTECTION DE LA NATURE

Q U E S T I O N N A I R E

"LES PRODUITS DES ARBRES DES CHAMPS FAISANT L'OBJET
DE COURANT COMMERCIAL ET GENERANT DES REVENUS EN MILIEU RURAL"

DIRECTION DE LA CONSERVATION DES SOLS
ET DU REBOISEMENT

PROJET DE REBOISEMENT AU SENEGAL

685 - 0283

10, ROUTE DES MARISTES, HANN

D A K A R / - SENEGAL

1-/ REGION

2-/ DEPARTEMENT

3-/ ADMINISTRATION

4-/ PRENOM ET NOM DE LA PERSONNE ENQUETEE :

5-/ FONCTION :

6-/ POSITION HIERARCHIQUE DANS L'ADMINISTRATION :

7-/ DATE DE L'INTERVIEW :

- Début de l'interview

/___/___/ /___/___/ /___/___/

- fin de l'interview

/___/___/ /___/___/ /___/___/

8-/ PRENOM ET NOM DE L'ENQUETEUR :

1- Dans votre département, quels sont les arbres poussant dans les champs qui entrent dans l'alimentation humaine ?

Nom scientifique

Nom local

1. _____

2. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

13. _____

2- Quelle (s) partie (s) de l'arbre est (sont) utilisée (s) pour l'alimentation humaine ?

	<u>Arbres</u>	<u>Feuilles</u>	<u>Gousses</u>	<u>Ecorces</u>	<u>Fruits</u>	<u>Autres (à préciser)</u>
1.	/ /	/ /	/ /	/ /	/ /	/ /
2.	/ /	/ /	/ /	/ /	/ /	/ /
3.	/ /	/ /	/ /	/ /	/ /	/ /
4.	/ /	/ /	/ /	/ /	/ /	/ /
5.	/ /	/ /	/ /	/ /	/ /	/ /
6.	/ /	/ /	/ /	/ /	/ /	/ /
7.	/ /	/ /	/ /	/ /	/ /	/ /
8.	/ /	/ /	/ /	/ /	/ /	/ /
9.	/ /	/ /	/ /	/ /	/ /	/ /
10.	/ /	/ /	/ /	/ /	/ /	/ /

- 3- Parmi les arbres qui poussent dans les champs dans votre département, quels sont ceux qui sont utilisés pour l'alimentation du bétail ?

Nom scientifique

Nom local

1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____
9.	_____	_____
10.	_____	_____
11.	_____	_____
12.	_____	_____
13.	_____	_____
14.	_____	_____

4- Quelle partie (s) de l'arbre est (sont) utilisée (s) pour l'alimentation du bétail ?

	<u>Arbres</u>	<u>Feuilles</u>	<u>Gousses</u>	<u>Ecorces</u>	<u>Fruits</u>	<u>Autres (à préciser)</u>
1.	/ /	/ /	/ /	/ /	/ /	/ /
2.	/ /	/ /	/ /	/ /	/ /	/ /
3.	/ /	/ /	/ /	/ /	/ /	/ /
4.	/ /	/ /	/ /	/ /	/ /	/ /
5.	/ /	/ /	/ /	/ /	/ /	/ /
6.	/ /	/ /	/ /	/ /	/ /	/ /
7.	/ /	/ /	/ /	/ /	/ /	/ /
8.	/ /	/ /	/ /	/ /	/ /	/ /
9.	/ /	/ /	/ /	/ /	/ /	/ /
10.	/ /	/ /	/ /	/ /	/ /	/ /

5- Parmi les arbres cites dans la question 1. quels sont ceux qui sont utilises dans la médecine traditionnelle ?

Nom scientifique

Nom local

1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____
9.	_____	_____
10.	_____	_____
11.	_____	_____
12.	_____	_____
13.	_____	_____
14.	_____	_____

7- A quel autre usage ces arbres sont-ils employés ? (remplir le tableau de la page 11)

8- Parmi les arbres identifiés, citez ceux qui :

<u>Arbres</u>	<u>Poussent spontanément</u>	<u>Sont plantés</u>
_____	/_____/	/_____/
_____	/_____/	/_____/
_____	/_____/	/_____/
_____	/_____/	/_____/
_____	/_____/	/_____/
_____	/_____/	/_____/
_____	/_____/	/_____/
_____	/_____/	/_____/

9- Pour les arbres qui poussent spontanément, quels sont les soins apportés par les paysans ?

10- Pour les arbres plantés, quelles sont les sources de semences ou de plants ?

11- A votre connaissance, existe-t-il dans votre département des arbres remarquables au plan historique ou culturel ?

Oui / /

Non / /

16- Quels sont les circuits commerciaux utilisés :

- Voisinage

- Marchés locaux

- Intermédiaires

- Autres (à préciser).....

17- Parmi ces circuits de commercialisation, quel est selon vous, celui qui rapporte le plus au paysan ?

- Voisinage

- Marchés locaux

- Intermédiaires

- Autres (à préciser).....

18- Le circuit qui rapporte le plus au paysan commercialise-t-il des produits destinés à :

- La consommation humaine

- l'alimentation du bétail

- la fabrication de médicaments

- Autres (à préciser).....

19- Classez ces différents usages par ordre d'importance selon le revenu du paysan

1.

2.

3.

4.

20- Selon vous, quels sont les membres de la famille du paysan engagés dans la collecte des produits de l'arbre en vue de leur commercialisation ?

- paysan lui-même

/___/

- femme (s) de paysan

/___/

- enfants

/___/

- toute la famille

/___/

- autres (à préciser).....

21- Selon vous, quelle portion du revenu général du paysan provient de la commercialisation des produits de l'arbre ?

21- La vente de bois de chauffage constitue-t-elle une source importante de revenu pour le paysan ?

Oui / / Non / (spécifiez votre réponse)

22- Si non, quelles sont les possibilités selon vous, d'augmenter l'importance de la vente de bois de chauffage dans le revenu du paysan ?

23- Le paysan participe-t-il à la fabrication et à la commercialisation du charbon de bois ?

Oui / / Non /

25- Si oui, expliquez votre réponse

26- Si non, pensez-vous que le paysan peut être amené à planter des arbres destinés à la production de charbon de bois ?
(spécifiez votre réponse)

27- Selon vous, lesquels des facteurs suivants constituent des contraintes à la plantation d'arbres au niveau du paysan :

- faible source de revenus /___/
- indisponibilité de terre /___/
- indisponibilité de temps /___/
- indisponibilité de plants et de semences /___/
- faibles capacités techniques /___/
- indisponibilité de circuits de commercialisation /___/
- indisponibilité financière pour l'achat des intrants /___/
- défaut d'encadrement technique /___/
- attitude sociale négative /___/
- contrôle des prix /___/
- Réglementation forestière trop sévère /___/
- autres (à préciser)..... /___/

28- Selon vous, le paysan a-t-il une idée des dispositions du Code forestier ?

Oui Non

29- Si oui, quelles sont les dispositions du code qui incitent à la plantation d'arbres ?

30- Quelles sont celles qui constituent des contraintes pour la plantation d'arbres ?

31- Si non, comment pensez-vous que le paysan pourrait être informé des dispositions du Code forestier ?

32- Connaissez-vous les différentes composantes du projet de Reboisement du Sénégal ?

Oui Non

33- Si oui, comment pensez-vous utiliser les composantes du projet pour la réalisation des objectifs de votre service dans le département ?

34- Si non, comment pensez-vous que la Direction du Projet pourrait pallier cette lacune ?

- Séminaire d'information / /
- programme de formation en agro foresterie (courte durée) / /
- documentation technique / /
- autres (à préciser)

35- Avez-vous des suggestions à formuler sur les possibilités d'utilisation des produits de l'arbre pour l'accroissement du revenu du paysan dans votre département ?

36. Observations particulières (en lieu et place de l'enquête test)

ANNEX VIII. SUMMARY OF DATA IN TABULAR FORM

ANNEX VIII SUMMARY OF DATA IN TABULAR FORM

I. Question 1-2 Human Nutrition

Number of Species	64	mentioned
Leaves	28	
Pods	9	
Bark	15	
Fruit	49	
Sap	17	
Roots	7	
Flowers	1	

2. Question 3-4 Livestock Nutrition

Number of Species	40
Leaves	40
Pods	4
Fruit	18

3. Question 5-6 Pharmaceutical Uses

Number of Species	47
Leaves	38
Roots	28
Flowers	1
Seed	1
Sap	5
Oil	2
Bark	18
Pods	8
Fruits	27

4. Question 7 Other Uses of Trees

Number of Species	35
Firewood	140
Construction	116
Windbreaks	49
Honey	7
Rope	59

5. **Question 8** Spontaneous and Planted
Trees Yielding Tree Products

Number of Species	63
of which Planted	15

Regional Breakdown

Dakar	13
Diourbel	29
Fatick	30
Kaolack	30
Kolda	23
Louga	18
Saint-Louis	11
Tambacounda	22
Thiès	26
Ziguinchor	26

6. **Question 9** Care of Trees

No care	62
Some care	28
Protection	23
Pruning	5
Fencing	1

7. **Question 10** Source of Seed and Seedlings

No Knowledge	52
of whom Agriculture	19
Livestock	19
Forestry	14
of those who replied	38
Regional Nurseries of	
Forestry	32
Village Nurseries	6
Forest Research Center	2

8. **Question 11-12** Cultural Significance of Trees

Number Responding	48
Of whom agriculture	13
Livestock	16
Forestry	19
Number of Citations	54
Of which Animistic Cults	27
Gathering Places	16
Names of Villages	11

9. **Question 13-14** Sacred Groves N.A.

10. Question 15

Tree Species With
Marketed Products
Number of Species 45

Regional Breakdown

Dakar	8
Diourbel	19
Fatick	19
Kaolack	18
Kolda	20
Louga	13
Saint-Louis	10
Tambacounda	9
Thiès	17
Ziguinchor	19

11. Question 16-17

Marketing Channels	Available	Importance
Neighbors	32	4
Local markets	86	64
Intermediaries	60	41

12. Question 18

Relative importance of marketing
channels for Different
categories of Tree Products
Question misunderstood

13. Question 19

Relative importance of Different Categories of Tree
Products for Revenue

First Place		Second Place		Third Place	
Human Food	89	Animal Food	28	Animal Food	12
Animal Food	1	Medicine	13	Medicine	18
		Charcoal	6		
		Gum Arabic	2		
		Poles	1		

14. Question 20 Who gathers Tree Products For Sale

	Number of Citations
Men	35
Women	51
Children	39
Family	19

15. Question 21 (a)

Importance of Tree Products
For Revenue

	No answer	Important	Small	Vague
Agriculture	1	6	15	8
Livestock	3	9	10	8
Forestry	2	12	7	9
	-----	-----	-----	-----
	6	27	32	25

16. Question 21 (b)

Importance of Firewood
As A Source Of Revenue

Affirmative	48
Negative	40
No Reply	2

17. Question 22

Increased Revenue From Firewood

	Number of Citations
Relax Forestry Code	6
Cooperatives	15
Reforestation	6

18. Question 23

Farmer Participation in
Charcoal Manufacture

Affirmative	23
Negative	65

19. Question 25 N.A

20. Question 26 N.A

21. Question 27 Constraints To Planting Trees Citations

Lack of Technical understanding (Farmer)	31
Low Financial Return	30
Lack of Land	30
Lack of Time	30
Negative Attitude	28
Lack of Finance	22
Regulations	22
Supply of Seedlings	18
Marketing	18
Lack of Technical understanding (agent)	11
Price controls	2

22. Question 28

Farmers' Knowledge of Forestry Code	
Abstentions	8
Affirmative	36
Negative	46

23. Question 29 Incentives In Forestry Code To Planting Trees

0

24. Question 30

Constraints In Forestry Code To Planting Trees	
No Reply	66
Severity of Code and Regulations	24

25. Question 31

Diffusion of Information On Forestry Code	
No answer	43
Media	43
Revise Code	4

26. Question 32

Knowledge of SRP's Provisions

	No answer	Some Knowledge	No knowledge
Agricultur	1	24	5
Livestock	2	25	3
Forestry	0	12	18

26. Question 33.34 N.A

27. Question 35

Suggestions for Increasing Farm
Revenue with Tree Products

Suggestion	Number
Improved marketing Channels	15
Cooperatives	8
Direct Marketing	4
Choice of Species and Sites	14
More Extension	10
Cooperation among Agencies	6
Agroforestry	4
Forestry Code	3
Local Processing	2
Forest Fires	1

Explanation of Negative
Reply

	Number of Citations
Freely gathered	15
Sale Forbidden	4