



# Forestry Support Program

A Technical Assistance Program for AID's  
Forestry Development Activities

Review of

CILSS FORESTRY SECTOR

PROGRAM ANALYSIS PAPERS

By

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The opinions expressed by the author in this report are his own and do not reflect the policy of the government of the United States.

## ABBREVIATIONS USED

AID	U. S. Agency for International Development
AVV	Volta River Authority
CCCE	French Caisse Centrale
CFA	West African Franc: 50 CFA = 1 French Franc
CILSS	International Committee for drought relief in the Sahel (Cape Verde, Chad, The Gambia, Mali, Mauritania, Niger, Upper Volta and Senegal)
Club	Club du Sahel, donor organization with seat in Paris (OECD)
CRDI	Canadian Development Institute
CRS	Catholic Relief Services
EEC	European Economic Community (source of FED funds) European Dev. Fund
FAC	French government Foreign Assistance Agency
FAO	Food and Agricultural Organization of the United Nations (U.N.)
FDR	Rural development fund (Save the Children Foundation)
FM	Malian Franc: 2 M = 1 CFA
FNI	(Niger) National Investment Fund
MDR	Ministry of Rural Development
OECD	Organization of Economic Co-operation and Development, Paris
OICD	Office for International Co-operation and Development
OMVG	Gambia River Development Organization
PNUD	United Nation's Development Program (same thing as UNDP)
PVO	Private Voluntary Agency
TAD	Technical Assistance Division
UNSO	United Nation's Sahel-Sudanian Organization
USDA	United States Department of Agriculture
VITA	Volunteers for International Technical Assistance
YMCA	Young Men's Christian Association

## I. INTRODUCTION

This report has been prepared for USDA/OICD/TAD under Purchase Order Number 40-3148-3-00156 with intent to review a series of CILSS/CLUB forestry program analyses which have recently been prepared for several Sahelian countries.

In addition, it summarizes the results of the CILSS ecology/forestry technical meeting in Banjul, Gambia between October 18 and 23. A major point on the agenda was the discussion of these country reports. In addition, several other papers on past or future efforts in this sector were presented.

Based on these reports and the discussions which followed, the forestry program in the Sahel has been reviewed, present situation assessed and the limiting factors described. This paper summarizes the results.

In addition, recommendations are given how regional and country programs could be altered and what level and types of activities by other donors, CILSS countries and USAID would strengthen forestry/ecology sector activities in the future.

The idea of looking at what has been done so far in the Ecology-Forestry sector of CILSS was presented in a project proposal to the donors at the July, 1980 CLUB meeting in Paris. As a CILSS background paper honestly then pointed out: "up to now trees were planted, plantations managed and harvested without integrating these efforts into a comprehensive, overall plan".

The original proposal called for a systematic look at what has been done so far, what the needs and constraints are, what conclusions can be drawn and what criteria for future projects could be established to make future efforts more effective.

It was felt, in other words, that enough experience has been accumulating to:

- see what has been achieved,
- where we stand,
- what we have learned, and
- identify how donors, particularly AID could reach their general goals more effectively.

## II. SUMMARY

During the last seven years, donors have spend \$160 000 000 in the forestry/ecology sector. To review what has been accomplished and what lessons can be learned for the future, several donors have asked the CLUB and CILSS to analyse the situation in each of the CILSS countries (except Chad). The results were presented at a CILSS meeting in Banjul, the Gambia in October of 1982.

Although some encouraging progress at specific and isolated project sites has been made, the overall results have not met expectations.

Large-scale plantation costs are high; yields are much lower than predicted. Communal forestry efforts so far at least have not worked because benefits do not reach the population as planned. Existing laws and regulations, partly because of the way they are applied, discourage local farmers and herders to protect their soils and natural vegetation.

The basic problem is that Sahelian government agents generally do not recognize or are unable to face the fact that outside assistance could and should have been much more effective. Time (and money) is running short. Donors have become reluctant to commit the additional funds necessary to slow down expanding resource degradation across the Sahel.

False expectations (perhaps on both sides) have recently led to frustrations: cancellation of project funds and expulsion of expatriate technicians. The present trend can not change until Sahelians realize and admit that mistakes have been made in the way they insisted how projects should be managed. Their attitude of "We have the people, all we need are the means" has resulted in \$160 000 000 having been spent with simply not enough to show for. "Show me one good forestry project in the Sahel" has become the frustrating question posed by donor administrators and programmers that is difficult and embarrassing to answer. There are some but most of them are small and widely dispersed.

From those as well as others, concrete and specific conclusions can be derived on how to do better in the future.

Since the necessary changes will take time to develop, existing constraints on both donor and recipient sides require that future activities must concentrate on:

- keeping funding levels of individual projects relatively low
- working mainly through private voluntary organizations for field-projects (as opposed to resource inventory/planning efforts, education projects)
- discussing the underlying human and organizational problems (reasons for past, massive failures) among donors and with the Sahelians

- realizing that technical issues, at this point in time are less important than socio-political problems. Place more emphasis on assisting host-countries to resolve the real constraints; land and tree property rights, lack of individual incentive to protect or rehabilitate the environment, government agents' attitudes and motivation

### III. THE COUNTRY PROGRAM ANALYSES

Presently, six country analyses are available: Cape Verde, Gambia, Mali, Mauritania, Niger and Upper Volta. To this, the French funded Forestry Sector Analysis for Senegal can be added.

The individual country reports address present state of the forestry programs and contain recommendations for the future.

Most of them cover details on location, climate, soils and population well. Most, however, remain sketchy as far as the "lessons learned" aspects go and precious little is offered in terms of practical project design criteria. On the other hand, all recommend funding of additional (and some rejuvenated) programs and projects. Many focus on more institution-strengthening, training and research.

#### CILSS Overview

At the Banjul meeting, the CILSS Ecology-Forestry Unit handed out a regional summary based on the various reports.<sup>1</sup>

It contains an area wide overview of present and future consumption and demands for fuelwood; information which clears up many uncertainties and questions on how much is needed, where and when.

Total present annual consumption of wood for the CILSS countries (without Chad) is shown to be:

Fuelwood - urban and semiurban	3 000 000 tons
Fuelwood - rural	13 000 000 tons
Other (timber, poles, service wood, etc.)	<u>2 000 000 tons</u>
TOTAL	<u>18 000 000 tons<sup>2</sup></u>

= approximately 22 000 000 m<sup>3</sup>

1

Analyses completed: Gambia, Mali, Niger  
In draft form: Cape Verde, Upper Volta, Mauritania  
Special cases: Senegal (Separate Sector Plan available) and Chad (yet to be undertaken).

See Chapter VII for summaries of individual country reports.

2

$\frac{15\ 000\ 000 \times 1\ 000}{22\ 000\ 000 \times 365} = 1.99$  kg of fuelwood/pers/day. Varies from 0.08 in urban areas of Cape Verde to 3.7 in rural Gambia.

The CILSS summary, supported by additional data in the respective country reports, also provides production and consumption details by use-types, geographic regions, urban-rural sectors, and firewood-charcoal ratio.

Getting to the core of the problem, the report identifies a number of issues (and facts) which must be addressed before general resource degradation trends can be reversed more effectively:

- (1) "Woodcutting (for fuelwood or other purposes) is only one of many factors contributing to degradation. Agricultural expansion and uncontrolled fire are just as important. Protection measures therefore must include stabilization of agriculture and livestock activities."

Comment: The relative importance of woodcutting, compared to other causes of reducing the natural vegetation cover (overgrazing, agricultural expansion and fires) depends on the rain-fall zone. The important point is that even if all demands for fuelwood could be met tomorrow in a way that overcutting would no longer be necessary, further resource degradation would still occur because of these other factors.

"Stabilization of agriculture and livestock" means nothing less than "more rational" resource management (on a sustained yield basis). The report is correct, but the essential question is: how? Many donor projects have been trying to get things moving in this direction but progress has been slow, frustrating and very limited. Basic cultural values, attitudes and traditional beliefs are at stake and people can not be expected to adopt a more "rational" approach as long as they have no other options and as long as basic food and water are constantly in critically short supply.

- (2) "Forests and trees play a double role: production as well as conservation. In order to enhance the protective function of forests (and trees), other forms of energy will have to be developed complementing the woodsupply capacity of forests. This requires combined management and development of all available energy sources. While at some future date it may be economically feasible to transport firewood or charcoal over greater distances (the example Ivory Coast to Ouagadougou, is mentioned), there are already a number of sites today where conventional solutions concentrating on increasing firewood supplies alone can no longer be envisaged."

Comment: While these statements are basically correct (though it should be noted that the retail price of firewood in Abidjan at present is higher than in Ouagadougou!), it is frustrating to see that such general observations only now are beginning to surface. It should have been obvious before the last drought that forest, trees, natural vegetation in the Sahel have always played an integral part of the local people's existence and therefore can not be regarded as something apart. Yet, even today large bilateral and international donor organizations keep designing and implementing "forestry projects" as if they were located on extraterritorial islands (some on expropriated land!) separated from the rest of the land people are trying to survive on.

- (3) The report points out that (in general average terms) each family in the Sahel needs between 5 to 10 ha of natural forest to supply basic wood demands, mainly for fuel; less area would be required under more intensive care. The statement follows that this should be possible in a number of places.

Comment: The question is where? Village woodlot projects have run into serious problems along these lines: everyone agrees that trees should be planted, but reasonably productive land-as it turns out-is much more difficult to find than many outsiders assume. The need to grow food is forcing farmers all over the Sahel more and more to plant crops on land that is sub-marginal. True, there are places where trees can be planted, but these sites are normally so poor and unproductive that the results are (and have been) very discouraging.

- (4) Woodstoves: the report suggests the creation of a "Verification Center" (Bureau Veritas) to ascertain the technical validity of stove models before they are introduced on massive scales. This could be set-up on a regional basis.

Comment: As pointed out later (Section V), "improved woodstove" models have been disseminated that either have not worked or do not save the amounts of firewood claimed. "Too quickly conceived and introduced" is the term used in the report which, unfortunately, is quite correct. Besides, people seem to forget hard but basic arithmetics. Assume for instance that....

- a stove type is available that saves 30% of firewood, and
- 50% of all the households in a country use it,
- 70% of all the meals are cooked on these stoves (rainy season, different dishes, etc. will not permit this figure to be higher)
- 15% of wood burnt is for purposes other than cooking
- 50% of deforestation or desertification is due to overcutting for firewood....

the net-effect of introducing improved stoves on the environment, therefore, will be:

$$30\% \text{ of } 50\% \text{ of } 70\% \text{ of } (100-15)\% \text{ of } 50\%, \text{ or:}$$
$$0.30 \times 0.50 \times 0.70 \times 0.85 \times 0.50 = 0.044, \text{ or } \underline{\underline{4.4\%}}$$

- (5) While firewood shortage around large population centers-besides of considerable economic pressure on the people-is causing widespread deforestation, huge amounts of wood still go to waste in the countryside. Therefore it is recommended that improved techniques of charcoaling and reducing transport costs are considered as areas of future interventions.

Comment: This is a valid point. The maximum transport distance around the large town now averages about 100 km (on good roads!). Beyond, dead wood is laying around in many areas, interestingly enough also in the northern portions of some countries. Though some energy is lost in charcoal making, it seems better to accept some of these losses and use the rest, than not using any of the wood at all.

Transport costs could possibly be reduced by introducing cooperatives or organizing a better marketing system but the major bottleneck are not so much the transport costs themselves than a rather complex (and well controlled) market-organizations with many intermediaries and "franchises" held, by powerful forces.

- (6) One of the most important issues is covered under the title "better utilization of natural vegetation". The report states that for lack of management almost everywhere, natural vegetation produces next to nothing due to constant overgrazing and uncontrolled fires.

The people, according to the report, do not feel it is their responsibility, mainly because, under existing conditions, they have no economic interest in more rational utilization. Several remedies are suggested: allowing local people profit more directly from the products of national forest reserves, for instance. It is also pointed out how lack of official and legal recognition of individual (land) property rights eliminates all incentives for individual farmers to plant trees or better manage natural vegetation. While local participation is judged indispensable to proper conservation and management of natural resources (including trees and forests), government policies have not yet been adjusted. Therefore, there is no reason or desire on the part of private individuals at present to become more conservation-minded.

While motivation and incentives for local people to better preserve their land have been eliminated by various laws and texts, nationally managed forest reserves are abused, invaded and taken advantage of by the people for lack of action by government services on land under their jurisdiction.

Comment: The authors are to be congratulated for honestly and openly putting their finger on one of the most important and delicate problems. It is indeed deplorable that government action continues to discourage what traditional good sense and judgement once existed. More than one Sahelian country has adopted the stance that "all land belongs to the government" (except for the present and temporary surface use rights). No wonder, people have lost the reason, the right even, to care for their resource base. Meanwhile, efforts to "sensitize" and "animate" local people are carried out to "make them understand" that trees are important while at the same time fining them if they try to harvest trees they planted themselves on what they thought was their own land!

This is a major point of contention between donors and hostcountry governments. Donors have begun to pull back their interest (and resources) because they see that unless drastic changes are made by local governments, further funding of individual and communal forestry/conservation projects simply has no chance to succeed.

- (7) Another critical issue are service structures. The present low "absorption" capacity of government agencies is described by pointing to the fact that often 90% of agency's budget resources is "immobilized by salary payments". One of the remedies suggested calls for the creation of parastatal forest organizations which would operate and manage forest resources independently from other government structures (separate from general funds). Another suggestion proposes the creation, in each country, of a planning and socio-economic study-unit within each Forest Service in conjunction with establishing nationwide forest inventories.

Comment: While the limited absorption capacity of the respective services is a major management handicap and while receipts from forest resources could be better utilized if a separate fund would be established, it is difficult to justify that yet more bureaucratic structures be created requiring additional "infrastructure" (buildings, office equipment, etc.) while all that is really needed is another column in government receipt ledgers and a good dose of self-discipline to more equitably allocate public funds where top priorities are being declared, but not yet followed through with the necessary appropriations.

General Comment:

One key issue that the CILSS report does not cover, unfortunately, is a discussion of the people involved in the forestry and ecology sector: the local population, the host country government agents and the expatriate technicians, programmers and advisors.

As far as the local population is concerned, it is a cold, hard fact that trees or any other conservation efforts will not be maintained beyond the life of a foreign assistance project unless the local population takes an active part. This has been pointed out for years, is acknowledged in policy papers, reports, speeches and media releases throughout the Sahel. The reality in the field, however, is something entirely different. 95% or more of the ongoing efforts are still centrally planned, topdown executed and the local farmers and herders remain the involuntary recipients of most of the efforts and funds.

Hostcountry government agents, with some notable exceptions, still are firmly convinced that they are the key, the initiators and executives of anything that should and could be done improving the existing situation. Specific examples are abound. Some are cited in this text. As near as we can tell, it is a matter of beliefs and attitudes. Donor activities now span seven years of working with technical and administrative government agencies in an attempt to stem "desertification". It is no longer a few, isolated individualists (= troublemakers, to some) that keep

pointing to an urgent need for changes along these lines. Records (like the individual country analyses under review) slowly begin to accumulate, pointing to this critical stumbling block. More and more cases become known where in actual reality, things have gone astray because government agents simply were unable to recognize, conceive (or admit) that their attitudes have defeated the best intentioned assistance offered from the outside.

Identifying this problem as crucial is one thing, suggesting a practical solution another. To begin with, this issue should be brought out in the open and discussed with our colleagues in the Sahel. If need be, individual case-histories (with the name of the hostcountry benevolently removed) could be reviewed with each side giving it's viewpoint. Most of the conflicts are a matter of cross-cultural sensitivities. There is a lot of pride involved on the part of the Sahelians who will not easily admit they were wrong, if indeed they were! Cases now exist where donors concepts have contributed to desertification instead of combatting it. "We don't need outside experts to tell us how to plant a tree" is one side. The other obviously is "unless you change your attitudes and laws, we will no longer give you money".

Be that as it may, the problem is urgent: the Sahelians, during the Banjul meeting passed a resolution asking donors to "pursue and intensify their efforts...."

At the same time however, government laws and regulations, and frequently the way they are applied or enforced, are rapidly becoming the largest, single bottleneck of forestry/ecology efforts in the Sahel. This is not to say that the "technical package" is complete or could not stand considerable improvement. But, at present, even trees of highest quality, properly introduced at the right sites, for lack of local interest, stand only a small chance to bring about the changes for the better everyone is hoping for.

#### IV. REVIEW OF FORESTRY ASSISTANCE TO THE SAHEL

##### Public Agencies

According to a summary recently released by the Club, a total of \$ 7 458 000 000 in public assistance has been committed to the Sahel between 1975 and 1980 (all sectors).

Of this amount, 1.4% or roughly \$104 000 000 has been directed toward forestry and related efforts. The same source estimates that in 1981 another \$45 000 000 have become available to this sector. During 1982, preliminary estimates indicate another \$20 000 000 has been added, so that the combined post-drought public assistance effort for "forestry/ ecology" can be pegged at \$170 000 000.

This amount covers total obligations and commitments of which an estimated \$120 000 000 have actually been spent (end of 1982).

By 1980 the distribution by sources and recipient countries was as follows:

##### Sources:

IDA (World Bank)	22% (loans)
USA	20% (grants)
UNDP	15% (grants)
France	13% (loans and grants)
Germany	8% (grants)
Holland	7% (grants)
Switzerland	7% (grants)
EEC	4% (grants)
Belgium	2% (grants)
Others	2% (grants)

##### Recipient Countries:

Cape Verde	5%
Chad	3%
Gambia	4%
Mali	22%
Mauritania	3%
Niger	10%
Senegal	24%
Upper Volta	26%
Regional	3%

##### Non-government Agencies

In addition to public sector assistance, Private Voluntary Organizations have supported forestry and conservation activities. Less information is available on the exact amounts. US private organizations have been very active in this field. The list, by no means complete, includes CARE, Catholic Relief Services, Africare, Lutheran World Relief, Save the Children, Church World Services, VITA and the YMCA among others. Several European based PVOs also are active in this field: CARITAS, EUROACTON ACORD, OXFAM, EIRENE, Lutheran World Federation, World Council of Churches.

Only a rough estimate can be made of their total funding engagement. PVOs probably contributed at least another \$20 000 000 of non-government funds to forestry efforts. In addition, PVOs provided a considerable amount of technical assistance in the field which is not included in this figure.

Forestry/Conservation Components of Other Projects

Furthermore, a large number of development projects in the agricultural and, more generally, rural sector contain forestry or conservation components which are not counted as forestry activities per se. AID's Niamey Productivity Project in Niger (Village Woodlots), the SODESP Project in Senegal (Range Rehabilitation) or the World Bank's Maradi Productivity Project in Niger are examples. It is estimated that another \$40 000 000 have thus been provided to general forestry activities.

The sector-wide summary for the period of 1975 to 1982 therefore can be recapped as follows:

	In Million Dollars	
	Total Commitment	Actually spent by end of 1982
<u>Major forestry-conservation efforts</u>		
Public agencies	170	120
Non-government agencies	20	15
Forestry/conservation components of other rural development projects	40	25
TOTAL	230	160

## Difficulties of Analyzing Results

What have the \$160 000 000 produced in the eight Sahelian countries?

In terms of reforested surfaces, the various country reports unfortunately do not provide a uniform data base. Besides, the notion of "surfaces planted" contain a number of aspects that may give erroneous impressions:

1. Re-introducing Acacia albida, for example is often reported as reforestation efforts; planting trees in farm fields at a 10 x 10 m spacing is not reforesting, nor will these efforts contribute to the production of much firewood.
2. The direct seeding of run palms (Borassus aethiopum Mart.) frequently carried out in farming areas, as for instance 3 000 ha in Southern Niger seeded between 1979 and 1982, also is not really a "forestry" effort, though its contribution to re-establishing a balance in ecologic as well as economic terms is quite important.
3. Range rehabilitation efforts resulting in the natural regeneration of bush and tree vegetation (several projects in North Senegal), though not considered or reported as reforestation activities, play an important role in reconstituting natural cover and providing some wood.

Nevertheless, the extent of reforested areas where the primary objective is to produce more wood (mainly for fuel) can, on the basis of the various country reports, be estimated. Filling the gaps with personal observations and informal information received from Forest Service personnel and project technicians, it seems that since 1972 about 25 000 ha have been actually reforested across the Sahel. Perhaps as much as one third of these surfaces, as it turns out, unfortunately produce little if any wood. Early reforestation efforts by a UNDP in Southern Upper Volta for instance fall in this category. Much of the area is set on fire each year by local residents.

Some other planted forests yield so little (less than 1 m<sup>3</sup>/ha/year) that they cannot be counted either.

Furthermore, some of the reported surfaces include "Greenbelts" around major towns where harvesting for fuelwood is foregone in order to keep green spaces in tact.

Surfaces containing "Village woodlots" also turn out to be low or zero producers, mainly for lack of maintenance and benefits not flowing to the local people.

The effective area where reasonable forest production can be anticipated is therefore considerably below that normally quoted and not likely to be much over 20 000 ha.

Forestry and conservation efforts, of course, cover much more than fuelwood plantations. One of the major thrusts has recently been towards intensifying the management of stands of natural vegetation. Considerable work also is being carried out in soil and water conservation; Cape Verde, Upper Volta, Mali, Niger are examples. Range regeneration and management

efforts should be added to the list of accomplishments with encouraging results reported from Senegal (German and Canadian projects) and Niger (AID's Niger Range and Livestock project). Furthermore, dune fixation and sand stabilization efforts (Mauritania, Niger) have been carried out with considerable success. Under the new catchword of "Agroforestry", important progress in reintroducing food or fruit trees in farm fields has been made: Acacia albida planting and protection (Chad, Niger, Senegal), run palm (Niger), karite and nere (Niger and Upper Volta). Windbreaks and farm water conservation projects in Niger and Upper Volta also deserve mention in this context.

Improvements also cover such areas as "institution building": training, increasing planning capability, conducting resource inventories, as well as a number of studies. Considerable efforts have been spent on introducing conservation measures s.a. development of alternate energy sources and design and introduction of improved wood and charcoal stoves.

#### A Better Reporting System

Accomplishments under the general heading of "Forestry/Ecology" should be analyzed and listed by specific categories, in order to get a more accurate picture:

- 1.0 "industrial" plantations: large scale, government projects with primary emphasis on wood production.
- 2.0 communal forestry: village woodlots, communal forest management.
- 3.0 Management of natural vegetation:
  - 3.1 government forest reserves
  - 3.2 non-government blocks or stands of natural vegetation
- 4.0 Agroforestry: On-farm combination of growing trees for wood, food, forage or other tree or shrub products. Also, hedge rows, live fencing, windbreaks.
- 5.0 Soil and vegetation conservation efforts:
  - 5.1 watershed management schemes involving re-vegetation primarily to produce vegetation cover, improved runoff conditions.
  - 5.2 dune fixation and general sand stabilization purposes.
  - 5.3 Windbreaks
  - 5.4 Plantations for shade, green spaces, parks and green belts.
- 6.0 Other (Studies, inventories, training, management support, among others)

### Summary of Experience

Outside funding sources, in their early attempt to stem "desertification", generally responded by focusing on "tree planting". Relatively massive and quick actions were planned and carried out (UNDP, Germany, France, Worldbank, USAID, Belgium a.o.). Accents were placed, to begin with, almost entirely on national (government) reforestation efforts relying mainly on rapid growth exotics (eucalyptus, neem and - in the less arid areas - gmelina). Heavy equipment was used to clear land, declared off limits to everyone, of it's "useless" brush. Planting areas were fenced, sub-soiling done with heavy equipment and seedlings from nurseries were planted and protected using paid labor.

It soon became apparent that this approach had several serious drawbacks:

- establishing plantations were costlier than originally assumed. (Current inflation rates for this type of operation run around 15% per year) average costs now have climbed to about \$800/ha.

Kjell Christophersen, forest economist presently in Senegal (OMVG) has pointed out that under these conditions, approximately 12 m<sup>3</sup>/ha/yr would have to be produced to break even (zero net present value) under the following assumptions:

exchange rate: \$1 = 330 FCFA

stumpage value: 6 000 CFA/m<sup>3</sup> held constant

three cutting cycles: year 7, 14 and 21

extracting stumps, year 21: \$400/ha

Discount rate: 10%

Yields of this magnitude are only possible in the Southern most portions of the Sahel and only with softwood like gmelina who have about half the heating value of traditional firewood (Acacia scorpioides, Balanites aegyptiaca, etc.) and about 2/3 of other exotics like neem and eucalyptus.

NOTE: As pointed out five years ago ("Economic and Ecologic Criteria", introduction to and analysis of forestry projects in the Sahel, USAID/AFR/SDP), forest plantations in the Sahel, due to the limiting growing conditions, can not be expected to "pay for themselves" in purely financial terms. But as other experience has shown, properly designed and efficiently executed plantation efforts still should not be written off entirely. If proper species and genetic stock are used and if reforested land is correctly managed and harvested (See Chapter V. "Program Direction, Recommendations")

certain economic, tangible and measureable benefits can still result from future plantation efforts.

- Extensive maintenance efforts are needed to keep the trees alive. Fire, grazing animals and competition from weeds are the major problems. Continuous surveillance is necessary until trees can be cut. This protection costs about \$80 per ha per year until trees are harvested.
- Yields are much lower than predicted. The original estimates were based on relatively small, well maintained research plots. Actual figures now gradually emerge that are about half of the predicted levels: (3 m<sup>3</sup>/ha/yr at 900 mm, 5 m<sup>3</sup>/ha/yr around 1 100 mm).
- Benefits foregone by eliminating natural vegetation - as abused as it may have been - turn out to be much higher than originally calculated, if, indeed they were taken into consideration at all!
- Deprived of traditional uses of these areas, the near-by population has shown little or no interest in these government sponsored efforts. In fact, there often is open resentment which increases not only the need for protection and surveillance, but increases indirect social costs that are difficult to fully evaluate!

As a result, donors began to look for other ways to invest their forestry funds. From 1978 on, accents shifted to working more directly with individual communities. A new approach of "Village Woodlots" was introduced not without some resistance from various forest services (Gambia, for example).

First indications were quite encouraging. However, as times went on, serious difficulties began to crop up. While new techniques (relying on more modest, hand-labor oriented site preparation and planting methods) and a certain amount of voluntary unpaid local participation brought the initial planting costs down, it became apparent that adequate land for such efforts was much harder to find than originally anticipated. Many "unused" surfaces turned out to be either completely unsuitable for wood production or belonged to someone who did not want to cede traditional surface use rights to a common cause promulgated by government or expatriate project personnel.

The biggest problem, however has been occurring when trees were ready for harvest. Except in a few, noteworthy cases, the Forest Services carrying out these village woodlot efforts have not yet been able to successfully develop a model where the original intended beneficiaries (the local people who gave their land and did the work for free) actually receive the full benefits, or fruits of their labor. As well meaning and forthright (and there have been others!) as local government agents' intentions may have been, local people are not getting what they thought they had coming. Not surprisingly, they are not interested in major efforts like these and, generally, do not support them at all.

Furthermore, the dispersion of small woodlots over wide areas place a heavy burden on government services trying to provide basic administrative and management coverage. Funds needed to simply visit the various surfaces once in a while far exceed those field forestry agents presently have at their disposal. Even where vehicles were provided that still run, field agents seldom have the necessary fuel to make regular rounds.

What can be surmized from these "village woodlot" efforts is the following:

- The concept in itself is valid, but the need to give the local people a fair share for their investment cannot be short-circuited.
- Other than trying to grow species requiring more moisture than actually available at the sites, technical project execution is adequate. Although important improvements still could be made (cheaper planting stock, more effectively combining tree planting with soil conservation/watershed improvement, more emphasis on multiple use of the protected area), the basic techniques as applied today are viable and will give satisfactory results.
- The basic problem yet to be resolved is of socio-political nature and covers the following main point:
  - land must be carefully chosen so that its selection responds to local needs, is in line with soil and vegetation management patterns acceptable to (if not preferrable by) the local population, and has been cleared of all previous use-rights.
  - the protection of the trees must be carried out voluntarily by local residents themselves, for their own, future benefit.
  - the future benefits must be guaranteed by government to reach those to whom they were promised.

Donor technicians and project development personnel who have been watching the village woodlot movement evolve in the Sahel, presently find little encouragement. "Show me one that works" is difficult to answer simply because there are none (yet). There are quite a number of well stocked and healthy looking small woodlots in a number of CILSS countries. Looking behind the scenes however quickly reveals that most are actually "mini plantation" projects carried out, supervised and in all likelihood also will be harvested by government services. In some cases, "local participation" consisted simply of paying local residents wages for planting instead of bringing in workers from the outside!

On top of the generally dissatisfying results of large-scale government plantation projects, village woodlots do not seem to provide the hoped-for results either. What else then, can or could be done?

Searching for answers, donors have increased support of other aspects: One general approach some decided to concentrate on, is training. Overseas scholarships have been offered by several donors which, in the long run, certainly have some positive effects. An encouraging number of Sahelians presently are studying abroad. Other projects support or strengthen existing local technical training schools for mid- or low-level technicians (USAID in Upper Volta and Switzerland in Senegal are examples).

Along similar lines, a number of short term seminars and workshops have been sponsored by quite a few donors. They too will have some impact, although there are some serious constraints here also (See: USDA/Virginia Tech, July 1982 "CILSS Soil Conservation Seminar Final Impact Evaluation", Washington/Blacksburg).

The combined number of scholarships and seminars presently have reduced the number of forest service personnel available for field duty to such an extent that up to one third of one country's upper level technicians actually now are "in training" instead of on the job! (Algeria has recently agreed to train 20 Mauritanian forestry technicians).

Other donor efforts support adjacent areas:

Watershed management (Cape Verde)

Sand stabilization (Mauritania, Niger and Senegal)

Windbreaks (Niger and Senegal)

Soil Conservation (Cape Verde, Upper Volta and Niger)

Agroforestry including windbreaks and live fencing (Niger, Upper Volta and Mali)

Woodstoves (Senegal, Mauritania, Gambia, Upper Volta, Mali and Niger)

### Successful Methods

What methods have been successful? What has worked best, where and why?

- Not all large-scale government plantations should be written off as too expensive, anti-social or otherwise impractical:
  - In areas of more than 900 mm of rainfall, the right species on reasonable good sites do produce wood at satisfactory yields. Particularly where existing forest reserves can be upgraded, the closer to large population centers, the better, surfaces in blocks of 100 to 1 000 ha can be successfully reforested for the primary (preferrable not: sole) purpose of wood production. (Gambia, Upper Volta, for example)

- On more arid sites, local species, properly introduced and managed can also give satisfactory results.<sup>3</sup>
- Some village woodlots efforts show good promise to become successful "income generating" projects, provided they are well managed and the benefits go where they are supposed to as originally spelled out. (Senegal, Niger, Upper Volta, Mali)
- Long term academic training will, in the long run, make a positive impact. So do other training efforts of agency personnel as well as local people provided it concentrates on practical, field-oriented hands-on approaches.
- Sand stabilization (dune fixation) has been successfully carried out and recently developed techniques have reduced the level of outside financial support needed which should make these activities more attractive to donors. (Mauritania, Niger)
- Windbreaks and Acacia albida introduction are two "Agroforestry" type activities that conform well to locally perceived needs and have been successfully carried out with proven techniques at reasonable costs and relatively low risk. (Niger, Senegal, Chad). Especially the CARE windbreak project in Niger has given very encouraging results. So have Acacia albida efforts (CARE Chad, USAID Niger).
- Local soil conservation/planting efforts also have been quite successful especially where runoff erosion is a serious problem to local farmers. (Upper Volta, Mali, Cape Verde).
- Even in arid areas (200 to 400 mm), encouraging, initial results have been achieved by incorporating tree planting with grazing and improvements addressing basic, local needs (more forage, firewood, gum, etc.). (Senegal).
- Across the Sahel, more trees are raised than ever before. With assistance from many donor organizations and through different project efforts, the number of nurseries over the last ten years has greatly increased. Nursery techniques, in general, are satisfactory, at least more trees are being produced and a much greater variety of species is being grown (including an encouraging number of local food and forage trees). Nurseries also are spreading further into the back country. Different projects are creating "mini-nurseries" producing trees that are in great demand. National tree planting days or weeks are becoming common and more trees are being planted each year. What is very much needed now is more attention and care to adequate protection and maintenance. Planting a tree in the Sahel is one thing, keeping it alive during the next critical five years, another.

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German project in Northern Senegal. Also see Dave Gibbons: "The potential role of Acacia senegal in reforestation efforts in the Republic of Senegal".

V. ASSESSMENT OF THE PRESENT

The CILSS/CLUB reports furnish the much needed proof that there is more to combatting "desertification" than merely planting trees.

To some, the country reports will represent an across the board failure of forestry efforts in the Sahel. 160 million dollars have been spent for little over 20 000 ha of plantations that do not grow very well.

The number of trees established so far, compared to estimates of future demands is grossly inadequate.

But, stands of recently planted trees alone do not constitute the entire picture. Investments in resource inventories, planning, pilot activities, training and general conservation measures have brought about significant changes for the better. It is clear though that a tremendous amount of basic, hard work lies ahead.

Although exact information is lacking, reading between the lines of the various country texts and supplementing it with personal observation and knowledge of the area, it is time to point to the biggest, single forestry problem in the Sahel:

TWO OUT OF THREE TREES PLANTED NOW DIE OR ARE SEVERELY STUNNED BEFORE THEY REACH THE AGE OF FIVE.

Trees that are still alive are not growing very well. Re-establishing and caring for them certainly has not become the well established mass-movement that obviously is necessary before a lasting change for the better can take place.

Why, after spending \$160 000 000<sup>4</sup> are things still not happening the way they should? Judging from the lessons of the past is it worth spending more money if that is all we have gotten thus far? What is the problem?

The recent country program analyses contain more than enough hard facts to permit identification of the major limiting factors, even if some of the organizations and agencies involved may not like portions of the following obvious conclusions:

1. Few if any of the chosen approaches have solicited or encouraged local collaboration and participation. Projects have been conceived and are being carried out top-down, often disregarding the local people's strengths, creativity and wisdom not to mention their resources, cultural and natural heritage.

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of which, about \$48 000 000 are of US government origin, including Peace Corps, contributions to the Worldbank, UN agencies, and US PVOs, etc.

2. Most host-country implementing organizations' self images are those of agencies that are to apply laws which are inadequate, counter-productive and impossible to enforce regardless of how much repression and regimentation is used.
3. Many of the basic principles of project design are artificial, and in discord with local economic and ecologic realities or potentials.
4. Success expectations have been unrealistic. An obsession for too much too fast has often drowned-out approaches that otherwise may have succeeded.
5. The basic "technical package" has not been a limiting factor, although needs still exist to bring down production and maintenance costs and to increase yields. The basic problems as already pointed out are of socio-political nature.

This is what we have learned. Removal of these limiting factors is the key to the future and the basis for a new set of practical project design criteria.

It is easy to point to the need for a more people-oriented approach, to ask agencies to adopt more of a management and service oriented outlook, and to recommend that projects be more in tune with the area's ecologic dynamics, etc.

The real secret of success is in finding out how. It is extremely difficult to help rural residents of the Sahel to set good land aside for trees when their basic needs are for more food and more land to grow it on. It is perhaps even more difficult, especially from the outside, to advocate changes in laws dealing with such basic issues as land tenure, establishing private ownership or property rights where there are none. Imagine the US Forest Service being asked to originate use-permits (on a fee-basis) for berry-picking or taking pictures of a mountain lake!

Yet, the country program analyses, though different authors were involved, all make the same basic point;

- Host country implementing agencies must adopt a more people-oriented approach. Project designs must reflect this.
- Existing laws and regulations must be completely revamped to give local people more autonomy, more responsibility and more choices in managing their own surroundings.
- Future projects must be much more oriented toward the natural ecologic potential and dynamics of the environment. This means less ambitious "short-cuts", more reliance on local species and nature's own restoration potential.
- "Training" and "education" must be based much more on people's own resources and traditional know-how and stress human sciences aspects.

The trend which runs through these observations, common to all the country reports is that it depends first of all, how projects are matched with and blended into the present economic and social framework as it exists on the local scene.

### Technologies

As pointed out techniques of reforestation vegetation rehabilitation and resource conservation have advanced to a point where the "technical package" basically is in place. Practical experimentation is being carried out within many projects and a relatively close-knit network among forestry technicians provides the necessary informal but nevertheless effective communication.

The frequent, open contact between expatriate forestry technicians across the Sahel is encouraging. Mostly ad-hoc, the various technicians working in the Sahel keep in touch, more in spite of than because of international communication and collaboration on higher levels! The Club du Sahel secretariat is playing a key role not enough appreciated by many. More recently, key people at the Forestry Department of FAO also have joined the network; in addition links between U.S. technicians and "the French connection" as well as other European donors and technical support agencies are becoming stronger.

Progress in several technical areas includes:

- Nursery practices: Plastic pots are now widely used and although production costs still vary and are often high, consistent quality can now be expected and guaranteed throughout the Sahel provided a minimum of technical expertise is available at the individual sites. Future improvements should focus on the introduction of other containers, preferably biodegradable.
- Planting techniques. It is fair to state that we know how to plant a tree in the Sahel. What is still less established is that tree planting should be more effectively combined with proper soil conservation techniques (berms, terraces, minicatchments). Also many trees still die simply because they were sown too late in the nursery (too small) and then planted too late (missed more than half the rains). This seemingly unavoidable problem could be resolved by nothing more than proper advance-planning. But local project personnel and central planners still have a long way to go.
- Direct seeding. Good results have been achieved for years with Acacia senegal and Borassus. Experiments with many other local species continue and the results are as well as can be expected. Not every year is a good regeneration year. Much depends on uncontrollable factors such as rain and relative abundance of pests. The point often overlooked is that even if everything is done right, nature will determine success and failure of direct seeding from one year to the next. This technique also requires relatively large quantities of seeds which can by no means be taken for granted everywhere in the Sahel.

- Protection. The big problem: clearly not a matter of technique. If need be, brick walls can be placed around each tree. Obviously proper protection (along with weeding and eliminating fire hazards!) requires labor. To properly organize, supervise and control protection efforts requires a management effort or a self-help commitment on the part of the local people. Neither has been adequate. It's as simple as that and the point is well documented:

CARE report Chad, FRG project North Ferlo Senegal, Niger (Maggia windbreaks, USAID/PC A. albida project), Swiss Viblage woodlot project Upper Volta, etc.

- Genetic improvement. The NAS species trials have been successful insofar that in a number of areas (including Mouakchott!) trees were produced from the distributed seeds. They have been planted and are now being observed for their ability to survive. Large scale, sophisticated genetic improvements (cloning or tissue culture) are not yet practically feasible in the Sahel for a number of reasons. Specific, small scale and well controlled trials can and should be undertaken, though they will not qualify as "foreign assistance" as seen by Sahelians. What is more important and should be done, yet difficult to carry out, is that seeds should and can be collected and selected much more carefully in the future. The rule is simple: collect only seeds from healthy, vigorous, well formed parent trees. But to get everyone involved to do just that seems yet a long ways off!
- Practical, concrete techniques aimed at improving yields of traditional farm fields, the major problem in the Sahel, have been experimented with and are well enough known. Practically each country now has a site or two where someone has been finding out which soil and water conservation efforts work best, how to get local people involved, etc. The methods have been summarized in handbook form and additional work is under way.

### The Role of Expatriates

Finally, it seems that enough experience now has also been gathered to analyse and find out to what extent/expatriate "experts" and technicians were able to contribute to the cause.

Especially if the cost of airplane tickets, subsistence pay and "overhead" is added to the salaries and wages, millions of dollars have been spent on programming and technical assistance from abroad. How effective, how productive has this help been? Such an analysis should clearly distinguish between:

- administrators, programmers
- scientists, researchers, educators
- project implementation specialists, technicians
- "voluntary" contributors, including volunteers (U.S. Peace Corps, for instance)

Obviously previous experience and area knowledge is important. This, however has to be acquired first. Not nearly enough has been said about the important role Volunteer programs (like Peace Corps) has played along these lines. Most USAID forestry/ecology projects carried out today have former forestry (or wildlife) Peace Corps Volunteers on the US technical assistance staffs. Others are playing an important role as direct-hire personnel in various USAID missions in the Sahel and AID/Washington. Without their first introduction to the Sahel as PCVs, these people would not have the background and field experience everyone now relies upon. The role Peace Corps has played providing an introductory, learning phase of US personnel involved in this sector and in this particular part of the world deserves much more attention and consideration.

What also is less known: already before the drought, U.S. Peace Corps was involved in forestry programs across the Sahel: in Niger, for instance, continuously since 1963! This has established a solid base of experience and working relationships with host country agencies that has allowed the US and other donors to tap into when the needs suddenly arose. Without this volunteer element and the many Private Voluntary Agencies collaborating with these volunteers, progress would not be what it is today.

Project implementing and technical specialists, if an analysis were made, would get mixed reviews; some have received special awards from host countries, others were given 24 hours to leave. It certainly takes an unusual mixture of experience, attitude, ambition and patience to be effective. Moreover, as it turns out, a solid technical base is just a pre-requisite to deal with the now surfacing major stumbling blocks concentrated in humanistic, social and political-legal fields. Two hang-ups are particularly detrimental:

- (1) For lack of reference points in-country, technicians have an understandable tendency to transpose solutions which have worked elsewhere to the Sahel. While many basic elements and principles can indeed be applied, many of the details must first be re-designed and adapted to the situation at hand. This is not easy and requires an intimate knowledge of the local scene.
- (2) Frequently, less experienced technicians arrive with specific solutions in their mind. They then set forth looking for problems. This, of course makes them miss the basic issues and priorities and sets them up to spend most of their time on a wild goose chase.

If just these two points somehow could be rectified, technical assistance personnel that has come (and most of them left again!) would be a lot more effective.

Scientists, researchers and educators also have played an important role in developing forestry/ecology programs. While important contributions have been made, a lot of time and money has been wasted because the levels of inputs, too often, has been too advanced. For 90% of the people living in the Sahel the basic issue is survival. The assistance and help therefore has to be practical, direct and meaningful to those that need help the worst. While important, basic technical and scientific questions will require precise analysis/interpretation and sophisticated research, concrete action should

not be postponed until everything has been completely covered by studies and research. Example: soil erosion is a major problem in many areas. Therefore scientists have suggested that more research on soil losses, runoff, etc. be done. The practitioner in the field, trying to help farmers to keep things from getting worse, however simply does not see why he has to wait for additional scientific analysis and diagnostic synthesis before he can help a farmer plug gullies in his field with a load of rocks! In accordance with a field manual specifically written for the Sahels, to be sure.

Administrators and programmers face a difficult task in the Sahel. Under pressure to find ways to effectively "engage" often large sums of money against deadlines, many forestry/ecology projects were conceived (= designed) quickly and without considering that the local population also has a stake in development. Many of the design teams have gotten together with one or two Forest Service representatives to detail projects without more than a whirlwind tour through the project areas. The need to commit funds quickly and "efficiently" lead to turning over relatively large sums of money to local government agencies that were not possibly able to use this kind of money correctly. This has led to inefficiencies and badly coordinated actions with, in some cases, devastating results. In country X, a "village woodlot" effort costed over \$2 000/ha with some trees now growing on land owned exclusively by village chiefs. In country Y, first year survival rates in a village firewood project were 10% at best; survival was zero in a 60 ha woodlot. In another case, mean annual yields of an extensive plantation effort, according to the first observations, run around 0.5 m<sup>3</sup>/ha.

Part of this is due to the pressure foreign assistance programmers and administrators are under to produce "immediate, tangible" results. Another completely futile criteria is the "economic feasibility" of forestry/ecology activities in zones with less than 800 mm rainfall. Other conflicting criteria have been imposed on programmers: women, appropriate technology, private sector initiative, infrastructure development, etc. with accents shifting every two to four years.

If there is one sector in the development field that requires a steady, long-range oriented outlook it is natural resource management, particularly forestry and (resource) conservation. This does not mean that funds should not be spent judiciously and effectively. But it takes time for trees to grow and people to adopt different attitudes about their land. To administer this type of program takes a steady, long-range view that is often difficult to maintain in the rapidly changing atmosphere in which foreign assistance is asked to be effectively delivered.

#### Club and CILSS

A last point deserves to be added: Both Club du Sahel and CILSS have played a key role as clearing house and forum for important region wide exchanges on different levels: technical, administrative and political. Furthermore, discussion of programmatic issues, problems as well as solutions have been greatly facilitated by the Club and CILSS. The country reviews, analyzed by this paper are a good example. A number of meetings held between Sahelians and expatriates under Club/CILSS auspices, have helped to communicate and relate ideas, progress as well as delays and problems across the Sahel as well as among the many different donors. This has not been an easy task

for those involved, Sahelians and expatriates alike. It is difficult to imagine the cooperation and network that exists in the forestry/ecology sector today without such organizations as Club or CILSS. For all personal frustrations, discouragement and other difficulties the different people involved may have been exposed to, a great deal has been accomplished through these channels. As the country reports clearly indicate, the need for this kind of a communication base and forum is as great as ever!

Study of past success and failures shows that the difference between "good" and "bad" projects is not one of techniques<sup>5</sup>, nor is it a question of the type of intervention: large-scale plantation versus woodlots, agroforestry or soil conservation, for instance.

The common denominator of success is the way projects have been administered in the field, how the local population was approached and how project activities are being carried out so that local interest are stimulated and respected.

While this is being written and while effort on the ground continue, the problems of the limiting factors described above are becoming more severe. Donor-host country relations are becoming more tense. As donors become more aware of the nature of real constraints, they are beginning to press for more remedial action on the part of the governments involved. USAID has recently closed down (cancelled) a natural resource development project in one of the Sahelian countries. In another one, two expatriate project technicians have just been expelled from the project site, obviously for "pushing too hard".

Technical and administrative Host-country agencies feel they must retain control over what is being done where. They fear - as the political situation in neighboring non-CILSS countries proves - that unless they remain in direct control over how a nation's resources (land, forests, etc.) are to be managed, exploited or re-established, chaos would result. Donors, on the other hand, keep pressing for more local involvement. Neither side probably has all the right answers. While it is easy to look at past failures and point to mistakes made, simply suggesting what from the outside seems to be an obvious change for the better, indeed may cause

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NOTE: Considerable assistance in this field is needed, especially in regard to:

- Reducing nursery, planting maintenance and tree transportation costs, by identifying and introducing more cost-effective techniques.
- Improvement of planting material. Even such basic steps as more careful selection of planting material (seeds, cuttings) are not yet properly practiced.
- In addition a number of genetic and physiologic gains are likely to result from future research and experimental work: higher yielding varieties, benefits of soil bacteriae, pest and disease control are fields in which technical and scientific advances could lead to much better results.

additional problems. While project technicians were pressing for more local decision making power on access control to land (and freshly planted trees) in one area, open conflict broke out between farmers and herders near-by which resulted in serious injuries (and a casualty) of over a dozen local people (November, 1982). Is more local self-governing really the answer under such circumstances, which - in this case - has been a source of open clashes for generations?

If things are that complex and that difficult to resolve, is there anything that can be done? A hard look at the more successful projects provides some insight. Valuable clues can be found:

1. CARE Niger's Maggia windbreak project: In seven years, starting from scratch, 250 km of windbreaks have been installed in an important farming area for a total of less than \$1 000 000.
2. In a USAID/Africare project of the Thies and Kaolack regions in Senegal, "village woodlot" efforts are turning into a viable income generating activity for local rural communities: if protection against fires and animal continues for another year or two, valuable poles (for construction) can be harvested with returns going to local organizations.
3. Soil conservation and erosion control projects financed by various donors (including USAID) in the Cape Verde Islands have reclaimed a considerable amount of farmland and cut down erosion against great physical odds.
4. CARE, Chad and USAID, Niger efforts to re-introduce Acacia albida have had some noteworthy successes in terms of local acceptance and fast growth.
5. The Lutheran World Federation's dune stabilization project around Nouakchott, after several years of minimal success, is beginning to show good progress at much lower than original costs (from around \$4 000/ha down to around \$500/ha).
6. Over 3 000 ha of roniers (Borassus aethiopum) have been planted (seeded in place) in Southern Niger during the last four years. The project was started with French funds and is now continuing with Swiss assistance.
7. In Northern Senegal a series of efforts (first funded by Canada, USAID and now Germany) are producing the first results and signs of considerable local interest in re-establishing vegetation, including gum trees around degraded well sites. (Fulani have voluntarily planted trees)
8. Live fencing to replace the traditional dead-branch thorn barriers (zeribas) is being introduced and readily accepted by local farmers and gardeners in a Lutheran World Relief project in Niger's Sahelian zone.

9. Forest and natural resource inventory data is becoming available at increasing speed thanks to a series of efforts sponsored by various donors: USAID, French, German, Swiss, UNDP and UNSO. The Regional Center for Remote Sensing in Ouagadougou is now operational on a limited scale. Other regional facilities providing additional information are CIEH (Upper Volta), OMVS (Senegal) and, more recently OMVG. Country specific efforts also begin to pay off for instance with the USAID projects in Mali (PIRT).
10. A Swiss financed forestry school in Ziguinchor, Senegal is turning out mid and lower level forestry technicians of remarkable quality. Their training which includes a good dose of practical social and human relations skills is aimed at bringing about some much needed changes in attitudes and outlook of government field agents. The country's forest service chief's office is very appreciative of this.

What do these projects have in common? What separates them from the other, less successful ones?

#### Field Efforts

1. Expatriate field technicians working for Private Voluntary organizations and, in a few exceptional cases local government agents, provide an effective shield between the needs, incentives and potentials of the local population and a relatively insensitive, ineffective and often high-handed approach too frequently displayed by government technical agencies and their personnel.

#### Examples:

In country X, a local forestry agent imposed fines upon gardeners for pruning live-fence trees which they raised and planted themselves. Subsequent PVO rectified the problem!

Another forestry agent in the same country informed a PVO project technician that he had no right showing local residents how to raise their own seedlings; producing forest trees in nurseries could only be done by the forest service in their own nurseries (which in the previous year did not produce the planting stock that were requested for the Project!) Subsequent PVO intervention fixed this one, too.

In country Y, during a visit of expatriate project design people in a forest reserve, a local forest agent arrested a local farmer for cutting down a tree, took him along during a visit to a near-by village, made him squat down in front of him and then - for the benefit of the visitors - asked the hastily assembled

village elders what they thought the forest service could, in future, do more for them.

In country Z an education project designed to introduce practical field-work required more time be spent on hands-on training. The suggestion to reduce the military portion (weapons handling) in the syllabus to allow more field work was emphatically opposed by the host-country school director on the grounds that the future agents will have to learn how to defend themselves when dealing with the local population.

2. Funding levels should remain low enough to:
  - a. not exceed local agencies' "absorption" capacity. Managing available funds, personnel, equipment and time is a major problem for lack of previous experience. Too heavy an input will completely overwhelm those put in responsible charge. Materials, vehicles, fuel, etc., will be needlessly wasted and nothing will be learned from suddenly having an abundance of supplies.
  - b. not attract higher government level "sponges", as a very experienced and dedicated US technician once called it. Too large a funding package invariably will give rise to "needs" for above-standard buildings (housing for forest guards far more expensive than any other building in the village, country X), project vehicles being requisitioned by the minister at will (country Y), as well as other administrative requests for high priced office equipment, or excessive number of orderlies, errand boys and secretaries at headquarters.

### Training Efforts

3. Training efforts should concentrate on practical field work and include a significant portion (at least 25% of all available time and resources) of social and human relation skills. Students also should be rated (and eliminated) on their general attitudes toward work ("they don't have to work, and they know it")<sup>6</sup> and toward people ("no need to do extensive work in that area, people there already know very well what is forbidden").

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The present government service structure, based entirely on scholastic achievement levels, is demoralizing and counter productive.

### Planning Efforts

4. Efficient management of data gathering, analysis and planning activities requires considerable technical expertise and executive experience. Sophisticated technologies like computer programming/analysis, design of data storage and retrieval systems or satellite imagery interpretation have to be incorporated into a practical, well functioning system. Although it is most desirable from the beginning that host-country personnel is involved, past experience has proven that a number of Sahelian governments simply do not yet have the people with the necessary managerial experience and technical knowledge. Lesser skilled substitutes will not work, indeed are counter productive.

Host-country insistence on putting under-qualified local technicians in responsible operational charge of these kinds of activities, at least in three specific cases, has led to inefficient handling of project resources. The basic problem is that their supervisors do not or do not want to see these shortfalls. Donors, perhaps through frequent evaluation exercises, have no other choice but to make this point as openly and forcefully as necessary and to suggest that - temporarily - some of the work will be carried out by expatriate technicians until more experienced personnel is available, or else the waste will continue.

### Improved Stoves

A report (Les activites de l'equipe regionale "Foyers ameliores": Bilan et Perspectives") was presented at the Banjul meeting which shows that extensive work is presently underway introducing stoves of various designs into urban as well as rural households throughout the Sahel. Masons are being trained, extension work carried out and virtually hundreds of stoves have been built and are being introduced into individual households as well as into institutional settings such as dispensaries, schools, farmer training centers.

In spite of these efforts accompanied by a great amount of enthusiasm and optimism on the part of many promoters and donors, many of them Private Voluntary Organizations, the "acceptance rate" is not yet what it should be after all the efforts and the number of years spent. Improved stoves, to be sure, are being used in many places. It appears that practically each stove built, has been used at one time or another. In some areas, careful surveys have been conducted (some with assistance from Peace Corps) to record acceptance as well as problems that may have developed in maintenance and repair.

But it has been found that where women have a free choice to either continue to use these stoves or to go back to more traditional methods (more often than not: three rocks), in a majority of cases (according to field technicians s.a.: Ralph Royer in Niger or Susan Corbet in Upper Volta) the new stoves are being used for a while, a few months perhaps, but then abandoned in favor of the older methods.

One of the basic problems that still leaves much room for doubts is that no one yet has been able to determine how much, if any, these various new designs save on firewood.

As the Ki-Zerbo report points out (p.14)

"if there is one aspect where the Regional Team has not yet been able to live up to its expectations, though a great need for information exists, it's in regard to measuring the efficiency of the various prototypes in terms of firewood savings".

If we are still at the "prototype stage", and if we do not yet know how much they really save, is it not too early to have started the extension phase with hundreds of stoves already introduced that may actually not save any or not enough wood?

Another aspect raises some hard questions along these lines. A great number of different stove designs exist today. Quite frequently, each type is promoted by those who advance it as THE answer. It is not very likely that each of these designs is the best. Which one, then is the most fuel efficient? No one yet knows. The following page shows 16 different models and points out that these are only a few examples. Before more efforts are put into trying to persuade people into using any of them, someone needs to find out what the relative advantages and disadvantages of the different models are, fuel efficiency being one of them.

# Catalogue

## WOOD BURNING COOKSTOVES



India

HERL Chulah



Indonesia

Lorena  
Guatemala



Indonesia

Guitar Stove



USA

Bench Stove



Indonesia

Lorena-Indonesia



Senegal

Louga



Nigerian Stove



Indonesia

Katesan Stove



Indonesia

Singer-Indonesia



Mexico

Lorena-Mexico



Indonesia

Lorena



Nepal

New Nepali Chulo



India

Magan Chula



Upper Volta

Nouna



Upper Volta

Kaya



Upper Volta

Ghana-hybrid

## CHARCOAL BURNING STOVES



USA/Japan

Kamado Cooker



India

Sheet Metal Insulated Chula



Kenya

New Jiko



Thailand

Thai Bucket



Indonesia

Fired Clay Stove



India

Bucket Chulah

Mud-Coated



Refractory Stove

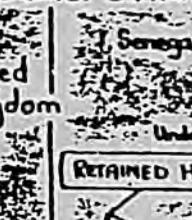


Reinforced Cement



United Kingdom

Wood Burning Stove



Senegal

Underground Cooker

## RETAINED HEAT COOKERS



Ireland

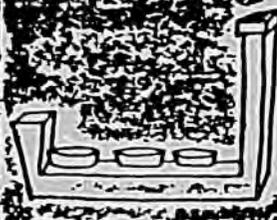
Haybox



Ghana

Smokeless Stove

## RICE HULL BURNING STOVES



Indonesia

Gula Java



Bali

Oil Drum



Java Rice Hull Stove



Burund

Peat Burning Stove

Details and contact people available from Cookstove News.

C O O K S T O V E N E W S

Generally, stove technicians, and donors in general are quite aware of the fact that stove efficiency "depends" on a lot of factors. Kinds of meals prepared, length of cooking time, uses of fire other than for cooking (light, heat, wash or bathwater, etc.), size of meals being prepared, time of the year, etc., all affect performance. It is partly these complexities that so far have prevented more definite answers to be available more rapidly.

It is also obvious that analysis in a laboratory under controlled conditions cannot do justice to what actually happens in the field. Besides, there are apparently considerable differences in the traditional use of fires (for cooking and other purposes) from one region to the next.

We know that the situation is very complex and that, under these circumstances, it is difficult to provide simple, straight forward, bottom-line answers. The improved stove enthusiasts project savings of up to 50%. It seems that it is up to them to prove their claims. Especially since experience in many different households throughout the Sahel has shown that for one reason or another these stoves are not as universally advantageous as they were thought to be. Otherwise people would have accepted them much more readily than they have.

Especially in view of the fact that acceptance is not what it was hoped for, it is disappointing to future donors not to at least know how much of an energy savings these stoves could represent.

Our own experience, for what it may be worth, is that the following points may contribute to the basic problem:

- Many improved stoves do not fit the practical needs of those who use them each day: can't stir right, can't use different size pots, pots are not at the right height, and so on.
- Most of them crack after a few months. This is seen as a blemish serious enough to abandon the installation even if it could still be used.
- Many new designs require smaller pieces of wood. This may mean so much additional work in chopping, that the model does not appear "useful" to the users in the long run, even if it has other advantages.
- Most of the construction materials used do not hold up during the rains, thus need repaired or protected by a roof. Besides, depending on the season, cooking fires may be built at different locations. Many of the improved stoves introduced in the Sahel are certainly not portable.

A report on fuel consumption of different improved stove models has recently been completed by the Renewable Energy Research Center in Dakar, Senegal with USAID funding. (March 1982) It represents one of the most comprehensive fuel use studies carried out so far. Actual wood or charcoal consumption was measured during the preparation of a total of 2 200 meals (19 villages or neighborhoods in a total of 87 families). Four different types of wood and three different types of charcoal stoves were tested. The

report concludes that between 30% and 40% of fuel can be saved. However the variations of consumption are great (in some cases actually more wood was used), the dimensions of the different stove types apparently were not always the same and the report does not give specific data on which of the types studied was the most efficient.

The paper shows that efforts in determining fuel efficiency of different models are being undertaken at present. However, the results reported thus far still do not answer the basic question: which model is the best and how much fuel can be saved through large-scale, successful introduction.

Another stove testing report, recently prepared is "Lab Tests of Fired Clay Stoves, The Economics of Improved Stoves, and Steady State Heat Loss from Massive Stoves", by Dr. Sam Baldwin, G. Yameogo and Issoufou Ouedrago, CILSS/VITA, November, 1982, Ouagadougou.

Tests of five different types of stoves identify one particular model where the PHU (Percent heat utilized) is above 35%, a significant improvement over more traditional models. In this case, information, collected under controlled lab conditions, is becoming available. These clay stoves, however are not the ones presently being disseminated on large scales across the Sahel.

#### Donor Project Management Capabilities

Certain shortfalls in project support among donor organizations in the past have impaired project development progress enough to make this one of the major limiting factors.

Beyond good will and money, proper implementation of forestry/ecology projects in the Sahel require a relatively large amount of attention to administrative and programmatic detail. It has been discovered that simply placing a qualified expatriate technician (Previous Sahel experience, fluent French, B.S. degree or preferably higher, willing to do extensive upcountry travel, etc.) is not sufficient to do all the nitty-gritty legwork that is required especially at the beginning of such projects. Unfortunately most host-country's ability (and in some cases even their willingness) to assist in such details as getting commodities through customs, setting up the required arrangements for money handling and budget control, providing local technicians sufficiently qualified to at least begin the work, etc., has been far below the level originally assumed (and promised). Foreseeing some of these problems during the design stage, many Proags have clearly defined the commitments expected of the host-countries. Many were never fulfilled. Yet, the donors are in an uncomfortable position in that they can not say much about these shortfalls because they, themselves, have been far slower than originally planned in ordering commodities, finding technicians and - worse - taking the original steps to get project activities underway.

Many of the larger donors (international as well as bilateral) have assumed, quite erroneously as it turns out, that once a project is "signed off", things will fall into place by themselves.

In the case of USAID, a separate chapter could address the way "contractors" (be they PSC, IQC or universities) are given the original impression how they will be able to operate essentially on the same basis as all other

mission personnel, but once on the scene find that their "support" is either non-existent, has turned into indifference or even open animosity on the part of direct-hire personnel.

Be all that as it may, improvements along these lines not likely to happen in the near future, donors should henceforth be much more cautious in assessing their own abilities to undertake implementation of future forestry/ecology projects. There is no use and little can be gained in cranking up projects that later can not be properly managed or followed through.

Some of the projects, at the stage they are actually in, would be better off, if they were cancelled (as one mission already did) with the hope that perhaps at some future date, when the personnel situation on both sides has improved, large or medium scale efforts in this sector could be resumed.

Until then, as experience and successes in the field now have proven, some of the funds could be funneled through other channels that at present are more efficient.

### Agroforestry

An overview of what has been accomplished to date shows that efforts carried out at local levels and in collaboration with rural residents have given better, more lasting results than large-scale plantation or woodlot efforts.

Agroforestry in the Sahel is certainly nothing new. In fact, it is precisely traditional agroforestry as actually practiced by the local farmers and herders that has kept things from being worse today than they have become where more ambitious modern development schemes in crop and livestock production have been carried out. As a NAS document, presently in preparation, will point out, there are half a dozen primary, local tree species which presently play a key role in retaining the ecologic balance in farm fields and on the open range throughout the Sahel.

In addition, outside donor efforts along these lines generally have found ready acceptance by the local people (sometimes less by host-country governments and their technical services!). Where inputs have been properly blended with local capabilities and limitations, notable success has been achieved with funding levels far below those expended by larger donors. Windbreaks, re-introducing Acacia albida, food/forage trees planted in farm fields, basic soil conservation techniques, dune stabilization, etc., all have been carried out in various countries without major problems or setbacks.

The level of these efforts may be called "insignificant" ("peanuts", by some). Yet they are certainly much better than the hundreds of acres of abandoned exotics plantations which burn every year now for lack of follow-through

"Agroforestry" efforts appear worth being expanded. Experience, however should caution potential donors not to view them as another bandwagon, breakthrough solution. The good that has been done so far can easily be

drowned by too much money and/or "discovery" by the development industry with the unavoidable call for a multitude of studies, more research and the uncoordinated and untested introduction of exotic species that have done well in Australia, Chile or the Sonora desert.

Details on what sensibly could and should be done can easily be developed by following what has been accomplished already. Not that improvements (including some technical ones) could not be made. But the accent will have to be placed on the (yet) existing weakest links which almost without exception deal with issues such as land-use and (tree) property rights, management autonomy of local natural resources, a more management and service oriented outlook of administrative and technical government agencies and social and economic "feasibilities" as seen by the local people.

A closer look at the situation in the field will reveal that it is often the expatriate advisors/ consultants, government officials and trained technicians that need "sensitized", "educated", "motivated" or "made aware of" the real needs, rather than the uneducated masses of the rural poor!

## VI. PROGRAM DIRECTION, RECOMMENDATIONS

Past activities in the general sector of forestry and ecology have shown that the need for more rational use of the natural resources in the Sahel is as great and as urgent as ever. In spite of all efforts undertaken thus far, over-use and abuse of the area's soil, water and vegetation continues. Agricultural expansion, for understandable reasons, causes more and more land to be exposed while yields of traditional farm soils continue to decline. Uncontrolled fires and, where animals are concentrated, overgrazing continue. The demand for wood (mainly for fuel) adds to pressures under which existing vegetation is reduced further and further.

With considerable assistance from the international donor community, host countries have, through a series of interventions, tried to reduce and reverse these trends. It is clear that, on balance, not enough has been done so far to make an appreciable difference. Too little, too dispersed and unable to provide the necessary economic and socio-political incentives to local farmers and herders, the \$160 000 000 spent thus far have not changed much.

However, encouraging results have been achieved here and there amidst generally disappointing results. Although large-scale plantations and communal forestry efforts have so far fallen short and in spite of the fact that the majorities of trees planted each year die before they are five years old, substantial, positive and encouraging results have been achieved at specific sites and under the right set of circumstances.

A review of the sector effort not only shows where mistakes were made and how they can be corrected, but what approaches and implementing modalities can lead to more effective ways forestry and ecology activities can be carried out.

The basic criteria which emerge are supported by experience gained in other parts of the world. So far at least, no shortcuts have been found. Three points are of critical importance:

- (1) The rural population must have a reason to protect and conserve their surroundings, trees, soil, water alike. Present regulations, administrative procedures and the way development has been carried out in the resource management sector more often than not has been counter-productive, incentive destroying, insensitive to socio-cultural realities and indifferent to the needs of people in the field.
- (2) The rural population must have alternatives and options allowing them to make the necessary adjustment and changes that are - in their views - sound in economic as well as social terms.

Basic necessities dictate that food must be produced, animals be fed and meals must be cooked, regardless of the negative impacts on the environment in the future. It seems to make sense, therefore to concentrate on increasing staple crop yields on traditional farmland (soil conservation measures, agroforestry), intensify

livestock management (forage production, feeding) and increase wood production (locally, on individual or communal basis). At the same time, economic incentives must be created (or allowed to develop) to render these activities feasible and more attractive to the local farmers or herders.

- (3) A fair and impartial view of forestry/ecology activities reveals also that considerable time and money has been spent - basically with good intentions and in the firm belief doing the right thing - on activities that were doomed to failure from the beginning because of the way projects were managed.

Evidence is accumulating indicating that many of the critical decisions by local forestry officials (Service Chiefs, their assistants, host country project directors, etc.) more often than not were made against the advice from expatriate technicians. The results now are there for everyone to see.

While insisting to be given operational project responsibility, Sahelian technicians in this sector frequently (and understandably) still do not yet have the basic planning, organizational and management experience required to make full use of the suddenly available funds and material. As result, the wrong species were chosen, nursery production was started too late, trees were planted too late, fences were not completed in time and maintenance and protection was not thought of until the damage was done. In addition, internal management control also was not nearly as tight and efficient as it should be: crews and vehicles are dispatched without planning. In a commendable spirit of doing things right construction standards (buildings, fences, etc.) are far above what would serve just as well and, as a result of all this, project funds are spent far above anticipated levels with outputs simply not meeting even modest expectations.

Unfortunately the problem does not stop there: many donors (not just U.S.!) have tried for years to point to these shortfalls and to work with host country agents trying to help them avoid repeating the same mistakes to this, the Sahelians often over-react. Someone must raise this problem. Here is where those from the outside still have not been able to convince the Sahelians they could and must do better.

While many donors, for many different reasons of their own, are very reluctant to take a firmer stand when things go wrong, they ultimately get discouraged and simply turn away. It may be native to say this, but it is quite possible that no one has yet told the Sahelians in these plain terms what is happening and why.

The outlook is not good and time is certainly not in favor of the host countries:

- little new money has gone into the forestry/ecology sector in the last few years.

- In one country, a forestry project was unilaterally closed by one donor.
- In another, two capable and committed expatriate forestry technicians were thrown out of the country for "interference", under the circumstances a questionable accusation and - certainly in the donor's view - an over-reaction.
- Three USAID forestry projects are presently being evaluated. In every one of them it will be obvious that progress is far behind schedule, in part because some of the host country key project personnel is reluctant (that is: not able or not willing) to get out of their defensive, outdated and self-protective shells.

If forestry/ecology efforts in the Sahel are ever to adequately address the increasing and urgent needs, some basic changes in this area must occur. Whether the CILSS analyses point this out or not, this is the focal point where things will either work or fall apart. As J.D. Keita (FAO) pointed out during a recess in the Banjul meeting: "After having worked together this long, we should be able to tell each other the truth".<sup>7</sup> Hopefully the much needed dialogue begins soon, before more time and money have been wasted. Once some of these obstacles are out of the way, work - once more - can begin.

Past experience shows how, donors can better assist the host countries in the future to achieve this. Time is needed to bring about the necessary administrative and attitudinal changes, the sooner the necessary means and guidelines are applied the better. What and how specifically can be done - in view of the lessons learned - is outlined in the following pages:

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Please see note on "Club and CILSS" in the Chapter "The Role of Expatriates".

A. "Strategy" (What)

1. In areas of rainfall under 1 000 mm, large scale plantations of exotic, evenaged monocultures, especially on land expropriated by host-country governments should no longer be supported.

Future efforts to provide fuelwood for large population centers should aim at improving existing forest reserves at critical locations (near larger towns, along transport routes, etc.) on a multiple-use basis and with due considerations to local species and still existing natural vegetation.

2. Village woodlots, development of communal forests and other small scale plantations: encourage field personnel of technical agencies to establish, manage and assist local population in creating their own source of forest production but only where governments from the onset agree that benefits, management decisions and responsibilities will be vested in local, traditional levels with "reasonably" equitable distribution of all future benefits (wood, grazing, food and other products).
3. Windbreaks, re-introducing Acacia albida (possibly together) and all other soil or vegetation conservation efforts carried out on local levels with the local population should be encouraged, supported and strengthened. This includes pilot activities in "management of existing natural vegetation".

The USAID/FAC Soil Conservation Seminar "Tech Sheets" (2nd edition in preparation by USDA and U. of Idaho) can serve as a guide on the various applicable and proven techniques. The major cause of "desertification" is the continuous decline of yields of traditional farm fields. Any activity that helps reconstitute farm soils (increase of organic matter, decrease of soil surface temperatures, etc.) should be given priority. Trees properly integrated can play an important double-role: conservation as well as (limited, well managed) production.

B. "Approach" (How)

1. Wherever possible work through Private Voluntary Organizations in the field.

Let them work with and for the people the way they know best. Ask that they report any difficulties with government agents and intervene immediately at mission Director or Ambassador levels when administrative or government "politics" block progress. If that does not solve the problem, pull out and tell everybody why.

2. Keep funding levels for individual projects at or slightly below local absorption capacity. This will have to be established experimentally, by trial and error. Provide no more than they can effectively handle. If problems occur, cut back. Experience (unfortunately) has conclusively shown that more than \$250 000

per year per project will result not only in waste, but unmet expectations, frustrations and - eventually - bad feelings all around.

3. Discuss points 1 and 2 with other donors and attempt to develop a common approach and the adoption of donor policies that are applied uniformly and consistently. Suggest and insist that during the next CILSS/CLUB donor meeting these points are included on the agenda and lay it out. The program analyses are now a matter of record. The facts are there and the conclusions obvious.
4. Supplemental studies, additional assistance: The majority of needs are in the social-political field. Laws need revised, government attitudes must change. No additional technology transfer can accomplish this. What is needed above all else is administrative, legal and management assistance. Additional information of the kind that has been provided in the past by political and social scientists must provide the foundation of any future inputs, including tree-planting and soil conservation projects. Additional assistance from legal and public administration specialists may help bringing about the needed changes.
5. Inventory, resource analysis and planning efforts are very important to move away from doing different things at different places regardless of priorities and local needs. Support of these efforts should be given a high priority, but USAID (and other donors) should insist on retaining the right to supervise and decide who is doing what, where and how.
6. A new type of government agent must be created where dedication to service and management can find its proper economic, social and humanistic rewards. Reorientation and training are needed which must deliberately focus on such a new outlook.
7. The need for ecologically sound management of the (still) existing resources is greater than ever. Funds and good will on the part of the donors (still) is available. But the time has come to make certain that inputs in the future go more directly and more efficiently to where the problems and eventually the solutions are: the local farmers and herders.

INDIVIDUAL COUNTRY REPORTSA. Cape Verde

The Cape Verde report clearly shows that this country differs from the rest of the CILSS region in many respects. One of the most dramatic differences are the low daily fuelwood consumption rates, which - for lack of supplies - do not exceed:

- 360 gm per person per day in rural areas
- 150 gm in semiurban locations of the less populated islands, and
- only 80 gm in the urban areas of Santiago and Sao Vicente.

The analysis suggests that a total of 53 000 ha of forests will have to be planted at a rate of 3 000/yr in which case fuelwood demands by year 2000 could be entirely covered provided wood is used to satisfy 25% of all urban and 100% of all rural needs. (Based on an eventual consumption rate of 1.40kg/pers/day).

Success of such an effort (comment: rather ambitious and optimistic) will depend - according to the paper - on:

- changes in existing forest laws
- a successful land reform
- "individualizing" the forest service
- (better) coordination of donor inputs, and
- technical improvements in energy saving stoves.

most of the tree planting the report suggests, should be carried out in connection with terracing efforts using eucalypts, pines, acacias, cypress, park insopia, and prosopis.

Plantation costs in the higher elevations (more rainfall) have varied between \$400 and \$500/ha. In the lower, drier locations costs average \$250/ha. (Comment: It appears that these costs cover planting and basic ground preparation only. Soil conservation efforts s.a. terracing or mini-catchments, frequently carried out in conjunction with tree planting efforts in Cape Verde may have to be added. It also appears, though the report does not give details, that the cost of food assistance involved in these operations is not included in the figures shown above.)

The biggest problems: indiscriminant cutting, goats, agricultural expansion (p.57) and (water) erosion.

At the root of present problems are counterproductive texts of laws and regulations: "(the present approach to) tree planting and protection has not lead to the hoped for results". This - in part - is due to the "many restrictions presently preventing individuals from getting benefits from their own trees". The report expresses the hope that things can and will be changed so that it is "no longer a violation to derive benefits from one's own trees".

In the ongoing Dutch financed forestry project at Santo Antao (MDR/SA/04/79) good cooperation between government personnel and the local people is reported; "open-minded attitudes" prevail and it is possible to try out new ideas. Yet, even these activities could be improved:

- government rural development policies are inadequate,
- there is no effective extension program,
- it is impossible to apply (existing) laws which do not meet present needs,
- land reform is difficult to carry out.

Along similar lines, the following observation is made (p. 129): "Fuelwood production under government auspices is not conducive to encourage local initiative".

#### Positive Aspects:

- A demonstrated will and commitment on the part of the government to overcome the present fuelwood shortage.
- A population willing to work and to work together with government field agents who are competent and well motivated.
- Between 1976 and 1981 a total of 8 500 ha have been planted. A substantial portion of these activities have been combined with soil conservation efforts.
- Donor inputs - according to the report - have been used efficiently.

#### Major Constraints:

- The Forest Service still does not have its own identity.
- Present forestry laws are not in tune with either reality or the overall program objectives.

#### Recommendations:

- Forestry components of watershed management and protection efforts should be completely integrated into local participation activities.
- Develop a legal framework and texts so they can become an effective tool in supporting national conservation and forestry policies.
- Find a management formula which will provide the local people with incentives (legal as well as economic) to actively take part in reforestation efforts.
- A very important technical suggestion (p. 139): in those watersheds that have already been subject to erosion control efforts, carry out soil conservation and stabilization work on agricultural land as well as forest areas. Where the upper reaches of a watershed are not protected, soil erosion will eventually destroy improvement work which has been done further downstream.

Comment:

Although Cape Verde is different from all other Sahelian countries, it is interesting to note that most "constraints" identified by this report are closely allied to problems identified in the others. The recommendations are valid but it seems that in order to carry them out, the host country government will have to initiate some basic and drastic changes in the way new land use measures are introduced. The basic management unit would be the individual watersheds under consideration. Forestry efforts would become an integral part of revegetation activities which - in turn - would be part of a more general resource conservation package that also would include conservation farming, range management, erosion control (surface as well as channel).

Experience in other parts of the world have conclusively proven that channel control and gully protection is shortlived if the upper reaches of the streams, indeed the entire parameter of the watershed, are not treated at the same time. The only way to protect installations downstream is to - first - stabilize and protect the headwaters. The Cape Verdian technicians as well as the expatriate advisors are well aware of this already. The basic problem remains how to include these principles in a project package acceptable to the local people and implementable by the host country agencies...after outside project support has ceased.

The call for changing the legal framework appears on target as well. Once again, however, the question is not so much what, but how? Local cultural values as well as government policies and agents' attitudes all have to change to efficiently fuse into a concept that everyone can live with. Much easier said than done.

B. Upper Volta

The following figures are of general interest:

- 43% of the country is covered by forests, or at least stands of some natural vegetation.
- 11% additional area (of a total of 274 000 km<sup>2</sup>) are park-type agricultural fields (agroforestry covered by nere (Parkia biglobosa) or karite (Butyrospermum parkii)).
- on these forested areas, the total average annual increment is estimated to be 0.22 m<sup>3</sup>/ha/yr.

Among to principal causes of deforestation, the report singles out:

- The notion of concentrating continuous economic development where most people live and access is easiest (= highest rate of return for inputs). Especially where economic aspects have been neglected, this has led to complete eradication of remaining natural vegetation in farmland. This type of improvement destroys natural vegetation forever.
- Traditional restrictions on unlimited land exploitation are pushed aside by government development efforts: "it is often difficult to listen at the same time to the agronomist and the (traditional) chief of the land".

- Existing land and forest laws are such that rural people no longer see themselves as the real owners of the land or the environment they live in. They no longer have the incentive to manage their traditional lands as responsible citizens.
- A strong case is made pointing to expansion of agriculture as the single largest factor responsible for deforestation. About 50 000 ha of natural vegetation disappear this way each year.

### Reforestation

So far a total of 12 500 ha have been reforested, country wide, of which about 900 ha are village or individual efforts.

Prior to 1970, a total of about 1 000 ha had been planted, with teak, cassia, neem and gmelina, mainly in the more humid portions of the country.

Since 1970 the following areas have been planted with assistance from various donors:

Israel and USAID	100 ha
Canada/Belgium	109 ha
PNUD/FAO	1 620 ha
Germany	4 800 ha
AVV	3 500 ha
FAC	136 + 700 ha (cashew)
AGECOP	180 ha
MFA	850 ha
Village woodlots:	
Switzerland, Holland, FDR, Africare, Oxfam, CRS, etc.	1 000 ha

In looking over the results of these efforts, the report makes the following points:

1. Although substantial surfaces have been planted, this is not nearly enough.
2. Success has been mixed: fire and choice of species ill adapted to specific site conditions are responsible for most of the disappointing results.
3. The Forest Service does not have the means to properly protect and manage these areas. (Comment: much less to intensify management of stands of natural vegetation.)
4. A table (p. 72) shows that over 2/3 of these efforts have produced less than 3 m<sup>3</sup>/ha/yr, with initial costs as high as \$800/ha.

Consumption

1.45 kg of firewood and 40 gm of charcoal per person per day. (Total population = 6 500 000). This is divided as follows:

- Urban fuelwood consumption (total 600 000 people) presently averaging in semi-urban areas (total 200 000 people) 1.80 kg and 10 g respectively.
- Rural areas (5.7 million): 2.15 kg per person. Practically no charcoal is used.
- To these figures fuelwood used by local traditional enterprises must be added which bring the nationwide, annual total to approximately 5 million tons.
- Firewood prices for Quagadougou are: 10 FCFA/kg wholesale and 18 FCFA retail.

Constraints

Among the main constraints opposing future forestry and ecology efforts, the two major ones, according to the report, are:

1. lack of staff and funds for research
2. laws which do not encourage conservation improvements on private farmland.

The overall situation is described as follows:

Encouraging aspects:

- The government is now acutely aware of forestry problems and has given them top priority.
- Foreign donors also are aware of the needs and are contributing substantial assistance.
- The present FAO/PNUD planning project "National Forest Resources" should furnish valuable information to better manage natural vegetation in the future.
- A better understanding and further studies of social aspects connected to forestry issues should resolve some of the more basic socioeconomic problems.

Of the many constraints and negative aspects listed, the following are then mentioned:

1. fire, over-grazing (especially the lopping of trees to provide browse for animals) and agricultural expansion are causing natural vegetation to further disappear.
2. The pressure on the national forest reserve has become extreme; some have recently been occupied by farmers and herders and should no longer be carried in the books.
3. The Forest Service - vis a vis these pressures - has, in the eye of the public, become a law enforcing agency restricting people, instead of being service and

ANNEX

-6-

development oriented. This has to be changed by all means if in the future positive and effective action is to take place (p. 72).

Predicted annual growth rates for well managed situations:

Natural vegetation (coppice rotation) 1 to 2 m<sup>3</sup>/yr/ha  
Government plantations:

Around Ouagadougou: 4 m<sup>3</sup>/yr/ha  
In SW of country: 8 m<sup>3</sup>/yr/ha  
Village plantations: 1.5 to 2 m<sup>3</sup>/yr/ha

The report points in several places to the first and foremost need to stem the negative influence of fire and grazing animals on regeneration (planted or natural): as long as these problems cannot be controlled, it will be illusionary to undertake forestry activities of any kind (p. 36).

At the base of all this, the report sees a primary need to change property laws and ownership rights pertaining to trees. The authors feel that the basic attitudes of people (farmers and herders) could be drastically changed for the better if they are given ownership and use rights of trees and forests that grow on their traditional land.

If they would acquire a personal interest in trees and forests with profits belonging to them, they could become more interested in conserving this resource for the future and take better care of it themselves (p. 95).

Comment:

Not enough accent has been placed on one of the most massive, earliest large-scale plantation failure lesson across the Sahel: The UNDP tree planting project South of Ouagadougou. Here it has been evident for years what to avoid in the future; the lessons have been clear. In fact, some of the adverse effects were predicted (privately, to be sure) by Upper Volta foresters assigned to the project when trees were planted in 1974. The major points:

- Do not let the host country government "provide" large tracts of land to a donor financed project without determining in the field what the local people think of the idea.
- No use uprooting established, natural vegetation producing fuelwood to plant (exotic) trees that produce little more wood than the original stands, and less of other, traditional forest products.
- When employing villagers as laborers, pay all wages as agreed upon. Do not simply abandon the project due to a "budget crisis" without honoring commitments made to people. This might reduce the amount of subsequent, accidental fires in the plantations.

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- If trees are introduced that are sensitive to fire, provide adequate funds for maintenance (eliminating grass cover) throughout the time they are expected to grow. Once outside inputs stop, the government will not have the means to continue upkeep. Chances are, the following year (and each year after) the stands will burn.

Upper Volta also contains one of the earliest large-scale "orthodox" fuelwood plantation (German project at Gonse). Here, after five years of growth, the best stands produced a mean annual yield of 3 m<sup>3</sup>/ha. This figure should be kept in mind when conducting future "economic feasibility" studies.

The report stated that "the government is now aware of forestry problems and has given them top priority". The ultimate proof is how much of its own funds the government is allocating to forestry/ecology activities, other than agents' salaries. I do not have this information, but would not be surprised if very little of the country's own resources actually are earmarked for this sector. Even if the amounts have doubled over the last few years, this still does not amount to much for such a "top priority".

The "better understanding of social aspects" is the key. Past experience of several donors with the Forest Service on this point is such that any change would certainly be a welcome surprise.

Fires in the South and overgrazing in the North remain the main problem. Unless something is done to control them, anything else (plantations, "management" of natural vegetation, etc.) will contribute little to alleviate the present ills; the report points this out clearly. What is lacking however are suggestions on how to go about it and where to begin.

### C. The Gambia

This report pegs present total wood consumption as determined by various earlier studies at a national average of 1.8 m<sup>3</sup> per person per year (90% used for fuel) roughly the equivalent of 3.7 kg/pers/yr, by far the highest consumption rate of all CILSS countries. Not only is this understandable (relatively abundant tree growth due to high average precipitation), but it points to an important trend in consumption patterns: the more abundant the supply of firewood, the more of it is used. Though very basic, this point is often overlooked in forecasts of future fuelwood demands.

In the case of the Gambia study, the "scenario to meet projected requirements" takes this into account an increase in wood scarcity (and higher prices) to a point where average consumption is projected to drop to around half of the present levels.

Among the largest pressures on forests and (other) natural vegetation, the following are mentioned: agricultural expansion<sup>8</sup>,

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which, according to a UNDP/OMVG report may more than double by 2000

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overcutting (not only for firewood, but also for fencing, roofing, food, poles and fodder) and uncontrolled fires.

An interesting detail deserves being mentioned: "the man-grove swamps are the only extensive area of virtually unexploited forest in the country" (p.6).

The report shows that forest resources are used for many purposes other than firewood: 11 different indigenous species are listed to show that "forests in The Gambia are an integral part of the life of the rural people .....".

Past reforestation efforts which began on a significant scale in 1961 so far cover 1 200 ha (98% in gmelina). Woodlots have recently been started on a pilot basis as part of the AID funded forestry project. Trees planted during the first year already have been set back by fire. Large scale planting efforts are planned under a West German Forest project.

Planting costs are given in an economic and financial analysis paper for the USAID Gambia Forestry Project which is shown in Volume III, p. 139. Initial establishment of the plantations were calculated at only \$350/ha (1979). As estimating basis, yields of 12 m<sup>3</sup>/yr/ha were assumed and 75% of the harvest was projected to be fuelwood.

In addition, extensive tree planting is taking place each year during the National tree planting festival, though considerable losses take place (tentative estimate: 50% first year survival rate).

Forestry's future in The Gambia has been outlined for the next government planning period (81-86): Plantations, village woodlots, yearly tree planting festivals, a forest inventory, research, demarkation of forest parks, forest product marketing efforts and training of professional cadres are the main points.

At present, however, only 0.67% of the government's total budget for recurrent expenditures is allocated to the Forestry Department, pointing clearly to the basic management, maintenance and protection problems which with the forestry agency is faced.

The report suggests that the currently planned planting program, if expanded to a total of 12 000 ha of "forest plantations" and 1 300 ha of village woodlots, will suffice to meet basic demands by 2000 provided protection (mainly against fires) can be achieved and consumption can be cut in half (hopefully by more fuel-efficient stoves).

In terms of lessons learned, the report is correct in stating that most efforts are of such recent origin that it is "too early to evaluate" (p. 63). There are - however - some observations that could be made at this point:

1. A recent UNSO sponsored study on fire problems in The Gambia revealed that the large majority of fires are started deliberately, some for "good" reasons, others in defiance to various government activities. Reducing forest fires therefore will

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be difficult and requires a number of "non-technical" approaches.

2. According to most recent Gambian forest service estimates, average yields of gmelina in plantations may not exceed  $10 \text{ m}^3/\text{yr}/\text{ha}$ . This reduction is partly based on several years of inadequate rainfall. (Comment: and overly optimistic expectations).
3. Gmelina wood has a relatively low density. It therefore is less than ideal as firewood (similar to cottonwood or poplar). Consumption records and estimates, however, are based on denser species, traditionally used as fuelwood.  $1 \text{ m}^3$  of gmelina wood will produce much less energy than  $1 \text{ m}^3$  of wood from indigenous trees. Satisfying demands based on hardwood will not be possible with equivalent volumes of softwood!
4. According to many Gambian authorities, deforestation (and with it serious soil depletion) is to a large extent due to agricultural expansion. Solving wood energy supply problems will - though reducing additional over-use - not reduce land-expansion pressures.

Comment:

Agricultural expansion and fires, often deliberate, are the main issues. At the basis are extensive political problems that donors can do little about from the outside. Their interest has recently focussed on fire control. If not placed on a popular, collaborative basis, efforts aimed at simply strengthening and reinforcing government fire control activities in the backcountry are futile if not counter-productive.

In view of increasing pressures on farmland, a country-wide land-use or resource management plan, based on local needs and priorities, has to be introduced before the situation can be improved by other, more specific interventions.

Present inventory efforts (USAID, FRG, and others) will serve as a first base to guide efforts toward more efficient management of the country's resource base.

D. Mali

An interesting reference point on forest volume in the wooded savannah zone is given in connection with large scale (total of 18 000 ha) clear-cut exploitation for firewood used by the railroad during WW II: average production 35 steres/ha, 1 ton of wood produced between 2.7 and 4 steres, and 14 steres were converted into 1 ton of charcoal.

Using a reasonable dry wood density of  $700 \text{ kg}/\text{m}^3$  and an average stere weight of 300 kg, the amount of standing volume would amount to about  $20 \text{ m}^3/\text{ha}$ .

Since relatively dense stands were singled out for this operation, country-wide averages are considerably lower. The report contains the following indicators for average conditions of natural vegetation (exclusive of farmed and fallow surfaces):

400 - 600 mm	volume: 3.9 m <sup>3</sup> /ha	potential yield: 0.13 m <sup>3</sup> /yr/ha
600 - 800	5.4	0.18
800 - 1 000	7.2	0.24
1 000 - 1 200	8.7	0.29 <sup>9</sup>

On this basis, potential production of the country's individual regions is calculated and compared to anticipated needs.

Need calculations are summarized which average, according to an FAO study, 1.9 kg/person/day. Other estimates are considerably lower (1.17 kg) which shows how difficult it is to get accurate data. Other wood products (construction, implements, etc.) probably add another 10-15% to the total needs.

The report then gives a detailed list of forest-tree foods (fruit, leaves, sprouts, sap) as well as tertiary forest products used for roof thatch, fiber for ropes, tanning products, woven mats, kapok, gum, etc. Retain prices reported in Bamako (October, 1981) are 25 FM/kg for firewood and above 100 FM/kg for charcoal.

A complete review of past activities, mainly reforestation efforts is shown. With the creation of a National Forest Service in 1931, a series of tree planting activities have been undertaken (first species: Khay senegalensis, Pterocarpus erinaceus, nere, mangoes and teak) which - all in all - covered several thousand hectares. Among the most interesting conclusions and lessons learned:

- a drought in 1950 destroyed all plantations in the Bandiagara area.
- Borassus aethiopum have suffered fire damage. Where they are protected, their recovery capacity is surprisingly great.
- Consistent failures occurred everywhere except in those instances where farming activities were carried out between the freshly planted Borassus aethiopum.
- Direct seeding of Acacia senegal has been very successful. Relatively deep (10 cm) pockets have given good results but rainfall has to be favorable.
- Gmelina can be proposed as principal reforestation species but only where rainfall is less than 900 mm.
- Basic success of planting efforts depend on:
  - locally adapted methods of adequate soil preparation,

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Comment: projected yields of natural vegetation in the higher rainfall areas seem quite low. Much depends, however to what extent these stands have been abused in the past.

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- healthy, well developed nursery stock,
- proper, consistent weeding which is extremely important immediately after planting. All water must be available to the trees, competition is fierce. This also greatly reduced subsequent fire hazards.
- Livestock production efforts are prone to lead to catastrophies (p. 67) unless numbers are kept at levels not exceeding actual range productivity including unusual dry seasons and years.
- Reforestation efforts may alleviate wood shortages but they will not replace the many uses people get from stands of natural vegetation.

The report underlines the extremely low operation budget available to the Forest Service which fluctuates between only \$4 000 - \$8 000/ year for the entire country!

An informative section deals with property and forest laws. From the first protective regulations on record (protecting Acacia albida under Sekou Amadou of Macina in the 19th century) to modern texts, a historic summary is given. The existing forestry law does not get very high marks:

- it is difficult to apply.
- traditional laws are often ignored.
- it does not take into consideration the rangeland character of a substantial part of the country.
- it is ill adapted to social structures and actual use people derive from forests.
- it is more repressive than preventive or educational and the mechanics of settling legal disputes are questionable.
- the people in the rural areas are generally unaware of it. The most they see in it is a setup for levying a series of fines.

The series of criteria and recommendations follow in regard to a new national policy on natural renewable resources. The main points are a need toward a more management oriented approach, better adhesion to social and cultural patterns, acceptance and adherence by government administration and a long-range view.

A description on on-going projects covers:

1. Management of forest reserves near Bamako  
1st phase FAC 1972-1975  
2nd phase USAID, CCCE and FAC 1975-1980
2. Project "883/MLI"  
Continuation of forest management project (1980-1985): Worldbank, CCCE, FAC.
3. Forestry Project Sikasso area  
Started in 1977, Swiss government
4. Reforestation around Kayes  
1980-1986, Federal Republic of Germany

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5. Pilot village reforestation project Fama-Koulikoro (1981-1984), 80% loan CCCE, 20% grant FAC
6. Village woodlots Mopti-Bandiagara (1980-1985) USAID  
The report notes that Albizzia lebbek, Cassia siamea, gmelina and casuarina, karite and neru may not be successful in areas of 400-600 mm mean annual precipitation.
7. Wildlife Management (Research) Holland
8. Wood technology center at Katibougou 1973-1977 Canada (C.R.D.I.)
9. Natural Resource Inventory (Southern portion of Mali) (1979-1982) USAID.  
Does not cover forest aspects
10. Wood salvage of Selingue dam impoundment area (1978-1981?) EEC. Very limited success.

A summary of 20 future projects are listed for which approximately 13 600 000 000 MF (!) or \$19 000 000 of exterior funding would be required.

Situation Analysis

Negative aspects:

1. The total forested surface is still not known.
2. Deterioration of natural vegetative ground cover continues especially around towns, in agricultural areas, in forest reserves and where fires continue to be set.
3. Reforestation efforts so far have been insignificant and costly.
4. Livestock and expanding agricultural pressures continue to grow. Much natural vegetation is cleared each year.

Positive aspects (only the most important are summarized here):

1. The southern portion receives enough rain, forest management and regeneration efforts to have a chance to succeed.
2. Mali has a fair hydro-electric potential which eventually may be able to reduce pressure on wood for energy, at least in part.
3. In some areas, forest inventory data is becoming available. (Swiss and AID projects)
4. In some parts of the country, significant, relatively intact forested surfaces are still available.

5. Techniques of reforestation have been developed, especially in areas of over 600 mm rainfall.

Comment:

This report has the most complete list of "lessons learned" of any. Also its situation analysis is thorough and to the point. Unfortunately the authors did not prescribe specific criteria to guide future design efforts. Instead, the report lists 20 future projects without indicating how past experience and lessons learned could make programming and project development more effective in the future.

It appears that Mali has significant areas of relatively intact forest surfaces left. This is a unique situation for the entire Sahel and one that donors should concentrate on more. If "natural vegetation management" still has a working basis to start with, this seems to be the area.

As in the other country reports, this one points to the urgent need to change existing forestry laws. The most salient comment that describes the situation far beyond Mali:

- ill adapted to social structures and actual use people derive from forests.

E. Mauritania

According to the CILSS summary report submitted at the forestry-ecology Banjul meeting, deterioration of renewable natural resources (mainly natural vegetation and soils) has become so serious and wide-spread during the last ten years that "gigantic" efforts of the entire population are required. Anti-desertification activities have been recognized as absolute necessity by the highest government levels. Some activities have been started but they will need to be coordinated through overall program, a step for which the CILSS/CLUB program analysis will provide the basis.

Little data is available on consumption and supplies of fuelwood (firewood and charcoal). Figures for available pasture and crop land do not include the recent effects of degradation, nor do they reflect the adverse trends of the last few years where rainfall (again in 1982!) has been below average.

The forest reserves located along the Senegal River, which provide the only (potentially) productive stands of trees the country has, will be seriously affected by the change of water regime in the river once the dams have been built.

Outside of this area the greatest portion of forest reserves exists today "in name only". Presently cited figures on consumption and still available "forest" resources indicate that in another 5 to 10 years there will be no trees or shrubs left in Mauritania the authors of the report find difficult to accept.

Obviously there are more trees and wood growing in the country-side (outside the government's reserves). How much is anybody's guess. At one time there were hopes that the USAID "Renewable Resource" project would provide at least an estimate. This has become highly improbable. The project actually is being cancelled.

The report, in spite lacking data, makes the (carefully considered) assumption that present and future demands in rural areas can continue to be met by "what is out there" particularly if fuel efficient stoves can be introduced.

However, it will be virtually impossible to meet urban demands from the same sources. Importing charcoal seems to be the only answer unless other energy sources become more readily available, fuel oil, bottle-gas or agricultural residues.

The negative aspects mentioned by the analysis are numerous and serious:

- no overall resource management plan yet exists (for either forest production or livestock)
- in spite of a serious fuelwood shortage, charcoal is still by far the cheapest fuel: 5 times cheaper than firewood and twice as cheap as bottle gas.
- yet a large volume of dead wood (gum trees which died as a result of the drought) are still covering large areas and are, for lack of proper tools and cheap transportation, not harvested.
- between 20 000 and 100 000 ha of natural vegetation will be flooded by the Senegal river dams; most likely the wood lost will not be harvested before being inundated.
- even as recently as 1981, farmers along the river burned rice straw simply to get rid of it.

On the positive side, the following points are mentioned:

- a national desertification committee has been established to coordinate the various conservation and rehabilitation efforts.
- GIRM is moving toward increasing the mandates of the technical agencies in charge:
  - 2 services will be established, one to conserve forest and range, the other for reforestation and wildlife management.
  - research in forestry and range management are planned.
  - a new forestry law is being prepared increasing the surfaces of "protected perimeters" (conservation reserves) and the number of protected species. Also grazing rights on a permit basis inside forest reserves will be established. All future clearing of land henceforth will require a permit.
  - A national tree planting day will be held yearly (second Sunday in August).

One of the government's primary objectives for the rural sector is to encourage people to stay or return to their home areas.

In a second part, the report highlights the impressive natural regeneration capability which (still) exists in spite of droughts and trends of degradation. In the South of the country, by merely protecting a surface against fire and grazing, gum trees, Acacia

scorpioides and Bauhinia reticulata easily have re-established themselves.

Several activities in human resource development also have taken place already:

- Nursery technicians received additional training with assistance from Lutheran World Federation.
- Nursery supervisors were sent to Senegal for additional training and experience.
- The establishment of a savings-system aimed at live-stock owners has been proposed.
- Fire control, extension efforts and a vegetation analysis have been included in a new livestock project in the Southeast.
- By introducing a livestock forage component into irrigation development along the river, grazing pressure in existing reserves could be reduced but this will depend on interventions by SONADER.
- The anti-salinity dam at Diama will improve ground-water quality. This in turn will increase forest yields.
- A seminar on fuel efficient stoves has been held which included follow-up activities and extension efforts. OXFAM and Peace Corps will provide additional future inputs.
- A planning meeting on renewable energy has been held during which a gradual reduction of import duties on bottle gas were announced.
- A fund for the promotion of renewable energies has been set up, supplied from gasoline tax revenues.

Comment:

Another country where the government has been given "top priority" to forestry/ecology problems. Credit should be given to Mauritania for having taken the initiative to do something about it: their laws are presently being re-written. How much a step forward this will actually be, how much difference this will make in the interior of the country remains to be seen. But they at least are doing something about it!

The report points out that "no overall resource management plan yet exists". Donors should be careful not to belabor this point too critically. Where for instance are the "overall resource management plans" (or at least a nationwide policy on natural resources) in any of the industrialized nations? In some of the largest donor countries this still is a hotly debated issue and one can not expect the LDCs be farther ahead than some of the leading nations!

A number of planning activities, committees etc. have been formed giving the impression things are moving ahead. However on the practical field side, Mauritania has precious few outside funding sources interested in this sector and where they existed during the last few years, project administrative and management problems have recently become so great that some donors are now discouraged and frustrated.

F. Niger

The three volume report contains substantial background data and information including the physical environment of the country, future land needs for forestry and agriculture, forestry administration and training facilities.

The following extract provides some insight into the situation:

1. Planting costs, based on figures obtained from the Worldbank project, up to 1980 ran about \$630/ha including indirect costs (almost \$6 000/ha for irrigated forest plantations).

Comment: Lower revegetation costs have recently been reported for direct seeding of Borassus aethiopum: approximately \$90/ha according to the project technicians.

2. Between 1972 and 1979, approximately 2 500 ha have been planted countrywide. Exotics (neem and eucalypts) are estimated to yield a maximum of 3 m<sup>3</sup>/ha/yr.

Comment: Since the report was written, measurements of recently planted surfaces, however, seem to yield considerably less (personal communication from project staff, 1982).

3. One kg of firewood in Niamey in 1980 sold for 12.7 FCFA (approximately \$36/ton).
4. Mean consumption is 360 kg/person/year.
5. Forestry laws and regulations:
  - a. existing texts are often in conflict with traditional laws and use patterns.
  - b. texts are difficult to enforce.
6. Ongoing and some past projects are described:
  - a. Worldbank 1st phase (1978-1981)
  - b. USAID Forest and Land Use Planning (1980-1984)
  - c. Niamey Greenbelt (1976-1977 FAC)  
(1981-1983 UNSO)
  - d. Gum arabic stands (Eastern Niger)  
Worldbank (1975-1976)
  - e. Management of Borassus aethiopum stands  
FAC (1977-1981)  
Switzerland (1981-1984)
  - f. Strengthening of Forest Service  
West Germany (1978-1980)
  - g. Revegetation around wells  
Switzerland (1981-1984)
  - h. Acacia albida. FAC 1981-1985
  - i. Acacia albida. USAID/FNI 1974-1978
  - ↳ Bouza reforestation, including Maggia Windbreaks.  
CARE (1975-1982)

1. Other projects with forestry components:
  - Village woodlots near Zinder (CRDI)
  - Niamey Department (USAID)
  - Agricultural project Badeguicheri (EEC)
  - Livefencing Baleyara (CARE)

In discussing a number of new projects, the report points to the important role the USAID Forest and Land Use Planning project will play.

In terms of the overall situation the following negative aspects are mentioned:

- lack of information on location, composition and density of remaining stands of natural vegetation.
- great pressure on land for agriculture alone is jeopardizing the remaining natural vegetation.
- bush fires take a heavy toll on natural stands.
- constant and frequent rotation of field agents greatly reduce their effectiveness.
- the Niger Forest Service is understaffed and grossly underfunded. Yet, the techniques presently being applied have proven valid. On the other hand, in terms of soliciting the collaboration of the local population, a formula has yet to be developed.

Future efforts should focus on:

- Soil conservation
- Revegetation of Acacia albida

Estimates on presently available yields from wood resources are given by zones:

3	stere/ha/yr	700 - 900 mm
2.2	stere/ha/yr	500 - 700 mm
1.2	stere/ha/yr	300 - 500 mm

Success depends - above all else - on:

Local collaboration and participation. People's interest must first be developed. It is necessary that they begin to profit from future forestry activities.

Comment:

The report does point to some interesting lessons learned and notes some of the (otherwise) lesser known success stories.

It is interesting to note that one of the major recommendations is to place accents on re-introducing *Acacia albida*. Around 1972 USAID actively supported *Acacia albida* efforts but then AID/W withdrew its support rather abruptly because headquarter staff technicians were not convinced of the scientific/technical value of the measure. Something similar is presently occurring in connection with "Agroforestry" in the Sahel: we can observe in the field that the basic idea works, that it

is sound and very much appreciated and welcomed by the local population. But we do not yet have all the scientific answers to prove how and why it works. Instead of supporting projects on the basis that net effects as observed in the field are positive and letting it go at that, donor attitude is still non-committal: "We realize it works, but we do not know why, therefore we need more studies, more research before we can commit ourselves." It is easy to see why host countries are not satisfied with this answer.

The report emphasizes the need to develop local collaboration and participation. The fact the government agencies have been reluctant to commit themselves more along these lines is well known in the donor community and has curtailed assistance in this sector in the past. In addition, Niger has been particularly insistent that they have the personnel, that all they need are the means. This standoff attitude has already been discussed briefly by the donors at a meeting in Paris in 1980. Recent negotiating problems with more than one donor along similar lines have not made cooperation any easier. In the end, the host country decides what they want and how much to accept and under what terms. If, however as a result of their stand, relatively little assistance is coming their way, the reasons are clear and no one should be neither surprised nor disappointed!

#### G. Senegal

A French funded planning document for the entire forestry sector has been prepared which contains extensive data on physical parameters, management, production and consumption of the country's Forestry Sector. Strategies, major objectives and action plans are included and supported by extensive information and records.

The CILSS ecology - forestry team has summarized the basic points of this study in its overview report. The main findings are:

##### Consumption:

Fuelwood- 60% of the country's energy needs presently are met by forest products (wood and charcoal). In rural areas, wood is the only energy source (96%).

The tradition of relying on fuelwood is remarkably consistent throughout the country regardless of ethnic or social differences.

Systematic data gathering is still inadequate. Estimates therefore still are inaccurate. The consumption rates established so far are:

1.86 kg/person/day in rural areas

1.42 kg/person/day in urban areas

For 1980 this amounted to a national total of:

3. 800 000 t, or about 5 000 000 m<sup>3</sup>

Projections:

By 2000 fuelwood demands are projected to reach approximately 3 000 000 t for the rural areas and 2 200 000 t for the urban population for a total of 5 200 000 t, or 6. 500 000 m<sup>3</sup>.

Not counting imports (wood products, sawlogs, pulpwood, etc.) another 936 000 t (1 200 000 m<sup>3</sup>) will be needed for poles, sawlogs and speciality dimensions, so that the total demand by the year 2000 will be at least 6 000 000 t or 7 500 000 m<sup>3</sup>.

The report also estimates that agricultural expansion will continue at an annual pace of 60 000 ha. The areas affected are mostly located in bush savannah and tree steppe vegetation types. Areas of high forest productivity along the Senegal river will yield to expanding irrigation development. The resulting production-loss will be accentuated by higher delivery costs since substitute quantities of fuelwood will have to be transported over much greater distances.

In the eastern portion of the country, a reasonably good ecologic balance still exists. Agricultural expansion will focus on this area with people moving away from the peanut basin where pressures on land (over 50 people/km<sup>2</sup>) and farm soils are particularly great. The "agro-sylvo-pastoral balance" may easily be disturbed if uncontrolled agricultural colonization is allowed to take place (p. 52).

As trees and bushes constitute an important browse resource for the country's livestock, the forage production potential of the natural vegetation also is important. A recently completed range resource survey shows that:

- heavy overgrazing occurs in intensely farmed areas (Thies and Diourbel).
- some overgrazing takes place in the Sine-Saloum area and the Casamance.
- the grazing potential around Louga and in the Eastern part of the country is underutilized.
- along the river, periods of low rainfall are especially critical: within 10 km of the river heavy overgrazing takes place while further inland range resources go to waste for lack of watering points.

Potential Production Tendencies and Plans

The country-wide potential production at present is estimated to be 8 300 000 m<sup>3</sup>. Transport and distance are already a major problem. Over half of the forest potential is in the East and the South of the country while the greatest demands are in the Dakar-Diourbel-Thies area.

While (potential) production and consumption, at present, are still reasonably well balanced, serious nation-wide shortages seem inevitable in the future. By the year 2006, the following deficits are estimated:

total needs:	10 000 000 m <sup>3</sup>
natural forest yields:	6 200 000 m <sup>3</sup>
plantation yields:	600 000 m <sup>3</sup>
<u>shortfall:</u>	<u>3 290 000 m<sup>3</sup></u>

Improvement of this situation, presently faces the following constraints:

- the nature of ecosystems is such that they are rapidly disturbed by even moderate over-use.
- pressures on natural resources increase from all directions.
- the rural population has little interest and incentive in conservation and improvement of their natural resource base.
- present laws do not recognize individual land property rights. This discourages farmers from planting trees or managing natural vegetation stands (p. 103).
- existing laws do not give the rural development councils the authority to manage (use, harvest) forests. The forestry code does not define how benefits of local forestry improvements will be distributed.

Comment:

The situation in the forestry/ecology sector in Senegal is the most complex of all Sahelian countries. Assistance projects as well as Forest Service staffing (organization as well as level of experience and education) are more advanced and more sophisticated than anywhere else in the Sahel.

Not surprisingly some of the results and successes have been more positive and more direct than elsewhere.

Yet, the same basic problems are signaled in the regional summary:

- little interest of the rural population
- present laws do not recognize individual property rights
- uncertainty in regard to future benefits of local forestry improvements, etc.

One situation that will probably deteriorate without anyone being able to do much from the outside: in the eastern portion of the country, natural vegetation due to relatively low population densities is still moderately intact. However, agricultural expansion is increasing rapidly in this area. Unorganized expansion will undoubtedly raise havoc unless overall development and expansion guides are established and enforced. It is questionable if the country has the resources, the manpower or - for the matter the necessary strength and will - to introduce an efficient settlement policy in time.

Senegal, more than any other Sahelian country, also has a large wood and forest resource potential in its southern areas. More rational exploitation is a question of both regional planning and local resource management. Much can be done now to alleviate future problems, but it is again a question of applying proper planning and management quickly and decisively enough.

The northern areas of Senegal will be hurting for firewood and charcoal sooner than many expect. Continued pressure for charcoal (in both Mauritania and Senegal) is rapidly depleting the natural stands along the Senegal river. In addition, some experts feel that the river water regime will be changed enough by the construction of the OMVS dams that the remaining trees will disappear as well.

Furthermore, serious soil conservation problem exists in the area of the peanut basin. The combined effects of overfarming and increasing demographic pressure are reducing soil fertility levels to a point where traditional farm land has to be abandoned. Moreover, acute firewood shortages begin to be so great that people are being forced to cut more and more *A. albida* trees in their fields which provide the last protection of the soils! All in all it is conceivable that within the next ten to twenty years a "dustbowl" situation will develop with serious socio-economic consequences. Some positive, concrete and direct action could be undertaken now, the techniques are well enough known but the major issue is land-use planning, protective zoning and conservation requiring personnel and policy changes far in excess of what seems possible in the near future.

REFERENCE TEXTS

The following reports, made available through the Club du Sahel constitute the data base for this paper:

Country reports:

The Gambia, two volumes, February, 1981. Sahel D (81) 126

Le Niger, three volumes, August, 1981. Sahel D (81) 132

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